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NOISE-AUGMENTED ASSET PRICING MODELS:
EVIDENCE FROM THE GREATER CHINA STOCK MARKETS
DURING TWO MAJOR FINANCIAL CRISES

Lim Chee Ming

A thesis submitted in fulfillment of the requirements for the degree of Doctor of Philosophy in Business and Management

Nottingham University Business School

The University of Nottingham

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Finally, I wish to dedicate this thesis to my family members – mother, sisters, brother-in law, nephews and niece. I thank them for their prayers, understanding, patience and support throughout the project.

Above all, I thank God for His grace.

ABSTRACT

The main contribution of the thesis is the construction of noise-augmented asset pricing models. These models are the extension of Fama & French Three Factor Model (1992,1993) and subsequent improved version of Five Factor Model (2015), by adding a behavourial factor - investor sentiment (INVSENT). To the author's knowledge, this is one of the first attempts to quantitatively reconcile risk based theory and behavioral finance by developing parsimonious asset pricing models for explaining value premium phenomenon, especially in the context of financial crises.

Little research has been carried out on the value premium phenomenon over a short horizon during high volatility period. Previous empirical results show that over the long run, value stocks outperformed growth stocks, with considerable firm size effect. There are two competing schools of thoughts that explain the value premium phenomenon - risk based theories and behavior models. However, the occurrence of the Global Financial Crisis and Eurozone Crisis has opened a new and alternative window to study the value premium phenomenon and further examine the underlying reasoning.

Firstly, in examining the risk and return relationship of value stocks and growth stocks of the Greater China stock markets during the two major financial crises, it show that growth stocks outperformed value stocks during both the Global Financial Crisis and Euro Zone Crisis in the China and Hong Kong stock markets. However, value stocks outperformed the growth stocks in the Taiwan stock market during the Global Financial Crisis and Euro Zone Crisis. The small size effect did not really diminish in the Greater China stock markets during two major financial crises. Also, standard risk measures – standard deviation and Sharpe ratio do not fully explain the risk and return relationship of these two stock selection strategies. Secondly, in explaining value premium under the Banko, Conover and Jensen Model (2006), mixed results are observed. During the Global Financial Crisis, industry book-to-market ratio is a strong signal in the China and Hong Kong stock markets, whereas the firm book-to-market ratio is a strong signal in the Hong Kong and Taiwan stock markets. Further analysis at the industrial level has revealed that industry book-to-market ratio is a more prominent factor than the firm book-to-market ratio. During the Euro Zone Crisis, the firm level book-to-market ratio is significant the Hong Kong stock markets, even after controlling for market capitalisation and beta.The study under the Fama and French Three Factor Model (1992, 1993) has shown that the three risk measures - market risk premium (MRP) factor, SMB factor and HML factor are semi-strong signals in explaining value premium in the Greater China stock markets during the two major financial crises. Furthermore, the investigation under the Fama and French Five Factor Model (2015) has shed light that the five risk measures - market risk premium (MRP) factor, SMB factor, HML factor, profitability factor (RMW) and investment factor (CMA) are semi-strong signals.

Considering the values of adjusted R-squared and varying signals of the risk measures, it is argued that risk factors of the three asset pricing models do not fully explain value premium phenomenon in the Greater China stock markets during the two major financial crises.

Thirdly, the study under the noise-augmented capital asset pricing models reveals that the investor sentiment (INVSENT) factor is a statistically significant determinant of the stock returns in the Hong Kong stock markets during the Euro Zone Crisis. The investor sentiment (INVSENT) factor is only weakly significant or insignificant statistically in the China and Taiwan stock markets during these two financial crises. For the risk measures in the Fama and French's models, market risk premium (MRP) factor, SMB factor, HML factor, profitability factor (RMW) and investment factor (CMA) are semi-strong signals. The adjusted R-squared values of the noise-augmented asset pricing models are higher than the original Fama and French models.

The findings of this research are expected to provide a fresh insight to the investment managers in the asset allocation and portfolio management decision. The practical implication is that when investing during the period of financial crises, one has to firstly, be selectively in stocks and hence businesses involved, relying on the principles embodied in the risk based model – Fama and French Five Factor Model. Then, be aware of the mispricing caused by the investor sentiment. The mispricing may present opportunities for contrarian investment strategy.

Keywords: Noise-augmented asset pricing models; Financial Crises; Value Premium; Greater China; Fama and French three & five factor models.

DECLARATION

I declare that this thesis and the work presented in it are my own and have been generated by me as the result of my own original research.

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CHAPTER 1: INTRODUCTION

"Wall Street people learn nothing and forget everything."

Benjamin Graham

1.1 Motivation

This thesis addresses a number of important issues in the field of Empirical Finance. It aims to shed some lights on the value premium phenomenon, that is the performance of two major classifications of equities – growth and value stocks – at firm, market capitalisaton and market integration levels, during Global Financial Crisis 2007-2010 as well as Euro Zone Crisis 2009-2012 of the stock exchanges in the Greater China region. Secondly, it examines the possible underlying reasons from the perspective of traditional risk based models for explaining the value premium phenomenon during the two crises. Thirdly**,** it constructs noise-augmented asset pricing models. These models are the extension of Fama & French Three Factor Model (1992,1993) and subsequent improved version of Five Factor Model (2015). The noised- augmented asset pricing models are developed by adding a behavourial factor - investor sentiment (INVSENT) as a proxy for noise in behavioral finance.

Little research has been carried out on the value premium phenomenon over a short horizon during a period of high volatility. Although the study on the cross-section of equity returns is a major topic in asset pricings, where empirical works expanding from the developed markets to the more recent of emerging markets (Fama and French, 1988, 1992, 1993, 2012; Claessens, Dasgupta and Glen, 1998; Davis, Fama and French, 2000; Asness, Moskowitz and Pedersen, 2013) have provided evidences that equity returns are predictable, to some extent, especially in the long run, little is known about the discovery of the performance of value stocks and growth stocks during the period of financial crises, when the market is inefficient, given the occurrence of a financial crisis is a rare event.

Whilst on the one hand, previous works (Rosenberg, Reid and Lanstein, 1985; La Porta, Lakonishok, Shleifer and Vishny, 1997) have laid down the foundation on the critical issue of market efficiencies in the value stock performance, on the other hand, past research has concentrated on the cross section of equity returns in the long run so as to provide insights on the performance of two major classifications of stocks – growth and value stocks, based on certain common valuation indicators, namely book- to- market, earning- to- price, cash-to-price and dividend-to-price (Fama and French, 1998; Bauman, Conover and Miller, 2001; Cakici, Chan and Topyan, 2011).The vast majority of the findings discovered that over the long term horizon, the value stocks have consistently yielded a higher return than the growth stocks, with considerable firm size effect. (Banz, 1981; Reinganum, 1981).Consequently, we have an incomplete picture of the relationship between market efficiency and time horizon.

The ancient Chinese characters for 'crisis', at least 4,000 years old, are: 危机 (Wei Ji). The first of these characters translates as 'dangers' and the second translates as 'opportunities'. Hence, with this spirit, the argument of this thesis is that, with the occurrence of the financial crises, it is timely, perhaps even critical that we examine both the dangers and opportunities which made present in investing in the equities, subdivided into two major categories – value and growth stocks selection strategies.

The examination of the literature in financial economics has shown that two major schools of thoughts, which based on risk and behaviour models emerging as the major explanatory power of value premium phenomenon. Given the academic controversy of these two possible explanations, the question to ask is whether the debate on value premium and its explanations still have its relevance when equities were experiencing losses in the short to medium term with high volatility in the market.

In addition, the extent to which does noise effect influence the performance of the value and growth stocks on the background of global financial crisis also warrant a scholarly investigation. Value stocks, the high book-to-market equity firms, are generally argued to have greater risks of distress and hence, higher premium (Fama and French, 1992, 1993, 1996, 2012; Carhart, 1997). However, the mispricing argument presented evidence that firms with high distressed risk have demonstrated the largest return reversals around earning announcement (Griffin and Lemmon, 2002). In this context, on the background of two financial crises, how do the inefficiencies in the equity markets caused by noise factor (Black, 1986) reconciles the behavioral of investors from risk based model? How does noise element contribute to this argument as the third factor? By incorporating investor sentiment of the stock market as a proxy for noise in behavioral finance, this research seeks to understand the impact of investor irrationality on the noise trader risk in time when fears are prevailing in the equity market.

While, on the one hand, numerous empirical evidences have shown that over the long run, the value stocks have consistently yielded a higher return than the growth stock, the question as to the resilience or loss resistance of either of these stocks classifications, especially during the period of a financial crisis, remains a less explored area in the academic discussion. In fact, the extent to which the investing horizon does play a role in predicting the returns of equity stocks serves as an interesting way of thinking when deciding on portfolio asset allocation. Moreover, the results may shed light on the optimal asset allocation for both static buy-and-hold and dynamic optimal rebalancing approaches.

Going further, preservation of investment capital in times of turbulence is a major concern for equity investors. World- renowned investment legend, Warrant E. Buffet, once said it succinctly:" Rule No. 1: Never lose money. Rule No. 2: Never forget rule No. 1 ". By understanding the underlying reasons through evidences from psychology – behavioral finance and risk model in this thesis, as well as the third factor - noise, the findings may potentially be a useful guide for investors to have a better chance to live thorough the next storm. Essentially, academic research in investment management philosophy is closely related to its practice.

1.2 Research problem, questions and objectives

Research problem

In the last three decades, numerous empirical studies on the developed and emerging markets have provided evidences that value-stock strategies outperformed growth-stock strategies in the long run (Fama and French, 1998,2012; Bauman et al, 2001). The superior return generated through the purchase of value stocks relative to growth stocks is known as the value premium. There are two competing schools of thoughts which offer theoretical explanations for the value premium phenomenon - risk based theories and behavior models.

However, the occurrence of the Global Financial Crisis and Eurozone Crisis has presented researchers with a new and alternative window to examine the value premium phenomenon. In light of the occurrence of the Global Finance Crisis, Krugman (2009) wrote that "the belief in efficient financial markets blinded many if not most economists to the emergence of the biggest financial bubble in history. And efficient-market theory also played a role in inflating that bubble in the first place." Furthermore, Malkiel (2011) also mentioned that "the crisis has also shaken the foundations of modern-day financial theory, which rested on the proposition that our financial markets were basically efficient ". As opposed to investing over the long run period which is more stable, the financial crises period is highly volatile. Against this background, the issue is whether the value premium phenomenon and the two competing explanations are still relevant and valid.

In response to this problem, this thesis proposes to study the performance of growth stock and value stocks in the Greater China stock markets during both the crises at overall firm, market capitalisation and market integration classifications. In this context, the thesis will examine the validity of the risk based model in explaining the value premium phenomenon during these two crises. The thesis will also construct noise-augment asset pricing models by reconciling volatility, as a proxy of the noise traders' risk in the financial market (DeLong, Shleifer, Summers, and Waldmann, 1990), with investor sentiments (Barberis, Shleifer and Vishny, 1998; Sheleifer, 2000; Baker and Wurgler, 2007) representing the behavior of investors.

The main contribution of the thesis is the construction of noise-augmented asset pricing models. These models are the extension of Fama & French Three Factor Model (1992,1993) and subsequent improved version of Five Factor Model (2015), by adding a behavourial factor - investor sentiment (INVSENT). To the author's knowledge, this is the one of the first attempts to quantitatively reconcile risk based theory and behavioral finance by developing parsimonious asset pricing models for explaining value premium phenomenon, especially in the context of financial crises.

Research question 1

Is there value premium in the Greater China stock markets during the Global Financial Crisis and Euro Zone Crisis?

Research objectives 1

- To assess the impact of Global Financial Crisis and Euro Zone Crisis on the performance of value stocks and growth stocks in the China, Hong Kong and Taiwan stock markets, taking into consideration overall firm and market capitalisation issues.
- To examine does the standard risk measures explain the risk and return relationship of these two stock selection strategies, at overall firm and market capitalisation levels, during the Global Financial Crisis and Euro Zone Crisis.

Research question 2

Do the risk factors explain value premium in the Greater China stock markets during two major financial crises?

Research objective 2

- To examine do and to what extent the risk measures of (i) Banko, Conover and Jensen Model (2006), (ii) Fama and French Three Factor Model (1992, 1993) and (iii) Fama and French Five Factor Model (2015) explain the value premium in the Greater China stock markets during the Global Financial Crisis and Euro Zone Crisis.

Research question 3

Do investor sentiment and risk measures explain value premium in the Greater China stock markets during two major financial crises?

Research objective 3

- To examine do and to what extent the investor sentiment measure and risk measures of (i) Fama and French Three Factor Model (1992, 1993) and (ii) Fama and French Five Factor Model (2015) explain the value premium in the Greater China stock markets during the Global Financial Crisis and Euro Zone Crisis.

1.3 Research Contributions

The main contribution of the thesis is the construction of noise-augmented asset pricing models. These models are the extension of Fama & French Three Factor Model (1992,1993) and subsequent improved version of Five Factor Model (2015), by adding a behavourial factor - investor sentiment (INVSENT). To the author's knowledge, this is one of the first attempts to quantitatively reconcile risk based theory and behavioral finance by developing parsimonious asset pricing models for explaining value premium phenomenon, especially in the context of financial crises. There are two schools of thought concerning the underlying explanations for the value premium phenomenon - risk based models and behavioral reasons. The rare occurrence of the Global Finance Crisis and Euro Zone Crisis have provided an appropriate and suitable context to reconcile volatility, as a proxy of the noise traders' risk in the financial market (De Long et al, 1990), with investor sentiments (Barberis et. al, 1998; Shleifer, 2000; Baker and Wurgler, 2007) representing the behavior of investors. Thus far, the Adaptive Market Hypothesis (Lo, 2004, 2005) is the first attempt towards reconciling the risk based theory and behavioral model as it is suggested that "these two perspectives are opposite side of the same coin" (Lo, 2004:15). With the extension of an existing theory, the noise-augmented asset pricing model is constructed by synthesizing disparate literatures from noise, investor sentiment and volatility. Therefore, this research is filling a knowledge gap and contributing distinctly to the development of knowledge.

Recent work on stock return predictability has suggested that predictability is mainly a short-horizon, instead of a long-horizon phenomenon (Ang and Bekaert, 2007). Moving along the same direction, the focus of the noise-augment capital asset pricing models is for the short and medium term in the volatile environment, whereas the conventional Three Factors model (Fama and French, 1992, 1993), Four Factors model (Carhart, 1997) and Five Factor Model (Fama and French, 2015) are being analysed in the stable environment over the long term horizon.

At the time of writing, a thorough study on the debate of value premium in the context of financial crises for the Greater China stock markets and its possible explanations, are missing in the financial economics literature. Given the occurrence of a financial crisis is a rare event, it is not surprising that, even though vast amounts of literature are in existence in the subject of value and growth investing, not much has been done to investigate the phenomenon of value premium in the short to medium term. Previous researchers were investigating the stock returns of the China and Hong Kong markets in the long run (Shum and Tang,2005; Wang and Di Iorio, 2007; Cakici et al, 2011). In essence, this thesis is filling an empirical gap in the financial economics literature than has not been undertaken before by pursuing the discovery of the performance of value stocks and growth stocks in a short to medium-term horizon during a high volatility period. The examination on the performance of the two stock selection strategies and the validity of the competing explanations represents an original contribution in terms of novelty of the understudied area or period in the literature.

Conventionally, majority of the studies are concentrated on the Western and developed markets. Griffin (2002) examines domestic, world and international versions of the Fama and French factor model for equity returns in a market integration context - Japanese, Canadian, U.K. and U.S. stock markets. With the thesis focusing its study on the market integration issue of the Greater China region stock markets – China, Hong Kong and Taiwan, this thesis also addresses the issue of an understudied geographic region.

1.4 Structure of the Thesis

The thesis develops through seven chapters. The first chapter outlines the general argument and motivation of the thesis. It then goes on to elaborate the research problem, questions and objectives. Thirdly, it proposes the contributions of the study to the field of Empirical Finance.

Chapter 2 identifies and explains the academic works on the asset pricing theory and empirical evidences. Secondly, it critically examines the relevant literatures on concept of value premium in the context of long term investment horizon and current understandings of possible explanations of value premium. The chapter continues to elaborate the concepts and relationships between noise, investor sentiment and volatility. Lastly, the empirical evidences, especially of the Greater China stock markets, are presented.

Chapter 3 sets out the theoretical framework of this thesis. The theoretical framework is built upon two important foundations – firstly, Thomas Kuhn's Theory of Scientific Revolutions (1996) and secondly, context as a vehicle for theory development (Johns, 2006)

Chapter 4 investigates the value premium in the Greater China stock markets during the Global Financial Crisis and Euro Zone Crisis. Section 2 outlines data selection and description of data. Section 3 describes the methodology. Section 4 provides the empirical results and analysis. The performance the growth stocks and value stocks together with the standard risk measures is presented. Section 5 discusses the empirical results and Section 6 contains the conclusions.

Chapter 5 studies the research question of do the risk factors explain value premium in the Greater China stock markets during two major financial crises? The research considers three models from the risk based theory under the value premium literature – Banko, Conover and Jensen (2006), Fama and French Three Factor Model (1992, 1993) and Fama and French Five Factor Model (2015). Section 2 outlines data selection and description of data. Section 3 describes the methodology and its justification. Section 4 provides the empirical results and analysis. Section 5 discusses the empirical results and Section 6 contains the conclusions.

Chapter 6 presents noise-augmented asset pricing models by examining evidence from the Greater China stock markets during two major financial crises. Section 2 describes and discusses the measure of noise – investor sentiment (INVSENT). Section 3 outlines data selection and description of data. Section 4 describes the methodology and its justification. Section 5 provides the empirical results and analysis. Section 6 discusses the empirical results and Section 7 contains the conclusions.

Chapter 7 The concluding chapter reexamines the three main research questions and argument of the thesis. The chapter explains how the argument has been developed throughout the thesis. It includes an analysis of the development of the theoretical framework as set out in Chapter 3 and how the theoretical framework has been supported by empirical evidence. The conclusions then move on to outline the limitations of this study and directions for future research. Lastly, it discusses the potential practical implications of the study.

CHAPTER 2: LITERATURE REVIEW

"The stock market is filled with individuals who know the price of everything, but the value of nothing."

Phillip Fisher

The study of investment is one of the three main areas of finance, apart from corporate finance and financial markets and institutions. Investment examines the determinants of portfolio allocation decisions of investors, individual and institutional, as well as the implications for the pricing of financial instruments such as equity stocks, bonds, and derivative securities. In this section, the survey of literature of financial theory and empirical evidences relating to equity investment is provided. As the amount of related literature is considerable, with different emphases, therefore, the survey is divided into the following areas: (1) Asset pricing – theory and empirical (2) Value premium – competing explanations (3) Noise, volatility and investor sentiment (4) Further empirical evidences

2.1 Asset Pricing - Theory and Empirical

The study of asset pricing, with the testing of well-established or new theories using financial data, is important to the development of empirical finance. Since the publication of *Common Stocks as Long Term Investment* (Smith, 1928), an important milestone was established where equity is accepted and classified as an asset class of investment. It was evidently demonstrated in this work on the superiority of equity, to bonds and other asset classes, as long term investment. Prior to that, equity was viewed as speculations.

A clear distinction between investment and speculation was made in the seminal *work Security Analysis* (Graham and Dodd, 1934), where "an investment operation is one which, upon thorough analysis, promises safety of principal and a satisfactory return. Operations not meeting these requirements are speculative."

2.1.1 Sources of Returns Predictability – CAPM, APT and the Cross-Section of Expected Returns

The random walk theory suggests the unpredictability in the stock price movement. The emergence of the '*common stock theory of investment*' (Bosland, 1937) signified a major shift from the random walk theory. The work of Lo and MacKinlay (1999) has made the proposition for the rejection of random walk model. The argument was built on the evidences from the weekly stock market return of an empirical work using 1,216 weekly observations from 1962 to 1985 in a simple volatility-based specification test. With this development, the research to investigate the sources of predictability of equity returns, have attracted considerable attentions in the empirical literature of financial economics (Ferson and Hayvey, 1991; Haugen and Baker 1996).

The birth of the asset pricing theory, following the development of Capital Asset Pricing Model (Sharpe,1964; Litner, 1965 and Black, 1972) has brought a new dimension in the relationship between average return and risk of financial assets and impacted the field of finance. In this context, Fama and MacBeth (1973) also found that beta of the stocks has a roughly linear relationship with average returns. Higher beta stocks have higher average returns than lower beta stocks. On the other hand, Ross (1976) proposed an alternative theory that can potentially overcome the weaknesses of the CAPM - the Arbitrage Pricing Theory (APT). It is argued that the expected return of an equity stock can be modeled as a linear function of various macro-economic factors. The APT is based on the law of one price and does not make any assumptions about the investor's preferences.

However, subsequent empirical research (Banz, 1981; Basu 1983; Rosenberg, Reid and Lanstein, 1985; Fama and French, 1992; Carhart, 1997) have shown that in addition to the beta of the model, other variables, such as size, various price ratios and momentum explains the average returns as well. The studies on the cross section of equity stock returns have now become an important theme. The examinations of equity returns are carried out on various financial variables and models, such as volatility (French, Schwert and Stambaugh, 1987), dividend yield (Fama and French,1988), three factors model (Fama and French, 1992, 1993), four factor model (Carhart, 1997), five factor model (Fama and French, 2015), firm's characteristics (Davis, Fama and French, 2000), emerging markets (Claessens, Dasgupta and Glen, 1998) and the more recent of investor sentiment (Baker and Wurgler ,2006).

In order to determine which factors drive global stock returns, Hou, Karolyi and Khol (2011) have comprehensively examine monthly returns of 26,000 individual stocks from 49 countries over the 1981 to 2003 period. It was found that the momentum and cash flow/price factor-mimicking portfolios, together with a global market risk factor, capture substantial common variation in global stock returns. In addition, the three factors explain the average returns for country and industry portfolios, and a wide variety of single- and double-sorted characteristics-based portfolios.

Against this background, Karolyi (2016) when assessing and reflecting on the research in the cross-section of expected returns has raised some critical questions in the future research direction. Among others are – "to what extent are our inferences about certain anomalous patterns in the cross-section of expected returns related to biases and inefficiencies in our testing procedures are all factor discoveries equally important?, do some proposed factors subsume the explanatory power of others? Is the after-trading-cost performance of some anomalies more resilient than that of others?"

2.2 Value Premium and the Competing Explanations

In assessing the performance of equities through empirical studies, the classification into value stocks and growth stocks are made. Growth stock (Reiley and Brown, 2006 : 1137) is defined as "the one that generate a higher rate of return than other stocks in the market with similar risk characteristics", whereas value stock is "the one that appear to be undervalued for reasons beside earning growth potential" (Reiley and Brown, 2006 : 1145)

In the last three decades, numerous empirical studies on the developed and emerging markets have provided evidences that value-stock strategies outperformed growth-stock strategies in the long run (Fama and French, 1998,2012, 2015; Bauman et al, 2001). The superior return generated through the purchase of value stocks relative to growth stocks is known as the value premium.

Earlier studies focus on a one-dimensional value description, such as the price-to-earnings (P/E) ratio (Basu, 1977) and the book-to-market (B/M) ratio (Rosenberg et al, 1985). These works were subsequently followed by the research on a multi-dimensional description of value. For instance, value and growth strategies were classified on sales, B/M ratio and P/E ratio respectively (Basu, 1983; Fama and French, 1998) as well as on B/M ratio, cash-to-price (C/P) ratio, E/P ratio and growth of sales (G/S) as measures of value (Lakonishok et al., 1994).

While the earlier research was concentrated on the U.S. market, an investigation to study the relationship between stock returns and variables in the Japanese stocks market was made (Lakonishok et al, 1991), representing the first few empirical studies outside the U.S. market. This study had considered four main variables – size, B/M ratio, E/P ratio and C/P ratio. It was concluded in this research, with sample period from 1971 to 1988, there is a significant relationship between the average return and four variables in the Japanese stock market, in particular B/M ratio and C/P ratio. In this paper, the authors offered no explanation on the findings observed.

Furthermore, value premium was observed on the average return in the twelve of the thirteen major markets, in a study of international stock markets behavior for period 1975 through 1995 (Fama and French, 1998). Four valuation ratios – B/M ratio, E/P ratio, C/P ratio and dividends-to-price (D/P) ratio were considered. The study, however, concluded that the international Capital Asset Pricing Model (CAPM) did not provide sufficient evidence to support the notion of risk factor as an explanation for value premium.

Similar findings where value stocks generally outperformed growth stocks in international markets were also discovered in other studies (Bauman, Conover and Miller, 1998, 2001). In additions, the authors have found a strong firm size effect where value stocks generated a higher return than the growth stocks in all firm capitalization, except the smallest. Firm size effect was revealed in other works as well (Banz, 1981; Reinganum,1981) that the returns in the stocks of small U.S. companies have surpassed those of large companies. These findings on firm size effect were initially considered by the academician as stock market anomalies.

The earlier works on value premium were only confined to study of value effects at the over firm and market capitalisation classifications (Fama & French, 1992, 1993). However, Banko, Conover and Jensen (2006) have advanced the study to industry level. In their research, the study on the value effects at the industry-level was conducted to examine the relationship between stock returns and book-to-market-equity in 21 industries of the U.S. economy.

With the international capital market becoming even more efficient and integrated, the question on the contemporariness of the three factors model was posed. Griffin (2002) examines whether country – specific or global version of the model better explain time-series variation in the international stock returns. By decomposing the world factors into domestics and foreign components and using monthly data from 1981 to 1995 of the U.S. , Canada, the United Kingdom and Japan, it was revealed that domestic versions, rather than the world factors, of the three factor model are more useful in explaining time series variation of stock returns.

The phenomenon that the value stocks earned higher expected returns than growth stocks in the long run has attracted much academic debates, especially on the underlying theoretical reasoning. In the following section, the thesis reviews some of the important works on the two competing explanations -the risk based theory and behavioral model.

2.2.1 Risk Based Theory

One of the best known studies on the asset pricing model for the cross-section properties of stock returns is Fama and French's Three Factor Model (1992, 1993). In this model, it is argued that the sources of predictability of expected stock returns are the excess market return, a size factor (SMB) and a book-to-market equity factor (HML).

The book-to-market equity factor (HML) appears to be inconsistent to the Capital Asset Pricing Model (CAPM) and Arbitrage Pricing Theory (APT). Going further, it was proposed that the Three Factor Model has provided a multifactor explanation for the stock market anomalies (Fama and French, 1996).

Nevertheless, it was also argued that Fama–French model cannot explain many cross-sectional patterns. On the one hand, the pattern includes the positive relations of average returns with short-term prior returns and earnings surprises. On the other hand, the examples are the negative relations of average returns with financial distress, net stock issues, and asset growth. To address the weaknesses, a new three-factor model from q-theory which consisting of the market factor, a low-minus high investment factor, and a high-minus-low ROA factor was proposed(Chen and Zhang , 2010).

In addition, Carhart (1997) has subsequently developed a four factor model in order to perfect Fama and French's work by incorporating an additional factor – momentum. However, the four factor model was subsequently criticised, as it was found that the model fails to absorb all the momentum in the U.S. average stock returns (Avramov and Chordia, 2006).

Further study by Fama and French (2008) has revealed that the anomalous returns associated with net stock issues, accruals, and momentum are pervasive and shown up in all size groups in cross section regressions. The asset growth and profitability anomalies are less robust. In another separate study by Fama and French (2012) involving four regions (North America, Europe, Japan, and Asia Pacific), it was found that there are value premiums in average stock returns and with the exception of Japan, market capitalisation size effect. In the testing of whether empirical asset pricing models capture the value and momentum patterns in international average returns and whether asset pricing seems to be integrated across the four regions, it was found that integrated pricing across regions does not get strong support

In an empirical research carried out on Pacific Rim market, it was found that value stocks are riskier due to the characteristics associated to the firm, such as firms under distress, high financial leverages and face substantial uncertainty in future earnings. The authors argue that these risk characteristics are as powerful as book-to-market in explaining cross-sectional differences in return in Pacific markets (Chen and Zhang,1998).

In 2015, Fama and French have proposed a five factor asset pricing model by adding two new factors – profitability factor (RMW) and investment factor (CMA). Fama and French

(2015) argue that “a five-factor model directed at capturing the size, value, profitability, and investment patterns in average stock returns perform better than the three-factor model of Fama and French”. In a separate but related paper, Fama and French (2016) further reveal that positive exposures to returns that behave like those of the stocks of profitable firms (RMW) that invest conservatively (CMA) explains the high average returns associated with low market β, share repurchases, and low stock return volatility. On the other hand, relatively unprofitable firms (RMW) that invest aggressively (CMA) help capture the low average stock returns associated with high β, large share issues, and highly volatile returns.

As mentioned in the earlier section, Banco et al. (2006) study the relationship between the value effect and industry affiliation. The risk measures adopted in this research are BE/ME (book-to-market ratio), industry BE /ME (industry book-to-market ratio), ME (market capitalilsation) and beta. The contribution of this piece of work is that firm-level book-to-market effect is more prominent that the industry-level book-to-market effect. Furthermore, it was demonstrated that value effect is observed with strongest in value industries and weakest in growth industry.

On the question of whether risk based model can explain value premium phenomenon Phalippou (2006) has found that “some of the most prominent risk-based theories offered as explanation for the value premium are at odds with data”. The main finding is that risk based models, such as Fama and French (1993), Lettau and Ludvingson (2001) as well Campbell and Vuolteenaho (2004), and Yogo (2005) are able to explain the cross section of returns of portfolios sorted on book-to-market ratio and size. However, these models are unable to capture the cross section of returns of portfolios sorted on book-to-market ratio and institutional ownership. In addition, Barbers, Huang and Odean (2016) studied which factors investors attend to by analysing mutual fund flows. In their research, four competing models of risks are considered: market-adjusted returns, the Capital Asset Pricing Model (CAPM), the Fama-French three-factor model and the Carhart four-factor model. The main finding shows that investors attend most to beta or market risk when evaluating funds. Furthermore, most investors do not treat other factor returns as compensation for risk when evaluating the performance of actively managed mutual funds.

2.2.2 Behavioral Finance and Models

On another development, one of the important icons of the modern financial economics - the efficient markets hypothesis (Fama, 1970) has also subjected to much criticism in recent years. The efficient markets hypothesis argues that the financial markets are informationally efficient, For instance, Haugen and Baker (1996:401) have made opposing view and argue on the “revelation of a major failure in the Efficient Market Hypothesis”.

In response, Fama (1998: 283) countered argue that “market efficiency survives the challenges from the literature on long-term return anomalies”. He further elaborated that “the anomalies are chance results, apparent overreaction to information is about as common as underreaction …….Most important, consistent with the market efficiency prediction that apparent anomalies can be due to methodology ………..”.

The works of Shiller (1981a,1990) on excess and market volatility contributed significantly to the breakthrough of behavioural finance. Following from that, Shiller further advocated for behaviour finance. He mentioned (2003:83) that “-that is, finance from a broader social science perspective including psychology and sociology- is now one of the most vital research programme, and it stands in sharp contradiction to much of efficiency markets theory”. The emergence of behavioral finance in the recent years, as an alternative to the traditional finance, poses a serious challenge to the validity of efficient market hypothesis.

Behavioral finance is defined by Shefrin (2002:3) as “the application of psychology to financial behavior – the behavior of practitioners”. In Ritter (2003:429), it is proposed that the two main building blocks of behavioral finance are cognitive psychology (how people think) and the limits to arbitrage (when market will be inefficient). Whereas, Shefrin (2002:4-5) has suggested three main themes – heuristics-driven bias, frame dependence and inefficient markets. The psychological biases which are well documented in the literature are overconfidence bias, representativeness bias, self-attribution bias, mental accounting bias, conservatism bias, loss aversion bias and framing bias (Pompian, 2006:51,62,104,171,187,208,237).

In addition, Olsen (1998) outlined the emergence of behavioral finance and its implication for stock price volatility. Along the same line, Hirshleifer (2001) argued that new prospects are open when the relationship between investor psychology and asset pricing were expounded. In this piece of work, a framework for understanding decision biases was drawn.

It is viewed that the term ‘animal spirits’ – the emotion or affect which influence human behavior, as coined by Keynes in 1936 classic *The General Theory of Employment, Interest and Money* and propagated by Akerlof and Shiller (2009) following the Global Financial Crisis, are responsible for the market inefficiency. The mispricing resulting from the inefficient market - that is the deviation of the market price from the fundamental value of equity stocks, creates arbitrage opportunities for abnormal profit (Shiller, 2005).

In order to test market efficiency of the value premium phenomenon, La Porta, Lakonishok Shleifer and Vishny (1997) examined whether investors make systematic errors in pricing. The evidence obtained from examining the market's reaction on earning announcements has showed inconsistency with the risk based explanation.

Furthermore, it was thought that the contrarian nature of the value stocks strategies, may have given rise to the superior performance of these investing strategies (Dreman, 1998). For instance, the empirical work on the contrarian model developed based on the data in the U.S. market, argued that the higher return of value strategies could be attributable to the fact that they are contrarian to “naïve” strategies followed by other investors (Lakonishok, Shleifer and Vishney,1994). With this, it is implied that the over-extrapolation of the past performance by the investors, leaving those stocks that have had poor past performance underpriced and those that have had good past performance overpriced, resulting in higher profitability of value investing strategies. By classifying stocks into value stocks and glamour stocks using four measures - B/M, C/P, E/P and G/S, it was demonstrated that out of favour value stocks have outperformed glamour stocks for period 1968 to 1990. Gregory, Harris and Michou (2001) have found similar empirical evidence on the analysis of contrarian investment strategies in the U.K. for period 1975 to 1998. These empirical evidences revealed that the value premium is the result of behaviour of investors, instead of risk factors.

The earlier influential works of DeBondt & Thaler (1985, 1987), by applying the models developed by Tversky & Kahneman (1973, 1979) in the new field of behavioural finance to market pricing has actually laid the foundation to this debate. They argued, the irrational behaviour of investors to news, both good and bad, has resulted to which they called ‘overreaction’. The stocks that have shown poor performance over the past three-to-five years (losers) tend to yield better returns than the prior period winners during the subsequent three-to-five years period. In this context, a theory of securities market underreaction and overreactions has been proposed based on two well-known psychological biases – investor overconfidence and self-attribution (Daniel, Hirshleifer and Subrahmanyam,1998). Overconfidence bias is defined as “unwarranted faith in one’s intuitive reasoning, judgments and cognitive abilities”(Pompian, 2006:51) whereas self-attribution bias is “the tendency of individuals to ascribe their successes to innate aspects, such as talents or foresight, while more often blaming failures on outside influences, such as bad luck” (Pompian, 2006:105).

In the study of market inefficiencies which are non-repeating and long term in nature, where ascertainment of peaks and troughs are difficult or almost impossible, the theory of limits of arbitrate was developed (Shleifer and Vishney, 1997). The attractiveness of such opportunities is offset by the high volatility and therefore, risk of losses. In the event of losing streak, the withdrawals of investment fund by investors following the selling or buying pressure may actual worsen the situation and exacerbates the inefficiency.

Notwithstanding the advances in the behavioural finance, its development has been criticised of its lack of empirical works, where potentially boundless set of psychological biases underlying the behavioral explanation for security prices can lead to overfitting of theories to data. One of the major studies attempted to refute such a claim is an investigation to assess the predictive ability of behavioral finance theories using out of sample data (Chan, Frankel and Kothari, 2004). In this research, the pricing effects of two psychological biases – representativeness and conservatism were tested, by operationalising them in using trends and consistency in financial performance – sales, operating income and net income. The results of this research revealed that some pricing implications of conservatism, but not representativeness, were found in the evidences. In this instance, the representativeness bias could be defined as the "tendency of individuals to classify things into discrete groups or categories based on similar characteristics" (Pompian, 2006:62), whereas conservatism bias is" a mental process in which people cling to their prior views or forecast at the expense of acknowledging new information.(Pompian, 2006:119).

Based on the findings of Chan et al. (2004) on the testing of behavioral finance using trends and sequences in financial performance contrast, Daniel (2004) made contrasting argument that the evidences is for the long-horizon return predictability, consistent with the theory of securities market under-and over-reaction.

The debate on the explanatory power of risk based theory and behavioral model on the profitability of various stock selection strategies – value, momentum and earning revision, was further investigated in the context of emerging markets (van der Hart, de Zwart and van Dijk, 2005). By examining the four factor model, the authors concluded that the empirical evidence has shown that both the emerging market risk and global risk factor do not support the risk-based explanation, although the results do not prove that the risk based explanation is incorrect either. On the other hand, the author argued that the findings of this research are consistent with the evidence from the developed market in supporting behavioural explanation, with underreaction and overreaction effects.

Petkova and Zhang (2005) examined the important question of whether value is riskier than growth. In the quest of validating the common perception in behavioral finance that value cannot be riskier than growth, beta is sorted on the expected market risk premium, instead of on the realized market excess return. The finding, however, is inconsistent with the argument that value cannot be riskier than growth. Empirical results show that there is a positive covariance of value betas and a negative covariance of growth betas with the expected market premium. Despite this evidence, the authors have concluded that the beta premium covariance is insignificant in explain the size of the value premium, within the framework of conditional capital asset pricing model.

2.2.3 Recent developments

The phenomenon that the value stocks earned higher expected returns than growth stocks in the long run has attracted much academic debates. While the risk based theory and behavioural models are engaged in the argument of value premium for a reasonable time period, the other explanations also emerged. One of the more notable works is the theoretical model which built on the economic determinants of the firm (Zhang, 2005). It is argued that the model which links asset prices to real economy may be the possible explanation for value premium. In this paper, the higher distressed risk of value firms is demonstrated to be resulted from two salient features of model. Firstly, cost reversibility - the higher costs in cutting than expanding capital and secondly, the discount rate which are higher in bad times with the counter cyclical price of risk. By so doing, the author is convinced that irrational overreaction explanation on value premium is in principle consistent with risk based theory.

A recent study has provided a comprehensive evidence on the risk premium to value and momentum strategies globally across asset classes, and uncover strong common factor structure among their returns (Asness, Moskowitz and Pedersen,2013). The results indicated the presence of common global risks that the authors characterized with a three-factor model. The simple three factor model consists of a global market index, a zero-cost value strategy applied across all asset classes, and a zero-cost momentum strategy across all assets. The authors argue that the strong correlation structure among value and momentum strategies across such diverse asset classes is difficult to be explained by the existing behavioral theories. In addition, the high return premium and Sharpe ratio of a global across-asset-class diversified value and momentum portfolio is even more challenging for rational risk-based models to accommodate, than the more traditional approach of considering value or momentum separately in a single asset market.

2.3 Noise, Investor Sentiment and Volatility

2.3.1 Noise

The concept of noise when trading and investing in the financial markets was introduced in a seminal work (Black, 1986). Noise is viewed as one of the factors which make the market to be somewhat inefficient. Model in the context of three different fields were proposed – finance, econometrics and macroeconomics. The author first explained noise trading in the financial markets as if it were information. Then, the effect of noise in econometrics was considered and thirdly, the notion of uncertainty noise was introduced when the business cycles are caused by unanticipated shifts in the entire patterns of tastes and technologies across section.

Following from this, numerous theoretical works flourished in this area. The works, however, limited mostly on trading in the financial markets, leaving the econometrics and macroeconomics somewhat unexplored. In an attempt to fill the knowledge gap left by Black on the reason why any rational person would want to trade on noise, a theory of noise trading in the securities was developed (Trueman,1988). In this model, it was argued that manager of an investment fund is motivated for such trading, where it is more commonly observed in riskier assets.

The concept of noise was brought a step further when it is viewed as a source of risk when trading in financial markets. The model contains noise traders and sophisticated investors (De Long et al, 1990). Secondly, the authors argued that it is, therefore, possible for the noise traders to earn a higher average rate of returns, if the portfolios are concentrated in assets subject to noise trader risks. In this context, the relationship between noise trading and asset market behaviour was explored. The authors argued that it is possible for contrarian investment strategies to work in the long time horizon. The investors capitalise on the mean reversion of asset prices when in time of volatility, the asset prices respond to noise and if the errors of noise traders are temporary.

In another paper, De Long et al. (1991) argued that the noise traders as a group, can earn a higher return than rational investors, as well as survive in the long run. The work is based on a separate model of portfolio allocation by noise traders with incorrect expectations about return variances.

In an investigation to question the predictability and volatility of stock return, Campbell and Kyle (1993) conducted an empirical research on the U.S. stock returns in the period 1871 – 1986. It is revealed that it implied the asset prices respond not only to news, but also to noise trading or irrational demand. Though the noise depends sensitively to the interest rate, the empirical evidence also revealed that a particular type of noise appeared to be highly correlated with fundamental value. The authors termed this phenomenon as overreaction, as the response of stock prices to news about fundamental is more than it otherwise would be.

Against the background of standard finance model with unemotional investors, these developments have prompted an alternative proposal - the noise approach to finance (Shleifer and Summers, 1990), to the efficient market hypothesis. These authors proposal is built on two assumptions. Firstly, the limit to arbitrage (Shleifer and Vishney, 1997) and secondly, the irrationality of some investors as well as their beliefs or sentiments which affect their demand for risk assets.

Arnott, Hsu, Liu and Markowitz (2014) examined the relationship of noise with size and value effects, with the construction of a parsimonious model. The assumption on the value process is to be a random walk and the noise is a mean-reverting process. Based on the argument that noise is a temporary deviation of stock prices from their fundamental, the authors have suggested that the growth-value cycle is essentially the result of the noise variance on its expansion and contraction. Hence, size and value effects are manifested.

In their model, Mendel & Shleifer (2012) have illustrated that rational but uninformed traders occasionally chase noise as if it were information. As a result, the sentiments shocked are amplified and prices are moved away from the fundamental values. It is argued that noise traders can have an effect on the market equilibrium disproportionately, relative to their size in the market.

Stambaugh (2014) observed the investment trend in the past few decades saw the rise of indexing and the shifts made by active managers toward lower fees and more index-like investing. On the other hand, the fraction of the equity market owned directly by individual reduced significantly. On the background of this investment trend, an equilibrium model linking these investment trends to the decline in individual ownership is developed. It is argued that active management corrects most noise-trader induced mispricing. In addition, fraction left uncorrected shrinks as noise traders' stake in the market declines. On the issue of investment trend, Stein (2009) also posed a similar question that will the trend of stock market trading that is increasingly dominated by sophisticated professionals, as opposed to individual investors lead to greater market efficiency?

On the relationship of R-squared, noise and stock returns, Chang and Luo (2010) found that stocks with lower R-squared are more difficult to value. These stocks tend to be affected by investor sentiment, attract retail investors, and are avoided by institutional investors. In examining the relation between R-squared and expected stock returns, it is revealed that these results are consistent with the conjecture that stocks with lower R2 have poor information quality and are more likely to be subject to noise trading. Based on the results, it is also suggested that the trading activities of noise traders are correlated and affect stock returns in a systematic way.

2.3.2 Investor Sentiment

Barberis, Shleifer and Vishny (1998) presented a model of investor sentiment based on and motivated by a variety of psychological evidence. It is argued that people are paying too much attention to the strength of the evidence they are presented with and too little attention to its statistical weight. This assumption has resulted in the prediction that stock prices underreact to earnings announcements and similar events. According to the authors, they have further assumed that consistent patterns of news, such as series of good earnings announcements, represent information that is of high strength and low weight. This assumption has yielded a prediction that stock prices overreact to consistent patterns of good or bad news.

Baker and Wurgler (2007: 129) defined the investor sentiment found in as “a belief about future cash flows and investment risk that is not justified by the facts at hand” , whereas Sheleifer, 2000, p12 described it as “…..reflects the common judgment errors made by a substantial number of investors, rather than uncorrelated random mistakes.”

The question as to whether and what measures of investor sentiment are to be used is essential in the study of stock return prediction, as evidenced in the empirical works.In an investigation on data of closed-end funds from 1933 to 1993, mixed results were discovered on the predictability of the sentiment measures on size premium - the difference between small and large firm return (Neal and Wheatley, 1998).The three measures of investor sentiments are the level of discounts in closed-end funds, the ratio of odd-lot sales to purchase and net mutual fund redemption. However, the discounts in closed-end fund and net mutual fund redemption were found to be significant.

In contrast, Baker and Stein (2004) have considered some other indicators, such as bid-ask spreads, price impact of trade and turnover, as the proxies of market liquidity (investor sentiment) in a study on the connection between market liquidity and expected returns. In the model which featured irrational investors who underreact to information contained in the equity issues, the authors argued that in a market with high degree of liquidity is a sign that these investors have positive sentiment. Hence, the expected returns are abnormally low.

With this development, the argument for the construction of a sentiment index that could explain which types of stocks that are likely to be most affected by sentiment has surfaced (Baker and Wurgler, 2007). It is viewed that this paradigm is more important in the future research direction, instead of the broad classifications of investor sentiment into bottom up approach by using psychological biases and top town approach with focus on macroeconomic. The authors further argued that the level of stock prices in the aggregate depends on sentiments. Based on the argument, the authors investigated this problem by constructing a sentiment index to predict stock returns, both on the cross-sectional dimension and at the aggregate level. The construction of sentiment index is based on six sentiment proxies - closed-end fund discount, detrended log turnover, numbers of initial public offerings (IPOs), first-day return on IPOs , dividend premium and equity shares in new issues. This research has found that on the cross-sectional predictability, the average future returns of speculative stocks are on average lower (higher) than the returns of bond-like stocks when the sentiment is high (low). This finding is inconsistent with the capital asset pricing model which states risks and returns are positively correlated. For aggregate predictability, it was revealed that when the sentiment is high, subsequent market returns are low, consistent with the empirical findings of Baker & Stein (2004).

On the other hand, Brown and Cliff (2004) conducted a study on the effect of investor sentiment on investment time horizon and near-term stock market, from a VAR model. It is found that the sentiment is a source with low predictability power for near-term stock returns, even though there are strong correlation between sentiment level and changes with existing equity returns. Secondly, the evidence of the study also showed that the sentiment lacks the power to affect individual investors and small stocks, as it was believed in the conventional thinking.

However, the examination of the relationship between cross section of equity returns and investor sentiment in the long term, based on data from 1961 through the Internet bubble in 2001, has posed another challenge to the classical finance theory (Baker and Wurgler, 2006). An important finding is that the test based on the classical finance explanation, which reflects a complex compensation for systematic risk, found no linkage between the patterns in predictability of investor sentiment and patterns in betas with market returns. In their work, both the theoretical prediction as well as empirical evidences revealed that the cross-section of future returns is conditional on beginning-of-period proxies for sentiment, where the younger stocks, small stocks, unprofitable stocks, non-dividend-paying stocks, high volatility stocks, extreme growth stocks and distressed stocks tends to earn higher (lower) subsequent returns when the sentiment is estimated to be low (high).

In testing whether investor sentiment affects the time series of international market level returns as well as time-series of the cross-section of international returns, Baker, Wurgler and Yuan (2014) discovered that both global and local sentiment are statistically and economically significant contrarian predictor of market returns as well as the relative returns on high sentiment-beta stocks. Sentiment appears to be contagious across market based on tests involving capital flows.

The extent to which the investor sentiments plays an important role in the creation of noise in the financial market as well as how does it affect the asset pricings were investigated empirically in another research (Barbers, Odean and Zhu,2009). In this study, the focus is on the behaviour of individual investors as the noise traders, as opposed to the institutional investors with herding behaviour. In the analysis of the trading records for over 60,000 households at a large discount broker and over 600,000 investors at a large retail broker, the evidences have shown that there is a high degree of correlation among the trading of individuals. Hence, the noise in the trading is systematic. The authors further argued that the determinants of correlated trading by the individuals are likely to be psychological biases, instead of changing in risk aversion and herding behavior.

Similarly, the study on the relationship of volatility, sentiment and noise traders in the closed-end investment funds of U.S market has demonstrated strong evidence of relationship is observed between individual sentiments and increased volatility (Brown, 1999). It is argued from this research that volatility, a representation of systematic risk and caused by the irrational investors in the noise trading, can affect asset prices and generate additional volatility.

Zouaoui, Nouyrigat and Beer (2011) tested the impact of investor sentiment on a panel of international stock markets in relation to stock crises. In examining the influence of investor sentiment on the probability of stock market crises, they found that investor sentiment increases the probability of occurrence of stock market crises within a one-year horizon. It is argued that the impact of investor sentiment on stock markets is more noticeable in countries that are culturally more prone to herd-like behaviour, overreaction and low institutional involvement.

2.4 Further Evidences

2.4.1. Fama and French Five Factor Model

Chiah, Chai and Zhong (2015) conducted an empirical investigation of the Fama and French five-factor model in Australia, by using extensive sample over 1982 to 2013 period. The evidence shows that the five-factor model outperforms Fama and French three factor model. In addition, in the context of Australia it is argued that the book-to-market factors its explanatory power, even with the addition of two new factors – profitability and investment factors. In the case of profitability and investment factors for the UK asset pricing models, Nichol and Dowling (2014) argued that the profitability factor of the Fama and French Five Factor Model has the most potential.

2.4.2. Investment Horizon

With the growing body of empirical evidences that returns on equity assets are predictable, the next question which concerns both the researches and practitioners alike is the investor's horizon. The notable works in this area have considered, among others, the explanation on the short-term pursuit of capital gains and the selection by firms of short-term investment projects (Shleifer and Vishny, 1990); the examination of book-to-market ratio across the calendar seasonality effect along two other dimensions – firm size and exchange listing (Loughran ,1997).

In studying the effects of Asian Crisis on global equity markets, Tuluca and Zwick (2001) discovered that for the market as a group, a reduction in the number of common factors that generate returns was observed. After the Asian crisis began in July 1997, the volatility and comovement of returns among global markets increased.

With the outbreak of the Global Financial Crisis 2007 and Eurozone Crisis, the study on the stock returns and volatility during these episodes has also attracted the interests of researchers. In an empirical study on the stock returns behaviour during financial crises of Jordan Stock Exhange from 1992 to 2009, it was identified episodes of significant price declines "crashes" (Al-Rjoub and Azzam, 2011). On the other hand, Karanasos, Paraskevopoulos, Ali, Karoglou and Yfanti (2014) introduced a platform to examine empirically the link between financial crises and the principal time series properties of the underlying series.

2.4.3. Empirical evidences – Asia and Great China region

Shum and Tang (2005) examined the relevance and application of the Fama and French three factor model in three Asian emerging markets – Hong Kong, Taiwan and Singapore. It was found that the model can explain most of the variations in average returns, consistent with the U.S. findings. While the main contributing factor is the contemporaneous market excess returns, the impact of the size effect and book-to-market factor is limited and in some cases insignificant.

On the issue of dynamic linkage between the Greater China region stock markets – Mainland China, Hong Kong and Taiwan, the empirical evidences showed there exist weak nonlinear relationships between these markets (Cheng and Glascock, 2005).

In an empirical investigation to study the effects of the 1997 financial crisis on the efficiency of eight Asian stock markets, the results demonstrated that the crisis adversely affected the efficiency of most Asian stock markets. It is revealed that Hong Kong being the hardest hit, followed by the Philippines, Malaysia, Singapore, Thailand and Korea. However, improved market efficiency was observed in most of these markets, with recovery in the post-crisis period. The findings of higher inefficiency during the crisis are not a surprise phenomenon as in the chaotic financial environment at that time. At that time, investors would overreact not only to local news, but also to news originating in the other markets, especially when the news events were adverse (Lim, Brooks and Kim, 2008).

In another study to determine Chinese stock returns, it has shown that size, instead of book-to-market, helps to explain cross-sectional differences in Chinese stock returns from 1996-2002 (Wang and Xu ,2009). In addition, beta does not account for return differences among individual stocks, similar to the U.S. experience. Based on the findings, the authors argued that the book-to market variable may have reflected fundamentals in the U.S. markets. However, the research did not capture book-to-market due to the speculative nature of the Chinese capital markets and low quality in the accounting information.

In a similar research to explore the cross-sectional relationship between stock returns and some firm-specific characteristics in the Chinese A-share market for the period 1994 to 2002, Wang and Di Iorio (2007) revealed that beta lacks explanatory power and size has the most significant effect in capturing variations in stock returns.

The examination of the profitability of intermediate- and long-horizon relative strength strategies (buying past winners and selling past losers) over the July 1994–December 2000 interval in China's stock market also shows that firm size, book-to-market, and beta effects are qualitatively similar to those in the US and other markets. Small stocks outperform large stocks, value stocks outperform growth stocks, and betas do not appear to be associated with average stock returns. The stock return behavior in China is not inconsistent with the rational risk-based pricing model (Wang,2004).

In a recent study conducted to provide a comprehensive analysis on the stock return predictability in China from January 1994 to March 2011 (Cakici et al, 2011), the strong predictive power of size, price, B/M ratio, C/P ratio and E/P ratio was found. In a similar development, investigation on the Fama-French three factors in Chinese stock market has shown that the three-factor model can explain more than 93% of the variation in the portfolio returns on Chinese A-shares (Xu and Zhang, 2014)

Kang, Liu and Ni (2002) conducted a research to test if short-horizon contrarian and intermediate-horizon investment strategies generate abnormal profits. The result shows that

(i) excessive overreaction to firm-specific information, due to an absolute dominance of non-institutional investors in an environment of excessive speculation;
(ii) the overreaction to firm-specific information is the single most important source of the short term contrarian profit;
(iii) the stock returns in the intermediate horizon exhibit lagged overreaction to common factors; and
(iv) the lead-lag overreaction to common factor is the major reason behind the intermediate-term momentum profit.

Similar to previous studies in the US stock markets, Lam (2002) found that beta is unable to explain the average monthly returns on stocks continuously listed in Hong Kong Stock Exchange for the period July 1984–June 1997 by using the Fama and French model. However, three of the variables, size, book-to-market equity, and E/P ratios, seem able to capture the cross-sectional variation in average monthly returns over the period. In addition, the other two variables, book leverage and market, are also able to capture the cross-sectional variation in average monthly returns

CHAPTER 3 – THEORETICAL FRAMEWORK

"A new type of thinking is essential if mankind is to survive and move to higher levels"

Albert Einstien

3.1 Theoretical Framework

This thesis develops theoretical and empirical frameworks that study the value premium phenomenon of the Greater China stock markets in the context of Global Financial Crisis and Euro Zone Crisis. The research is carried out by mean of examining models of two competing school of thoughts, with noise as the reconciling factor between the two. The theoretical framework is built upon foundation of firstly, Thomas Kuhn's Theory of Scientific Revolutions (1996) and secondly, context as a vehicle for theory development (Johns, 2006).

The thesis derived its theoretical framework from Kuhn's argument that scientific revolutions proceed through the following stages:-

1. *Normal Science – the routine work of scientists theorising, observing, and experimenting (a "puzzle-solving" activity) under a reigning "paradigm".*
   The efficient market hypothesis (EMH) is viewed as an important pillar of modern finance (Fama, 1965 &1970). The birth of the asset pricing theory, following the development of Capital Asset Pricing Model (Sharpe,1964; Litner, 1965 and Black, 1972) has brought a new dimension in the relationship between average return and risk of financial assets and impacted the field of finance as well. Fama and MacBeth (1973) found that beta of the stocks has a roughly linear relationship with average returns. Higher beta stocks have higher average returns than lower beta stocks. Ross (1976) proposed that the arbitrage pricing theory (APT) can potentially overcome the weaknesses of the CAPM. It is argued that the expected return of an equity stock can be modeled as a linear function of various macro-economic factors. The APT is based on the law of one price and does not make any assumptions about the investor's preferences.

   Nevertheless, Fama and French (2004) argue that empirical evidence invalidates the use of CAPM in applications, after evaluating the performance of CAMP. Contrary to CAPM prediction, low beta, small or value stocks tend to produce positive abnormal returns instead. Furthermore, Fama and French developed the Three Factor Model based on empirical evidence (1992, 1993). In this model, it is argued that the sources of predictability of expected stock returns are the excess market return (MRP), a size factor (SMB) and a book-to-market equity factor

(HML), which appears to be inconsistent to the Capital Asset Pricing Model (CAPM) and Arbitrage Pricing Theory (APT). Carhart (1997) has subsequently constructed a four factor model by incorporating an additional factor – momentum. In the long run, value-stock strategies outperformed growth-stock strategies. (Fama and French, 1998,2012; Bauman et al, 2001) In 2015, Fama and French have proposed a five factor asset pricing model by adding two new factors – profitability factor (RMW) and investment factor (CMA).

The study of cross section of expected stock returns by using the Fama and French Three Factor Model and the subsequent extended model (Fama & French, 1992 & 2015) have been at the overall firm and market capitalisation classifications. Furthermore, Griffin (2002) has examined whether the Fama and French Factors are global or country specific from the market integration perspective. At the industry level, Banco et al. (2006) study the relationship between the value effect and industry affiliation. The risk measures of Banko et al. (2006) are BE/ME (book-to-market ratio), industry BE /ME (industry book-to-market ratio), ME (market capitalilsation) and beta. Clearly, the reigning paradigm is the risk based theories.

2. *An "anomaly" surfaces when a puzzle that is considered as important, in a certain way, can not be explained or solved. The anomaly can not be written off as just an ill-conceived research project*.

   Kuhn (1996) defines an anomaly as a violation of the "paradigm-induced expectations that govern normal science". It is argued that anomalies are detected through empirical analyses. The anomalies have formed the basis for most scientific discoveries. He further proposed that through the discovery of anomalies, paradigm change within a field of study could be ignited and took place. Essentially, anomalies are empirical difficulties which show the distinction between the observed and theoretically expected data

   In considering context as a vehicle for theory development, Johns (2006:386) argues that *" … the impact of context on organizational behavior is not sufficiently recognized or appreciated by researchers. … define context as situational opportunities and constraints that affect the occurrence and meaning of organizational behavior as well as functional relationships between variables."* It is argued that context can have both subtle and powerful effects on research results. As the occurrence Global Financial Crisis and Euro Zone Crisis are rare events, the financial crises can be fitted to the face of context. The three stock markets under consideration – China, Hong Kong and Taiwan, are distinct and unique in terms of history, characteristic, openness and liquidity.

The aim of the Empirical Analysis 1 is to study the risk and return relationship of value stocks and growth stocks in the context of the Greater China stock markets during the Global Financial Crisis and Euro Zone Crisis. By doing so and taking the view of context as a vehicle for theory development, the aim is to surface the anomaly. Does the market and its participants misbehave (Thaler, 2015) and not acting rationally as expected in the Greater China stock markets during two major financial crises?

3. *The anomaly opens up a "crisis" period. During this period, new methods and approaches are permitted, since the older ones have proved incapable to explain or solve the anomaly. Views and procedures previously considered heretical are temporarily allowed, in the hope of cracking the anomaly.*

In light of the occurrence of the Global Finance Crisis, Krugman (2009) wrote that "the belief in efficient financial markets blinded many if not most economists to the emergence of the biggest financial bubble in history. And efficient-market theory also played a role in inflating that bubble in the first place." Furthermore, Malkiel (2011) also mentioned that "the crisis has also shaken the foundations of modern-day financial theory, which rested on the proposition that our financial markets were basically efficient ".

Against this background, the research question of the Empirical Analysis 2 is to ask – "Do the risk factors explain value premium in the Greater China stock markets during two major financial crises?" In a separate research, Phalippou (2007) has posed the question of "can risk-based theories explain the value premium?" The result shows that some of the most prominent risk-based theories which are used to explain value premium phenomenon are at odds with data. These risk based models can capture the cross section of returns of portfolios sorted on book-to-market ratio and size, but not portfolios sorted on book-to-market ratio and institutional ownership.

By asking a similar question but in a vastly different context, the aim essentially is to assess and further investigate the relevance and validity of the risk based theory in explaining the value premium phenomenon during the two major financial crises. The risk based models which are commonly cited in the finance literature to explaining the value premium phenomenon – Banko, Conover and Jensen Model (2006), Fama and French Three Factor Model (1992,1993) and Fama and French Five Factor Model (2015) .

Banko, Conover and Jensen Model (2006)

$$R_{pt} = \alpha_0 + \beta_1 BE/ME_{pt} + \beta_2 IndBE/ME_{pt} + \beta_3 ME_{pt} + \beta_4 Beta_p + \varepsilon_{pt} \quad (1)$$

where

R_{pt} = Equally weighted monthly return on BE/ME portfolio p calculated from Jan of year t through Dec of year t.

BE/ME_{pt} = natural log of book-to-market for portfolio p.

$Ind\ BE/ME_{pt}$= natural log of book-to-market for the industry that includes portfolio p.

ME_{pt} = natural log of the market capitalization of portfolio p at Dec–end of year t-1.

$Beta_p$ = full period beta for portfolio p calculated relative to the indices of the China, Hong Kong and Taiwan Stock Exchanges.

Fama and French Three Factor Model (1992,1993)

$$R_{it} = \alpha_i + \beta_i (Rm_t - Rf_t) + \varpi_i SMB_t + \theta_i HML_t + \varepsilon_{it} \quad (2)$$

(a) R_{it} Firm stock returns (Rit) in terms of excess return have calculated as follows:-

$$R_{it} = [\{(P_{it} - P_{i,t-1}) / P_{i,t-1}\} + DY_{it}] - Rf_t$$

Where P_{it} is a closing stock price at month-end for firm *i* at time *t* and DY_{it} is the dividend yield firm *i* at year–end at time *t* and R_f is a risk-free asset proxy by the relevant twelve month Treasury bill rate. DY_{it} , however, is excluded from the calculations of R_{it} , as its magnitude is relatively insignificant as compared to changes in the closing stock prices . $(P_{pt} - P_{i,t-1})$

(b) The market return is proxies by the return of stock market indices of the relevant Stock Exchanges (HSI). The exchange market return is expressed in terms of excess returns as follows:-

$$Rm_t = [\{(HS_t - HS_{t-1}) / HS_{t-1}\}] - Rf_t$$

(c) Small minus big (SMB)

The difference between the return on a portfolio of small market capitalisation stocks and the return on a portfolio of big market capitalization stocks.

(d) High minus low (HML)

The difference between the return on a portfolio of high book-to-market stocks and the return on a portfolio of low book-to-market stocks.

<u>Fama and French Five Factor Model (2015)</u>

$$R_{it} = \alpha_i + \beta_i (Rm_t - Rf_t) + \varpi_i SMB_t + \theta_i HML_t + \kappa_i RMW_t + \lambda_i CMA_t + \varepsilon_{it} \quad (3)$$

(a) Robust minus weak (RMW)

The difference between the returns on diversified portfolios of stocks with robust and weak profitability.

b) Conservative minus aggressive (CMA)

The difference between the returns on diversified portfolios of low and high investment firms.

<u>Griffin (2002) – Market Integration</u>

In an efficient and integrated international capital market, Griffin (2002) argued that a single set of risk factor (P) is sufficient to describe expected returns in all countries.

$$R_{it} = \alpha_i + \beta_i P(Rm_t - Rf_t) + \omega_t PSMB_t + \theta_{tP} HML_t + \varepsilon_{it} \quad (4)$$

Further decomposition of the three-factor models – regional factors into domestic (D) and international (F) components is more useful in explaining the variation in the equity stock return. Hence, from this perspective, the risk model should be examined on domestic and international factors where the Greater China stock markets at the firm level are presumably integrated and efficient.

The regional factors (P) are the weighted averages (W) of the components in each of the three stock exchanges. The weighted average computation is based on the market capitalisation, with fraction attributable to the domestic market (D) and the balance attributable to the foreign market (F) capitalization at time t. Therefore,

$$P(Rm_t - Rf_t) = [(WD_t)D(Rm_t - Rf_t) + (WF_t)F(Rm_t - Rf_t)] \qquad (5)$$

Similarly, the weighted average for the regional SMB, HML, Profitability (RMW) and Investment (CMA) factors is based on their respective country specific factors.

As both the domestic and foreign factors are having a different impact on stock returns, therefore the international factor model regression is proposed for

(i) the Fama and French Three Factor Model is

$$R_{it} = \alpha_i + \beta_{Di}W_{Dt}D(Rm_t - Rf_t) + \omega_{Di}W_{Dt}DSMB_t + \theta_{Di}W_{Dt}DHML_t + \beta_{Fi}W_{Ft}F(Rm_t - Rf_t) + \varpi_{Fi}W_{Ft}FSMB_t + \theta_{Fi}W_{Ft}FHML_t + \varepsilon_{it} \qquad (6)$$

(ii) the Fama and French Five Factor Model is

$$R_{it} = \alpha_i + \beta_{Di}W_{Dt}D(Rm_t - Rf_t) + \omega_{Di}W_{Dt}DSMB_t + \theta_{Di}W_{Dt}DHML_t + \kappa_{Di}W_{Dt}DRMW_t + \lambda_{Di}W_{Dt}DCMA_t + \beta_{Fi}W_{Ft}F(Rm_t - Rf_t) + \varpi_{Fi}W_{Ft}FSMB_t + \theta_{Fi}W_{Ft}FHML_t + \kappa_{Fi}W_{Ft}FRMW + \lambda_{Fi}W_{Ft}FCMA + \varepsilon_{it} \qquad (7)$$

4. *When one of these new approaches is successful, a new paradigm emerges through a "paradigm shift".*
Following the outbreak of the Global Financial Crisis, Shefrin and Statman (2011) argue that "the crisis highlights the need to incorporate behavioral finance into our economic and financial theories". Along same line of thought, the rare occurrence of the Global Finance Crisis and Euro Zone Crisis have provided an appropriate and suitable context to reconcile volatility, as a proxy of the noise traders' risk in the financial market (De Long et al, 1990), with investor sentiment representing the behavior of investors (Barberis et. al, 1998; Shleifer, 2000; Baker and Wurgler, 2007). On the sentiment of investors, the study on the relationship of volatility, sentiment and noise traders in the closed-end investment funds of U.S market has demonstrated strong evidence of relationship between individual sentiments and increased volatility (Brown, 1999). Barbers, Odean and Zhu (2009) further demonstrated that although, the influence of one individual investor on asset prices is negligible, but the buying and selling decisions of individuals are highly correlated and they cumulate over time. Therefore, the noise traders which consist of individual investors, could potentially affect asset prices because their noise is systematic.

By constructing noise augmented asset pricing models in the Empirical Analysis 3, this research has contributed in filling the research gap. To the author's knowledge, this is one of the first attempts to quantitatively reconcile risk based models and behavioral school thought by developing parsimonious capital asset pricing models - in explaining the value premium phenomenon. Based on the work Barbel et al.(2009), investor sentiment is therefore the proxy for systematic noise. The measure of investor sentiment (INVSENT) is adapted based on the trading volume trend proposed by Baker & Stein (2004). Furthermore, Lee and Swaminathan (2000) also documented that past trading volume has provided an important link between "momentum" and "value" strategies. It is envisaged that the development of the noise-augmented asset pricing models would contribute towards the 'paradigm shift' of reconciling risk based theory and behavioral finance.

The investor sentiment (INVSENT) factor is defined as

The difference between the return on a portfolio of high trading volume trend stocks and the return on a portfolio of low trading volume trend stocks.

(i) **<u>Noise augmented asset pricing model (based on Fama and French Three Factor Model)</u>**

$$R_{it} = \alpha_i + \beta_i(Rm_t - Rf_t) + \varpi_i SMB_t + \theta_i HML_t + \rho INVSENT_t + \nu_{it} \quad (8)$$

<u>Griffin (2002) – Market Integration</u>

$$R_{it} = \alpha_i + \beta_{Di}W_{Dt}D(Rm_t - Rf_t) + \omega_{Di}W_{Dt}DSMB_t + \theta_{Di}W_{Dt}DHML_t + \beta_{Fi}W_{Ft}(Rm_t - Rf_t) + \varpi_{Fi}W_{Ft}FSMB_t + \theta_{Fi}W_{Ft}FHML_t + \rho_{Di}W_{Dt}DINVSENT_t + \rho_{Fi}W_{Ft}FINVSENT_t + \nu_{it} \quad (9)$$

(ii) **<u>Noise augmented asset pricing model (based on Fama and French Five Factor Model)</u>**

$$R_{it} = \alpha_i + \beta_i(Rm_t - Rf_t) + \varpi_i SMB_t + \theta_i HML_t + \kappa_i RMW_t + \lambda_i CMA_t + \rho INVSENT_t + \nu_{it} \quad (10)$$

<u>Griffin (2002) – Market Integration</u>

$$R_{it} = \alpha_i + \beta_{Di}W_{Dt}D(Rm_t - Rf_t) + \omega_{Di}W_{Dt}DSMB_t + \theta_{Di}W_{Dt}DHML_t + \kappa_{Di}W_{Dt}DRMW_t + \lambda_{Di}W_{Dt}DCMA_t + \beta_{Fi}W_{Ft}F(Rm_t - Rf_t) + \varpi_{Fi}W_{Ft}FSMB_t + \theta_{Fi}W_{Ft}FHML_t + \kappa_{Fi}W_{Ft}FRMW_t + \lambda_{Fi}W_{Ft}FCMA_t + \rho_{Di}W_{Dt}DINVSENT_t + \rho_{Fi}W_{Ft}FINVSEMT_t + \nu_{it} \quad (11)$$

CHAPTER 4 – EMPIRICAL ANALYSIS 1

Investigating value premium in the Greater China stock markets during two major financial crises: Some preliminary evidence

"Only when the tide goes out do you discover who's been swimming naked. "
Warren Buffet

4.1 Introduction

Little research has been carried out on the value premium phenomenon over a short term horizon with high volatility for the Greater China stock markets. Empirical works expanding from the developed markets to the more recent of emerging markets have provided evidence of value premium - that is over the long run, the value stocks have consistently yielded a higher return than the growth stocks (see for example Fama and French,1988, 1992, 1993; Davis et.al., 2000; Claessens et al., 1998; Asness et al., 2009). The value premium phenomenon is also observed in three Asian emerging markets – Hong Kong, Taiwan and Singapore (Shum and Tang, 2005). In the China market, the strong predictive power of size, price, book-to-market ratio, cash-to-price ratio and earning-to-price was found in a comprehensive analysis on the stock return predictability from January 2004 to March 2011 (Cakici et al., 2011).

On one hand, previous works (see for example Rosenberg et al., 1985; La Porta et al., 1997) have laid down the foundation on the critical issue of market efficiencies in the value stock performance. On the other hand, past research has also concentrated on the cross section of equity returns in the long run so as to provide insights on the performance of two major classifications of stocks – growth and value stocks (see for example Fama and French, 1998; Bauman et al.,2001;Cakici et al., 2011). The classification of growth and value stocks is based on certain common valuation indicators, namely book- to-market, earning-to-price, cash-to-price and dividend-to-price. In addition, empirical findings also demonstrate that small companies earn higher risk-adjusted return that their larger counterparts - the size effect (see for example Banz, 1981; Reinganum, 1981). Consequently, we have an incomplete picture of the relationship between market efficiency and time horizon.

Against this back ground, the purpose of this research is to answer the research question: "Is there value premium in the Greater China stock markets during the Global Financial Crisis and Euro Zone Crisis?" The research offers preliminary evidence on the value and size anomalies by examining the risk and return relationship of the Greater China stock markets during two major financial crises. Anomalies in finance are defined by Reilly and Brown (2006:1132) as "security price relationships that appear to contradict a well-regarded hypothesis; in this case, efficient market hypothesis". More specifically, this research has two objectives. Firstly, to assess the impact of Global Financial Crisis and Euro Zone Crisis on the performance of value stocks and growth stocks in the China, Hong Kong and Taiwan stock markets, taking into consideration overall firm and market capitalisation issues. Secondly, to examine do the standard risk measures explain the risk and return relationship of these two stock selection strategies, at overall firm and market capitalisation levels, during the Global Financial Crisis and Euro Zone Crisis.

In examining the risk and return relationship of value stocks and growth stocks of the Greater China stock markets during the two major financial crises, the preliminary evidence shows that growth stocks outperformed value stocks in the China and Hong Kong stock markets. However, value stocks still outperformed growth stocks in the Taiwan stock market. The small size effect did not diminish in the Great China stock market. Also, standard risk measures – standard deviation and Sharpe ratio do not fully explain the risk and return relationship of these two stock selection strategies.

The issue of market efficiency has become central to the value premium debate and the focal point of empirical asset pricing studies. Given the occurrence of a financial crisis is a rare event, the short term high volatility period provides an ideal window to view the behavior of value and growth investment strategies, when the market is inefficient. By examining the stock behavior during both the Global Finance Crisis and Euro Zone Crisis, this research considers the issue from a two-period framework. Another distinction between this empirical analysis and prior studies is that the scope of the research covers one country / region three stock markets. The three stock markets under consideration – China, Hong Kong and Taiwan, are distinct and unique in terms of history, characteristic, openness and liquidity. The China stock market is of 'Red-capitalism' in nature and has a large proportion of retail investors; the Hong Kong stock market is open and transparent with higher participation from the institutional investors. Last but not least, the Taiwan market is between the two spectrums of the China and Hong Kong stock markets. Therefore, this research fills the gap.

4.2 Data Selection and Description of Data

The data for the Greater China stock markets, which comprise of China, Hong Kong and Taiwan stock markets are collected from the Data Stream Database. The data covers monthly firm's stock prices and firm's financial characteristics, such as price-to-book value, price-to-earning value, price-to-cash value, dividend yield and number of shares. All data set are spanning from December 2007 to June 2012.

The stock market indices data are collected from Yahoo Finance spanning from December 2007 to June 2012. CSI 300 Index, which is a capitalisation-weighted stock market index designed to replicate the performance of 300 stocks traded in the Shanghai and Shenzhen stock exchanges, is used for China stock markets. Hang Seng Index and Taiwan Stock Exchange Weighted Index are used for Hong Kong and Taiwan stock markets respectively. Risk free rates data for China, Hong Kong and Taiwan are collected from CEIC Data for December 2007 to June 2012.

As the Dow Jones Industrial Average fell from the peak of 14,000 in October 2007 to just over 8,000, after a sharp decline of more than 40% in the early October 2008, this signifies the beginning of the global financial crisis. Alongside the Dow, major stock markets in other countries have plunged as well. According to the U.S. National Bureau of Economic Research (NBER), the recession ended in June 2009. In the context of this investigation, data from December 2007 to December 2010 are used for Global Financial Crisis, covers a 36 months period. Whereas data from November 2009 to June 2012 are used for Euro Zone Crisis, cover a 32 months period.

The data set consists of 1,321, 1,128 and 1,409 companies listed on the China, Hong Kong and Taiwan stock markets respectively (the population size). The company data are grouped based on Global Industry Classification Sectors (GICS), such as capital goods, consumer durables and apparel, consumer services, diversified financials, materials, real estate, retailing, software and services as well as technology hardware and equipment. However, some 106, 386 and 405 companies of the China, Hong Kong and Taiwan stock markets are excluded from the analysis due to various reasons such as delisting, incomplete data and listed after the “formation period” for the value and growth stocks classification.

4.3 Methodology

In order to assess the impact of Global Financial Crisis and Euro Zone Crisis on the performance of value stocks and growth stocks in the China, Hong Kong and Taiwan stock markets, the value and growth stocks are classified on the basis of four valuation ratio measures, i.e. book-to market (B/M) ratio, earnings-to-price (E/P) ratio, cash-to-price (C/P) ratio and dividend-to-price (D/P) ratio. The stock prices are used to ascertain the average raw excess (of the 1 month risk free rate) return and the t-statistics of the returns in each stock market for both of the financial crises separately. For simplicity and clarity reasons, the calculation of the average raw excess (of the 1 month risk free rate) return does not include dividend income. For each of the four quartiles under the four valuation ratios – B/M, E/P, C/P and D/P, the equal-weighted (EM) mean in terms of percentage are calculated.

The valuation ratios are calculated based on the date of the company's portfolio formation. The four valuation ratios measures, i.e. B/M, E/P, C/P and D/P, are calculated using as price-to-book value, price-to-earning value, price-to-cash value and dividend yield as three months after the fiscal year-end. Fama and French (1998) proposed that the value portfolio include firms whose ratios (B/M, E/P, C/P or D/P) are among the highest for a given country, whereas growth portfolios include firms with the lowest ratios. Consistent with this definition, the stocks formed using the four valuations were divided into four quartiles for the determination of value and growth stocks. The data with the lowest B/M, E/P, C/P and D/P values were classified into growth stocks (Quartiles 1 and 2), whereas samples with higher values of B/M, E/P, C/P and D/P were classified as value stocks (Quartiles 3 & 4).

The standard deviation and Sharper ratio are used to offer preliminary evidence as to whether or not standard risk measures explain the risk and return relationship of these two stock selection strategies in the context of the Global Financial Crisis and Euro Zone Crisis. The standard deviation is calculated as the standard risk measure of average raw excess (of the 1 month risk free rate) return. In addition, Sharpe ratio is also computed as another standard risk measure. According to Reilly and Brown (2006), Sharper ratio is a relative measure of a portfolio's benefit-to-risk ratio, calculated as its average return in excess of the risk-free rate divided by the standard deviation of portfolio returns. Finally, Alphas and their t-statistics are also determined. Alpha is the difference between the actual and expected return of a portfolios at a given risk level.

In order to consider the market capitalisation issue for each of the two financial crises, the methodology described above is repeated. Each stock market is divided into four main sub-categories, ascending from the smallest to the largest, based on the equal value weighted market capitalisation.

4.4 Empirical Results and Analysis – Global Financial Crisis and Euro Zone Crisis

Table 1 summarises the characteristics of the samples in the China, Hong Kong and Taiwan stock markets for the Global Financial Crisis and Euro Zone Crisis. Panel A shows the number of firms for each stock market at the beginning of each financial crisis. Panel B shows the size (market capitalization, price times share outstanding) of firms in the market. Panel C shows the equal weighted average of B/M for each of the stock market.

Table 1

Some Characteristics of the Stock Market Samples

Summarises the characteristics of the samples in the China, Hong Kong and Taiwan stock markets for the Global Financial Crisis and Euro Zone Crisis. Panel A shows the number of firms for each stock market at the beginning of each financial crisis. Panel B shows the size (market capitalization, price times share outstanding) of firms in the market. Panel C shows the equal weighted average of B/M for each of the stock market.

	China	Hong Kong	Taiwan
	Panel A: Number of Firms in Stock Market		
Global Financial Crisis	1,210	742	1,004
Euro Zone Crisis	1,215	742	1,004
	Panel B: Size (market capitalisation, $ million)		
Global Financial Crisis	117,959	34,936	34,836
Euro Zone Crisis	109,498	37,168	40,574
	Panel C: Equal - Weighted Average Book-to-Market Equity (B/M)		
Global Financial Crisis	0.28	1.03	0.74
Euro Zone Crisis	0.27	1.06	0.77

Table 2 and Table 3 report the annualised mean return, t-statistics of the mean, standard deviation and the Sharpe ratio for the growth and value stocks of the China, Hong Kong and Taiwan stock markets for the Global Financial Crisis and Euro Zone Crisis. Also reported are the alphas and their t-statistics.

Panels A, B, C and D of the Table 2 and Table 3 present the results based on four valuation ratios – book-to-market, earnings-to-price, cash-to-price and dividend-to-price respectively.

Table 2

Performance of Value and Growth Stocks during Global Financial Crisis

Reported are the annualised mean return, t-statistics of the mean, standard deviation and the Sharpe ratio for the growth and value stocks of the China, Hong Kong and Taiwan stock markets for the Global Financial Crisis. Also reported are the alphas and their t-statistics. Panels A, B, C and D present the results based on four valuation ratios – book-to-market, earnings-to-price, cash-to-price and dividend-to-price respectively.

	Panel A:	Individual Stock Portfolios - Book to Market			
	Growth Stocks		Value Stocks		Spread between
	1stQ	2nd Q	3rd Q	4th Q	1st and 4th quartiles
H.K. Stocks					
Mean	2.30	1.49	1.58	1.95	0.35
(t-stat)	(3.90)	(17.50)	(19.70)	(9.50)	(0.57)
Stdev	10.11	1.47	1.38	3.51	10.69
Sharpe	0.23	1.02	1.15	0.55	0.03
Alpha	2.36	1.55	1.65	2.01	0.35
(t-stat)	(4.00)	(18.20)	(20.50)	(9.80)	(0.57)
China Stocks					
Mean	1.77	1.54	1.68	1.62	0.15
(t-stat)	(13.50)	(13.60)	(16.30)	(10.50)	(0.72)
Stdev	2.21	1.92	1.75	2.62	3.45
Sharpe	0.80	0.80	0.96	0.62	0.04
Alpha	2.06	1.83	1.98	1.91	0.15
(t-stat)	(15.80)	(16.20)	(19.10)	(12.40)	(0.72)
Taiwan Stocks					
Mean	1.87	2.22	2.44	3.20	-1.33
(t-stat)	(8.20)	(9.50)	(15.20)	(13.30)	(-3.85)
Stdev	3.54	3.63	2.51	3.74	5.38
Sharpe	0.53	0.61	0.97	0.85	-0.25
Alpha	1.28	1.63	1.85	2.61	-1.33
(t-stat)	(5.60)	(7.00)	(11.50)	(10.90)	(-3.85)

Table 2 – Continued

Panel B: Individual Stock Portfolios - Earnings to Price

	Growth Stocks 1st Q	2nd Q	Value Stocks 3rd Q	4th Q	Spread between 1st and 4th quartiles
H.K. Stocks					
Mean	2.48	2.95	1.76	2.84	-0.35
(t-stat)	(5.60)	(4.20)	(5.00)	(4.60)	(-0.44)
Stdev	4.42	6.98	3.47	6.06	7.90
Sharpe	0.56	0.42	0.51	0.47	-0.04
Alpha	2.71	3.17	1.98	3.06	-0.35
(t-stat)	(6.10)	(4.50)	(5.70)	(5.00)	(-0.44)
China Stocks					
Mean	1.77	1.81	1.96	0.97	0.80
(t-stat)	(12.80)	(16.00)	(8.60)	(7.80)	(4.20)
Stdev	2.22	1.82	3.64	1.98	3.07
Sharpe	0.80	1.00	0.54	0.49	0.26
Alpha	2.06	2.10	2.26	1.26	0.80
(t-stat)	(14.90)	(18.60)	(9.90)	(10.20)	(4.20)
Taiwan Stocks					
Mean	2.67	2.11	1.90	1.63	1.04
(t-stat)	(13.90)	(10.80)	(13.20)	(10.90)	(4.46)
Stdev	2.69	2.72	2.02	2.10	3.29
Sharpe	0.99	0.77	0.94	0.78	0.32
Alpha	2.05	1.49	1.28	1.01	1.04
(t-stat)	(10.70)	(7.60)	(8.90)	(6.70)	(4.45)

Panel C: Individual Stock Portfolios - Cash to Price

	Growth Stocks 1st Q	2nd Q	Value Stocks 3rd Q	4th Q	Spread between 1st and 4th quartiles
H.K. Stocks					
Mean	5.55	3.33	1.57	2.57	2.98
(t-stat)	(8.90)	(5.70)	(8.00)	(10.30)	(4.50)
Stdev	8.37	7.75	2.64	3.34	8.94
Sharpe	0.66	0.43	0.59	0.77	0.33
Alpha	5.78	3.55	1.79	2.80	2.98
(t-stat)	(9.30)	(6.10)	(9.10)	(11.30)	(4.50)

Table 2 – Continued

China Stocks					
Mean	1.39	1.59	1.80	1.99	-0.59
(t-stat)	(12.70)	(15.50)	(14.10)	(11.70)	(2.99)
Stdev	1.80	1.68	2.10	2.77	3.27
Sharpe	0.77	0.95	0.86	0.72	-0.18
Alpha	1.69	1.88	2.09	2.28	-0.59
(t-stat)	(15.30)	(18.40)	(16.40)	(13.50)	(-2.99)
Taiwan Stocks					
Mean	1.95	2.02	2.41	2.90	-0.95
(t-stat)	(10.10)	(9.50)	(8.90)	(12.70)	(-3.16)
Stdev	2.76	3.03	3.86	3.27	4.32
Sharpe	0.71	0.67	0.62	0.89	-0.22
Alpha	1.34	1.41	1.80	2.29	(0.95)
(t-stat)	(7.00)	(6.70)	(6.70)	(10.10)	(-3.16)

Panel D: Individual Stock Portfolios - Dividend to Price

	Growth Stocks 1st Q	2nd Q	Value Stocks 3rd Q	4th Q	Spread between 1st and 4th quartiles
H.K. Stocks					
Mean	7.54	3.56	1.75	1.65	5.89
(t-stat)	(6.10)	(7.50)	(6.80)	(7.60)	(4.68)
Stdev	16.45	6.39	3.45	2.90	16.93
Sharpe	0.46	0.56	0.51	0.57	0.35
Alpha	7.77	3.79	1.98	1.87	5.90
(t-stat)	(6.30)	(7.90)	(7.60)	(8.60)	(4.68)
China Stocks					
Mean	2.18	2.76	1.46	1.26	0.92
(t-stat)	(10.30)	(4.40)	(14.70)	(11.30)	(4.01)
Stdev	3.60	10.67	1.70	1.89	3.92
Sharpe	0.60	0.26	0.86	0.66	0.23
Alpha	2.47	3.05	1.76	1.55	0.92
(t-stat)	(11.70)	(4.80)	(17.60)	(14.00)	(4.01)
Taiwan Stocks					
Mean	3.47	2.48	2.18	3.94	1.83
(t-stat)	(33.00)	(11.50)	(8.70)	(34.60)	(6.75)
Stdev	1.64	3.37	3.91	1.78	4.25
Sharpe	2.11	0.74	0.56	2.21	0.43
Alpha	2.88	1.89	1.59	1.05	1.83
(t-stat)	(11.40)	(8.70)	(6.30)	(9.20)	(6.75)

Table 3

Performance of Value and Growth Stocks during Euro Zone Crisis

Reported are the annualised mean return, t-statistics of the mean, standard deviation and the Sharpe ratio for the growth and value stocks of the China, Hong Kong and Taiwan stock markets for the Euro Zone Crisis. Also reported are the alphas and their t-statistics. Panels A, B, C and D present the results based on four valuation ratios – book-to-market, earnings-to-price, cash-to-price and dividend-to-price respectively.

	Panel A:	Individual Stock Portfolios - Book to Market			
	Growth Stocks		Value Stocks		Spread between
	1st[t]Q	2nd Q	3rd Q	4th Q	1st and 4th quartiles
H.K. Stocks					
Mean	2.35	2.62	0.80	1.87	0.47
(t-stat)	(3.00)	(2.50)	(3.80)	(2.60)	(0.44)
Stdev	10.05	13.39	2.67	9.27	13.72
Sharpe	0.23	0.20	0.30	0.20	0.03
Alpha	2.37	2.64	0.82	1.89	0.47
(t-stat)	(3.00)	(2.50)	(3.90)	(2.60)	(0.44)
China Stocks					
Mean	0.61	0.38	-0.03	-0.03	0.64
(t-stat)	(4.20)	(2.20)	(-0.20)	(-0.20)	(3.34)
Stdev	2.50	2.92	1.63	2.29	3.31
Sharpe	0.25	0.13	-0.02	-0.01	0.19
Alpha	0.90	0.67	0.26	0.26	0.64
(t-stat)	(6.20)	(3.90)	(2.70)	(1.90)	(3.34)
Taiwan Stocks					
Mean	0.33	0.44	0.70	0.98	-0.65
(t-stat)	(1.70)	(2.90)	(5.20)	(8.30)	(-3.19)
Stdev	2.94	2.37	2.12	1.84	3.19
Sharpe	0.11	0.19	0.33	0.53	-0.20
Alpha	0.55	0.66	0.92	1.19	(0.65)
(t-stat)	(2.90)	(4.30)	(6.70)	(10.10)	(-3.19)

Table 3 – Continued

	Panel B:	Individual Stock Portfolios - Earnings to Price			
	Growth Stocks		Value Stocks		Spread between
	1st Q	2nd Q	3rd Q	4th Q	1st and 4th quartiles
H.K. Stocks					
Mean	1.09	0.53	1.91	0.65	0.44
(t-stat)	(2.90)	(2.40)	(1.20)	(2.90)	(1.05)
Stdev	3.83	2.20	16.14	2.22	4.32
Sharpe	0.28	0.24	0.12	0.29	0.10
Alpha	1.11	0.55	1.93	0.67	0.44
(t-stat)	(2.90)	(2.50)	(1.20)	(3.00)	(1.05)
China Stocks					
Mean	0.49	0.47	-0.01	-0.20	0.69
(t-stat)	(2.40)	(3.40)	(-0.10)	(-1.60)	(2.88)
Stdev	3.07	2.18	1.53	1.97	3.77
Sharpe	0.16	0.22	-0.01	-0.10	-0.78
Alpha	0.78	0.76	0.28	0.09	0.69
(t-stat)	(3.90)	(5.50)	(2.80)	(0.60)	(2.88)
Taiwan Stocks					
Mean	0.54	0.57	0.52	0.40	0.14
(t-stat)	(3.50)	(2.60)	(3.80)	(3.00)	(0.71)
Stdev	2.11	2.99	1.89	1.82	2.66
Sharpe	0.25	0.19	0.28	0.22	0.05
Alpha	0.75	0.79	0.74	0.62	0.13
(t-stat)	(5.00)	(3.70)	(5.40)	(4.70)	(0.71)

Table 3 – Continued

	Panel C:	Individual Stock Portfolios - Cash to Price			
	Growth Stocks		Value Stocks		Spread between
	1st Q	2nd Q	3rd Q	4th Q	1st and 4th quartiles
H.K. Stocks					
Mean	3.68	2.14	0.52	1.80	1.88
(t-stat)	(4.50)	(1.90)	(3.20)	(7.10)	(2.15)
Stdev	10.95	14.77	2.15	3.40	11.81
Sharpe	0.34	0.15	0.24	0.53	0.16
Alpha	3.70	2.17	0.54	1.82	1.88
(t-stat)	(4.50)	(1.90)	(3.40)	(7.20)	(2.15)
China Stocks					
Mean	0.32	0.13	0.24	0.20	0.12
(t-stat)	(1.70)	(1.30)	(2.20)	(1.40)	(0.51)
Stdev	3.06	1.67	1.81	2.38	3.79
Sharpe	0.10	0.08	0.13	0.09	0.03
Alpha	0.61	0.42	0.53	0.49	0.12
(t-stat)	(3.30)	(4.20)	(4.90)	(3.50)	(0.52)
Taiwan Stocks					
Mean	0.01	0.10	0.83	1.46	-1.45
(t-stat)	(0.00)	(0.80)	(3.90)	(10.60)	(-6.95)
Stdev	2.24	1.77	3.15	2.03	3.08
Sharpe	0.00	0.06	0.26	0.72	-0.47
Alpha	0.22	0.30	1.04	1.66	-1.45
(t-stat)	(1.40)	(2.50)	(4.80)	(12.10)	(-6.94)

Table 3 – Continued

	Panel D:	Individual Stock Portfolios - Dividend to Price			
	Growth Stocks		Value Stocks		Spread between1st Q
	1stQ	2nd Q	3rd Q	4th Q	1st and 4th quartiles
H.K. Stocks					
Mean	3.96	3.04	0.41	1.39	2.57
(t-stat)	(3.70)	(3.30)	(2.40)	(2.80)	(2.21)
Stdev	13.98	12.26	2.20	6.61	15.60
Sharpe	0.28	0.25	0.19	0.21	0.16
Alpha	3.97	3.06	0.42	1.40	2.57
(t-stat)	(3.80)	(3.30)	(2.50)	(2.80)	(2.21)
China Stocks					
Mean	0.38	0.52	0.23	-0.09	0.47
(t-stat)	(2.60)	(2.80)	(1.90)	(-0.90)	(2.64)
Stdev	2.55	3.24	2.04	1.74	3.15
Sharpe	0.15	0.16	0.11	-0.05	0.15
Alpha	0.67	0.81	0.52	0.20	0.47
(t-stat)	(4.60)	(4.30)	(4.40)	(2.00)	(2.64)
Taiwan Stocks					
Mean	0.97	0.15	2.79	1.24	-0.27
(t-stat)	(5.30)	(5.30)	(21.90)	(5.60)	(-0.92)
Stdev	2.85	0.44	2.00	3.45	4.63
Sharpe	0.34	0.34	1.39	0.36	-0.06
Alpha	1.19	0.36	0.65	1.46	-0.27
(t-stat)	(6.50)	(2.00)	(5.10)	(6.60)	(-0.92)

4.4.1. Stock Performance - China, Hong Kong & Taiwan stock markets – Global Financial Crisis

During the Global Financial Crisis, the growth stocks outperformed value stocks significantly in the China and Hong Kong stock markets. However, value stocks outperformed growth stocks in the Taiwan stock market during the same period.

With the exception of cash-to-price ratio, growth stocks performed better than the value stocks for all valuation ratios in the China stock market. The mean return of the growth stocks (the 1st quartile) are 1.77, 1.77 and 2.18 respectively under the book-to-market, earnings-to-price and dividend-to-price ratios, whereas the mean return of the value stocks (the 4th quartile) are 1.62, 0.97 and 1.26 respectively under the same valuation ratios. From the analysis, the spread between the first and fourth quartiles of the mean returns and Alphas are about 0.8 to 0.9 under the earnings-to-price and dividend-to-price valuation ratios. However, the standard deviation and Sharpe ratios are unstable. This is especially that for all the four valuation ratios, the Sharpe ratio is less stable, contradicts with the notion that the greater the value of the Sharpe ratio, the more attractive the risk-adjusted return.

In the Hong Kong stock market, growth stocks also performed better than the value stocks for all valuation ratios and with significant t-statistics for the same period, except the earnings-to-price ratio. The mean return of the growth stocks (the 1st quartile) of the Hong Kong stock market are 2.30, 5.55 and 7.54 respectively under the book-to-market, cash-to-price and dividend-to-price ratios, higher than the mean return of the value stocks (the 4th quartile) of 1.95, 2.57 and 1.65 respectively under the same valuation ratios. For instance, under the cash-to-price and dividend-to-price valuation ratios, the spread between the first and fourth quartiles of the mean returns and Alphas are about 3 and 6 respectively. Similar behavior pattern of the Sharpe ratios is observed as in the case of China stock market. The Sharpe ratio does not explain the risk and return relationship of the portfolio, inconsistent with the principle embodied in the traditional finance.

The research has discovered that in the Taiwan stock market, value stocks outperformed the growth stocks under the book-to-market, cash-to-price and dividend-to-price valuation ratios during the Global Financial Crisis. During the Global Financial Crisis, the mean return of the value stocks (the 4th quartile) of the Taiwan stock market are 3.20, 2.90 and 3.94 respectively under the book-to-market, cash-to-price and dividend-to-price ratios are higher than the mean return of the growth stocks (the 1st quartile) of 1.87, 1.95 and 3.47 respectively under the same valuation ratios. The standard risk measures - standard deviation and Sharpe ratio are unstable during this period. For instance, the relationship between the standard deviation and mean is inconsistent especially under the book-to-market and cash-to-price valuation ratios.

4.4.2. Stock Performance - China, Hong Kong & Taiwan stock markets – Euro Zone Crisis

During the Euro Zone Crisis, the growth stocks outperformed value stocks significantly in the China and Hong Kong stock markets. However, the Taiwan stock market has shown a contrasting result where the value stocks outperformed growth stocks during the same period.

In the China stock market, growth stocks performed better than the value stocks for all valuation ratios, except the cash-to-price ratio. The mean return of the growth stocks (the 1st quartile) are 0.61, 0.49, 0.32 and 0.38 respectively under the book-to-market, earnings-to-price, cash-to-price and dividend-to-price ratios, whereas the mean return of the value stocks (the 4th quartile) are -0.03. -0.20, 0.20 and -0.09 respectively. Value stocks have negative means under the book-to-market, earnings-to-price and dividend-to-price valuation ratios. With the exception of cash-to-price ratio, unstable standard deviation once again is observed.

With the exception of the earnings-to-price ratio, growth stocks also performed better than the value stocks for all valuation ratios and with significant t-statistics in the Hong Kong stock market. The mean return of the growth stocks (the 1st quartile) of the Hong Kong stock market are 2.35, 1.09, 3.68 and 3.96 respectively under the book-to-market, earnings-to-price, cash-to-price and dividend-to-price ratios during the Euro Zone Crisis, higher than the mean return of the value stocks (the 4th quartile) of 1.87, 0.65, 1.80 and 1.39 respectively under the same valuation ratios. The spread between the first and fourth quartiles of the mean returns and Alphas is between 0.5 to 2.5 range for the four valuation ratios. The Sharpe ratio is rather unstable during the Euro Zone Crisis, exhibiting the abnormal risk and return relationship for the value and growth stocks.

In contrast, the value stocks outperformed growth stocks during the Euro Zone Crisis in the Taiwan stock market, except the earnings-to-price ratio. The mean return of the growth stocks (the 1st quartile) are 0.33, 0.54, 0.01 and 0.97 respectively under the book-to-market, earnings-to-price, cash-to-price and dividend-to-price ratios, whereas the mean return of the value stocks (the 4th quartile) are 0.98, 0.40, 1.46 and 1.24 respectively. As for the risk and return relationship, standard deviation and Sharpe ratio are unstable. For instance, value stocks in the fourth quartile which have a mean of 0.98 and standard deviation of 1.84 as compared to growth stocks in the first quartile which have a mean of 0.33 and standard deviation of 2.94.

4.4.3. Stock Performance by market capitalisation - China, Hong Kong & Taiwan stock markets – Global Financial Crisis

Table 4, Table 5 and Table 6 report the annualised mean return, t-statistics of the mean, standard deviation and the Sharpe ratio for the growth and value stocks of the China, Hong Kong and Taiwan stock markets by market capitalisation respectively for the Global Financial Crisis. Also reported are the alphas and their t-statistics. Each stock market is divided into four main sub-categories, ascending from the smallest to the biggest, based on equal weighted market capitalization. Panels A, B, C and D present the results based on four valuation ratios – book-to-market, earnings-to-price, cash-to-price and dividend-to-price respectively.

Further examination and analysis in the China stock market has revealed that the performance of small market capitalisation stocks is better than big capitalisation stocks in three out of four valuation ratios. On the one hand, small market capitalisation stocks performed better than the big market capitalization stocks for the book-to-market, earnings-to-price and cash-to-price valuation ratios. For instance, under the book-to-market valuation ratio, the mean return of the small market capitalisation portfolios (A-smallest) is in the range of 2.29 to 2.95 and big market capitalsation portfolios (D-biggest) is in the range 0.65 to 1.64. Whereas under the cash-to-price valuation ratios, the mean return of the small market capitalisation portfolios (A-smallest) is in the range of 2.07 to 3.88 and big market capitalsation portfolios (D-biggest) is in the range 0.44 to 0.87.

On the other hand, big market capitalisation stocks performed better than small market capitalisation stocks for the dividend-to-market valuation ratio. Under the dividend-to-market valuation ratio, the mean return of the small market capitalisation portfolios (A-smallest) is in the range of 1.51 to 1.91 and big market capitalsation portfolios (D-biggest) is in the range 0.20 to 5.33.

For small market capitalisation, however, value stocks performed better than the growth stocks under all valuation ratios. Positive mean (raw excess returns) and alpha are observed, with significant t-statistics. However, the standard deviation and Sharpe ratio are unstable for all the valuation ratios.

Table 4
Performance of Value and Growth Stocks by Market Capitalisation during Global Financial Crisis – China

Reported are the annualised mean return, t-statistics of the mean, standard deviation and the Sharpe ratio for the growth and value stocks of the China stock market by market capitalisation respectively for the Global Financial Crisis. Also reported are the alphas and their t-statistics. Each stock market is divided into four main sub-categories, ascending from the smallest to the biggest, based on the equal weighted market capitalization. Panels A, B, C and D present the results based on four valuation ratios – book-to-market, earnings-to-price, cash-to-price and dividend-to-price respectively.

	Panel A:	Individual Stock Portfolios - Book to Market			
	Growth Stocks		Value Stocks		Spread between
	1st Q	2nd Q	3rd Q	4th Q	1st and 4th quartiles
A - Smallest					
Mean	2.29	2.54	2.40	2.95	-0.66
(t-stat)	(5.80)	(10.10)	(11.20)	(8.30)	(-1.27)
Stdev	3.08	1.97	1.67	2.80	4.10
Sharpe	0.74	1.29	1.43	1.06	-0.16
Alpha	2.64	2.82	2.67	3.21	4.10
(t-stat)	(6.70)	(11.20)	(12.50)	(9.00)	(-1.09)
B					
Mean	1.87	1.95	2.13	2.39	-0.52
(t-stat)	(9.10)	(8.80)	(12.20)	(7.40)	(-1.42)
Stdev	1.74	1.88	1.49	2.76	3.13
Sharpe	1.08	1.04	1.43	0.87	-0.17
Alpha	2.15	2.22	2.43	2.68	-0.53
(t-stat)	(10.50)	(10.00)	(13.80)	(8.20)	(-1.44)
C					
Mean	1.32	1.20	1.64	1.64	-0.32
(t-stat)	(6.30)	(5.90)	(9.10)	(7.60)	(-1.08)
Stdev	1.80	1.75	1.55	1.86	2.55
Sharpe	0.73	0.69	1.06	0.88	-0.13
Alpha	1.61	1.49	1.95	1.94	-0.33
(t-stat)	(7.70)	(7.30)	(10.80)	(9.00)	(-1.12)
D - Biggest					
Mean	1.32	0.65	0.69	1.64	-0.32
(t-stat)	(6.30)	(3.40)	(3.40)	(7.60)	(-1.08)
Stdev	1.80	1.65	1.73	1.86	2.55
Sharpe	0.73	0.39	0.40	0.88	-0.13
Alpha	1.62	0.96	1.01	0.26	1.36
(t-stat)	(8.00)	(5.00)	(5.00)	(1.00)	(4.01)

Table 4 – Continued

	Panel B:	Individual Stock Portfolios - Earnings to Price			
	Growth Stocks		Value Stocks		Spread between
	1st Q	2nd Q	3rd Q	4th Q	1st and 4th quartiles
A – Smallest					
Mean	2.10	2.13	3.40	2.60	-0.50
(t-stat)	(6.90)	(9.30)	(3.50)	(9.60)	(-1.20)
Stdev	2.23	1.68	7.14	1.98	3.09
Sharpe	0.94	1.27	0.48	1.31	-0.16
Alpha	2.38	2.41	3.68	2.86	-0.48
(t-stat)	(7.80)	(10.50)	(3.70)	(10.50)	(-1.13)
B					
Mean	2.32	2.34	1.83	0.44	0.44
(t-stat)	(6.50)	(9.40)	(10.20)	(1.00)	(1.07)
Stdev	2.82	1.98	1.43	3.27	3.27
Sharpe	0.82	1.18	1.29	0.13	0.13
Alpha	2.61	2.62	2.11	2.16	0.46
(t-stat)	(7.40)	(10.60)	(11.80)	(12.10)	(1.12)
C					
Mean	1.36	1.65	1.90	0.98	0.39
(t-stat)	(5.70)	(8.40)	(9.50)	(6.80)	(1.43)
Stdev	1.97	1.61	1.63	1.17	2.24
Sharpe	0.69	1.02	1.16	0.83	0.17
Alpha	1.65	1.94	2.17	1.29	0.37
(t-stat)	(6.90)	(9.90)	(10.90)	(9.00)	(1.35)
D – Biggest					
Mean	0.97	0.93	0.86	-0.09	1.06
(t-stat)	(4.60)	(4.50)	(3.20)	(-0.40)	(3.63)
Stdev	1.76	1.72	2.21	1.72	2.46
Sharpe	0.55	0.54	0.39	-0.06	0.43
Alpha	1.27	1.20	1.20	0.23	1.04
(t-stat)	(6.00)	(5.80)	(4.50)	(1.10)	(3.55)

Table 4 – Continued

	Panel C:	Individual Stock Portfolios - Cash to Price			
	Growth Stocks 1st Q	2nd Q	Value Stocks 3rd Q	4th Q	Spread between 1st and 4th quartiles
A - Smallest					
Mean	2.14	2.07	2.68	3.88	-1.74
(t-stat)	(8.50)	(9.70)	(12.50)	(8.20)	(-3.16)
Stdev	1.88	1.60	1.62	3.57	4.15
Sharpe	1.14	1.29	1.66	1.09	-0.42
Alpha	2.42	2.33	2.95	4.23	-1.82
(t-stat)	(9.70)	(11.00)	(13.70)	(8.90)	(-3.30)
B					
Mean	1.80	1.94	2.42	2.44	-0.64
(t-stat)	(9.10)	(9.70)	(8.50)	(8.00)	(-1.91)
Stdev	1.62	1.62	2.31	2.49	2.77
Sharpe	1.11	1.19	1.05	0.98	-0.23
Alpha	2.10	2.20	2.70	2.71	-0.61
(t-stat)	(10.60)	(11.10)	(9.50)	(8.90)	(-1.82)
C					
Mean	1.56	1.47	1.36	2.14	-0.58
(t-stat)	(7.80)	(7.50)	(7.60)	(8.70)	(-1.73)
Stdev	1.67	1.64	1.48	2.03	2.79
Sharpe	0.93	0.90	0.92	1.05	-0.21
Alpha	1.87	1.75	1.64	2.43	-0.55
(t-stat)	(9.30)	(8.90)	(9.20)	(9.90)	(-1.66)
D - Biggest					
Mean	0.44	0.69	0.73	0.87	-0.43
(t-stat)	(2.10)	(3.60)	(2.40)	(3.60)	(-1.28)
Stdev	1.72	1.64	2.27	2.01	2.86
Sharpe	0.26	0.42	0.32	0.43	-0.15
Alpha	0.76	0.97	1.04	1.19	-0.43
(t-stat)	(3.70)	(5.00)	(3.90)	(5.00)	(-1.28)

Table 4 – Continued

Panel D:	Individual Stock Portfolios - Dividend to Price				
	Growth Stocks		Value Stocks		Spread between
	1st Q	2nd Q	3rd Q	4th Q	1st and 4th quartiles
A – Smallest					
Mean	1.51	1.80	1.54	1.91	-0.40
(t-stat)	(5.80)	(6.80)	(8.90)	(10.60)	(-1.33)
Stdev	2.19	2.24	1.46	1.52	2.59
Sharpe	0.69	0.81	1.05	1.26	-0.16
Alpha	1.75	2.07	1.82	2.17	-0.42
(t-stat)	(6.70)	(7.80)	(10.50)	(12.10)	(-1.38)
B					
Mean	1.81	2.20	1.89	2.01	-0.19
(t-stat)	(10.40)	(6.90)	(7.80)	(12.10)	(-0.86)
Stdev	1.50	2.71	2.07	1.42	1.95
Sharpe	1.21	0.81	0.91	1.41	-0.10
Alpha	2.11	2.48	2.18	2.28	-0.18
(t-stat)	(12.00)	(7.80)	(9.00)	(13.70)	(-0.78)
C					
Mean	2.56	2.19	1.58	1.54	1.01
(t-stat)	(3.70)	(6.10)	(8.70)	(6.60)	(-2.36)
Stdev	5.90	3.10	1.56	2.02	6.40
Sharpe	0.43	0.71	1.01	0.76	16%
Alpha	2.85	2.49	1.86	1.82	1.03
(t-stat)	(4.10)	(6.90)	(10.30)	(7.70)	(1.40)
D – Biggest					
Mean	5.33	1.27	1.08	0.20	5.12
(t-stat)	(2.30)	(5.30)	(4.50)	(0.90)	(2.19)
Stdev	20.29	2.08	2.10	1.91	20.50
Sharpe	0.26	0.61	0.52	0.11	0.25
Alpha	5.73	1.58	1.40	0.50	5.22
(t-stat)	(2.40)	(6.60)	(5.80)	(2.30)	(2.24)

Table 5
Performance of Value and Growth Stocks by Market Capitalisation during Global Financial Crisis – Hong Kong

Reported are the annualised mean return, t-statistics of the mean, standard deviation and the Sharpe ratio for the growth and value stocks of the Hong Kong stock market by market capitalisation respectively for the Global Financial Crisis. Also reported are the alphas and their t-statistics. Each stock market is divided into four main sub-categories, ascending from the smallest to the biggest, based on the equal weighted market capitalisation. Panels A, B, C and D present the results based on four valuation ratios – book-to-market, earnings-to-price, cash-to-price and dividend-to-price respectively.

	Panel A:	Individual Stock Portfolios - Book to Market			
	Growth Stocks		Value Stocks		Spread between
	1stQ	2nd Q	3rd Q	4th Q	1st and 4th quartiles
A - Smallest					
Mean	2.33	1.94	1.67	2.42	-0.09
(t-stat)	(7.90)	(10.60)	(10.50)	(7.60)	(-0.20)
Stdev	2.48	1.53	1.33	2.66	3.73
Sharpe	0.94	1.27	1.25	0.91	-0.02
Alpha	2.53	1.96	1.73	2.42	0.11
(t-stat)	(8.60)	(10.70)	(10.80)	(7.60)	(0.25)
B					
Mean	2.10	1.88	1.68	2.10	-0.01
(t-stat)	(7.90)	(11.80)	(12.10)	(9.40)	(-0.02)
Stdev	2.26	1.36	1.19	1.91	2.97
Sharpe	0.93	1.38	1.42	1.10	0.00
Alpha	2.18	1.95	1.72	2.12	0.06
(t-stat)	(8.20)	(12.20)	(12.50)	(9.50)	(0.18)
C					
Mean	1.25	1.48	1.82	1.93	-0.68
(t-stat)	(7.10)	(8.00)	(12.70)	(7.00)	(-2.05)
Stdev	1.50	1.59	1.23	2.36	2.86
Sharpe	0.84	0.93	1.48	0.82	-0.24
Alpha	1.30	1.54	1.90	2.02	-0.71
(t-stat)	(7.40)	(8.30)	(13.20)	(7.30)	(-2.15)
D – Biggest					
Mean	1.04	0.87	1.27	0.82	0.23
(t-stat)	(6.90)	(6.20)	(7.30)	(3.60)	(0.82)
Stdev	1.30	1.22	1.49	1.94	2.37
Sharpe	0.81	0.72	0.85	0.42	0.10
Alpha	1.12	0.99	1.33	0.83	0.28
(t-stat)	(7.40)	(7.00)	(7.70)	(3.70)	(1.03)

Table 5 – Continued

	Panel B:	Individual Stock Portfolios - Earnings to Price			
	Growth Stocks		Value Stocks		Spread between
	1st Q	2nd Q	3rd Q	4th Q	1st and 4th quartiles
A - Smallest					
Mean	5.16	4.18	3.68	6.23	-1.07
(t-stat)	(4.40)	(5.60)	(2.80)	(2.40)	(-0.35)
Stdev	5.26	3.41	5.84	11.79	14.05
Sharpe	0.98	1.22	0.63	0.53	(0.08)
Alpha	5.25	4.51	3.78	6.21	-0.96
(t-stat)	(4.50)	(6.00)	(2.90)	(2.40)	(-0.31)
B					
Mean	3.32	2.67	1.63	2.02	1.31
(t-stat)	(2.70)	(4.10)	(3.30)	(3.50)	(0.89)
Stdev	6.12	3.18	2.45	2.81	7.37
Sharpe	0.54	0.84	0.66	0.72	0.18
Alpha	3.48	2.78	1.68	2.26	1.22
(t-stat)	(2.80)	(4.30)	(3.40)	(4.00)	(0.82)
C					
Mean	1.66	1.44	1.88	2.22	-0.56
(t-stat)	(2.60)	(2.30)	(3.60)	(3.70)	(-0.62)
Stdev	3.03	3.00	2.54	2.89	4.36
Sharpe	0.55	0.48	0.74	0.77	-0.13
Alpha	1.89	1.70	2.16	2.49	-0.61
(t-stat)	(3.00)	(2.70)	(4.10)	(4.20)	(-0.68)
D – Biggest					
Mean	1.11	0.79	0.78	1.02	0.09
(t-stat)	(2.30)	(2.60)	(2.40)	(3.00)	(0.13)
Stdev	2.53	1.61	1.70	1.76	3.55
Sharpe	0.44	0.49	0.46	0.58	0.02
Alpha	1.40	1.11	1.12	1.37	0.03
(t-stat)	(2.90)	(3.60)	(3.40)	(4.10)	(0.04)

Table 5 – Continued

	Panel C:	Individual Stock Portfolios - Cash to Price			
	Growth Stocks 1st Q	2nd Q	Value Stocks 3rd Q	4th Q	Spread between 1st and 4th quartiles
A - Smallest					
Mean	5.27	3.42	2.55	4.71	0.56
(t-stat)	(4.10)	(4.70)	(3.70)	(6.70)	(0.41)
Stdev	6.28	3.51	3.35	3.42	6.71
Sharpe	0.84	0.97	0.76	1.37	0.08
Alpha	5.39	3.47	2.57	4.80	0.60
(t-stat)	(4.20)	(4.80)	(3.70)	(6.80)	(0.43)
B					
Mean	4.35	3.68	2.69	2.28	2.07
(t-stat)	(3.60)	(3.70)	(4.50)	(3.80)	(1.44)
Stdev	6.43	5.34	3.16	3.22	7.78
Sharpe	0.68	0.69	0.85	0.71	0.27
Alpha	4.50	3.80	2.79	2.37	2.13
(t-stat)	(3.70)	(3.80)	(4.70)	(3.90)	(1.48)
C					
Mean	0.74	0.91	1.70	2.37	-1.64
(t-stat)	(1.60)	(2.00)	(3.30)	(5.50)	(-2.68)
Stdev	2.35	2.40	2.67	2.24	3.24
Sharpe	0.31	0.38	0.64	1.06	-0.51
Alpha	0.94	1.12	2.03	2.64	-1.71
(t-stat)	(2.10)	(2.40)	(4.00)	(6.20)	(-2.79)
D - Biggest					
Mean	0.84	0.90	1.13	1.70	-0.86
(t-stat)	(3.30)	(2.70)	(4.00)	(4.90)	(-1.81)
Stdev	1.50	1.91	1.66	2.04	2.80
Sharpe	0.56	0.47	0.68	0.83	-0.31
Alpha	1.13	1.19	1.43	2.01	-0.89
(t-stat)	(4.40)	(3.60)	(5.00)	(5.80)	(-1.87)

Table 5 – Continued

	Panel D:	Individual Stock Portfolios - Dividend to Price			
	Growth Stocks 1st Q	2nd Q	Value Stocks 3rd Q	4th Q	Spread between 1st and 4th quartiles
A - Smallest					
Mean	10.44	8.57	5.26	3.07	7.37
(t-stat)	(5.40)	(5.40)	(3.40)	(4.40)	(4.44)
Stdev	12.45	10.32	10.07	4.57	10.88
Sharpe	0.84	0.83	0.52	0.67	0.68
Alpha	10.53	8.90	5.37	3.06	7.48
(t-stat)	(5.50)	(5.60)	(3.40)	(4.30)	(4.50)
B					
Mean	4.16	3.09	3.18	1.20	2.95
(t-stat)	(5.90)	(3.90)	(3.90)	(5.10)	(4.31)
Stdev	4.70	5.23	5.44	1.56	4.59
Sharpe	0.88	0.59	0.59	0.77	0.64
Alpha	4.31	3.20	3.23	1.45	2.86
(t-stat)	(6.10)	(4.10)	(3.90)	(6.20)	(4.18)
C					
Mean	2.94	2.54	1.41	1.38	1.56
(t-stat)	(3.30)	(3.90)	(3.70)	(4.70)	(1.67)
Stdev	5.88	4.26	2.49	1.96	6.24
Sharpe	0.50	0.60	0.57	0.70	0.25
Alpha	3.16	2.80	1.69	1.65	1.51
(t-stat)	(3.60)	(4.40)	(4.50)	(5.60)	(1.62)
D – Biggest					
Mean	1.80	1.09	0.81	0.66	1.14
(t-stat)	(4.30)	(3.00)	(2.90)	(3.30)	(2.48)
Stdev	2.78	2.38	1.82	1.31	3.09
Sharpe	0.65	0.46	0.44	0.50	0.37
Alpha	2.09	1.40	1.14	1.01	1.08
(t-stat)	(5.00)	(3.90)	(4.20)	(5.10)	(2.36)

Table 6

Performance of Value and Growth Stocks by Market Capitalisation during Global Financial Crisis – Taiwan

Reported are the annualised mean return, t-statistics of the mean, standard deviation and the Sharpe ratio for the growth and value stocks of the Taiwan stock market by market capitalisation respectively for the Global Financial Crisis. Also reported are the alphas and their t-statistics. Each stock market is divided into four main sub-categories, ascending from the smallest to the biggest, based on the equal weighted market capitalisation. Panels A, B, C and D present the results based on four valuation ratios – book-to-market, earnings-to-price, cash-to-price and dividend-to-price respectively.

	Panel A:	Individual Stock Portfolios - Book to Market			
	Growth Stocks		Value Stocks		Spread between
	1st Q	2nd Q	3rd Q	4th Q	1st and 4th quartiles
A - Smallest					
Mean	3.08	3.35	3.45	4.50	-1.42
(t-stat)	(3.90)	(7.10)	(5.70)	(7.20)	(-1.57)
Stdev	6.11	3.67	4.68	4.88	7.07
Sharpe	0.50	0.91	0.74	0.92	-0.20
Alpha	2.83	2.92	3.11	2.19	0.64
(t-stat)	(3.60)	(6.20)	(5.10)	(3.50)	(0.70)
B					
Mean	2.02	2.27	2.52	2.97	-0.95
(t-stat)	(5.30)	(6.10)	(8.20)	(10.10)	(-1.81)
Stdev	2.98	2.88	2.38	2.28	4.10
Sharpe	0.68	0.79	1.06	1.30	-0.23
Alpha	1.44	1.77	2.06	2.50	-1.06
(t-stat)	(3.70)	(4.80)	(6.70)	(8.50)	(-2.02)
C					
Mean	1.18	1.57	2.02	2.47	-1.29
(t-stat)	(4.80)	(6.70)	(9.50)	(11.10)	(-3.83)
Stdev	1.92	1.81	1.66	1.73	2.62
Sharpe	0.62	0.87	1.22	1.42	-0.49
Alpha	0.68	1.00	1.50	1.92	-1.23
(t-stat)	(2.70)	(4.30)	(7.00)	(8.60)	(-3.67)
D – Biggest					
Mean	1.69	2.37	1.87	1.64	0.05
(t-stat)	(8.10)	(3.10)	(9.30)	(8.60)	(0.16)
Stdev	1.63	5.95	1.56	1.48	2.30
Sharpe	1.04	0.40	1.20	1.11	0.02
Alpha	1.14	1.96	1.38	1.11	0.03
(t-stat)	(5.40)	(2.50)	(6.90)	(5.80)	(0.12)

Table 6 - Continued

Panel B: Individual Stock Portfolios - Earnings to Price

	Growth Stocks 1st Q	2nd Q	Value Stocks 3rd Q	4th Q	Spread between 1st and 4th quartiles
A - Smallest					
Mean	10.42	10.94	10.95	13.60	-3.18
(t-stat)	(4.10)	(5.00)	(4.10)	(5.80)	(-0.92)
Stdev	16.04	13.78	17.00	14.89	22.20
Sharpe	0.65	0.79	0.81	0.91	-0.14
Alpha	6.97	10.54	10.60	13.28	-6.30
(t-stat)	(2.70)	(4.80)	(3.90)	(5.70)	(-1.82)
B					
Mean	2.95	2.13	1.76	1.23	1.72
(t-stat)	(7.80)	(6.90)	(8.10)	(7.40)	(4.08)
Stdev	2.61	2.13	1.51	1.14	2.93
Sharpe	1.13	1.00	1.17	1.08	0.59
Alpha	2.47	1.60	1.32	0.76	1.72
(t-stat)	(6.50)	(5.10)	(6.00)	(4.60)	(4.06)
C					
Mean	2.55	1.77	1.67	1.39	1.17
(t-stat)	(9.40)	(7.80)	(6.30)	(8.10)	(3.29)
Stdev	1.95	1.62	1.91	1.22	2.55
Sharpe	1.31	1.09	0.88	1.13	0.46
Alpha	2.00	1.28	1.15	0.88	1.12
(t-stat)	(7.30)	(5.60)	(4.30)	(5.10)	(3.15)
D – Biggest					
Mean	2.06	1.63	1.83	1.40	0.66
(t-stat)	(8.00)	(9.10)	(9.60)	(6.80)	(2.07)
Stdev	1.91	1.33	1.42	1.53	2.38
Sharpe	1.08	1.22	1.29	0.91	0.28
Alpha	1.50	1.13	1.34	1.01	0.49
(t-stat)	(5.90)	(6.30)	(7.00)	(4.90)	(1.54)

Table 6 - Continued

	Panel C:	Individual Stock Portfolios - Cash to Price			
	Growth Stocks 1st Q	2nd Q	Value Stocks 3rd Q	4th Q	Spread between 1st and 4th quartiles
A - Smallest					
Mean	2.43	3.34	4.29	3.84	-1.42
(t-stat)	(3.50)	(4.00)	(5.20)	(7.90)	(-1.69)
Stdev	4.56	5.51	5.45	3.22	5.61
Sharpe	0.53	0.61	0.79	1.19	-0.25
Alpha	-0.64	2.97	4.03	3.50	-4.14
(t-stat)	(-0.90)	(3.60)	(4.90)	(7.20)	(-4.95)
B					
Mean	1.82	1.48	2.15	2.84	-1.02
(t-stat)	(5.70)	(6.70)	(7.70)	(9.90)	(-2.40)
Stdev	2.25	1.54	1.97	2.02	3.01
Sharpe	0.81	0.96	1.09	1.41	-0.34
Alpha	1.30	1.00	1.70	2.37	-1.07
(t-stat)	(4.00)	(4.50)	(6.00)	(8.30)	(-2.52)
C					
Mean	2.02	1.59	1.94	2.00	0.19
(t-stat)	(6.70)	(5.70)	(8.10)	(9.50)	(-0.52)
Stdev	2.20	2.05	1.75	1.54	2.62
Sharpe	0.92	0.78	1.11	1.30	0.07
Alpha	1.42	1.11	1.44	1.70	-0.27
(t-stat)	(5.20)	(3.90)	(6.00)	(8.10)	(-0.77)
D - Biggest					
Mean	1.72	1.71	1.54	1.75	-0.03
(t-stat)	(6.90)	(8.80)	(7.60)	(9.40)	(-0.10)
Stdev	1.86	1.47	1.52	1.39	2.34
Sharpe	0.92	1.17	1.01	1.25	-0.01
Alpha	1.15	1.19	1.19	1.23	-0.08
(t-stat)	(4.60)	(6.10)	(5.80)	(6.60)	(-0.26)

Table 6 - Continued

Panel D:	Individual Stock Portfolios - Dividend to Price				
	Growth Stocks 1st Q	2nd Q	Value Stocks 3rd Q	4th Q	Spread between 1st and 4th quartiles
A - Smallest					
Mean	5.02	4.00	2.86	2.44	2.59
(t-stat)	(5.90)	(6.70)	(4.70)	(7.50)	(3.22)
Stdev	6.63	4.66	4.66	2.53	6.26
Sharpe	0.76	0.86	0.61	0.96	0.41
Alpha	2.67	3.75	2.52	2.04	0.63
(t-stat)	(3.10)	(6.20)	(4.20)	(6.30)	(0.78)
B					
Mean	3.76	2.74	1.68	1.66	2.10
(t-stat)	(7.90)	(8.00)	(7.60)	(9.70)	(4.05)
Stdev	3.69	2.68	1.71	1.34	4.06
Sharpe	1.02	1.02	0.98	1.24	0.52
Alpha	3.21	2.23	1.20	1.20	2.01
(t-stat)	(6.70)	(6.50)	(5.50)	(7.00)	(3.87)
C					
Mean	2.17	2.14	1.38	1.65	0.52
(t-stat)	(8.30)	(8.80)	(6.60)	(8.50)	(1.75)
Stdev	2.04	1.90	1.62	1.51	2.33
Sharpe	1.06	1.13	0.85	1.09	0.22
Alpha	1.55	1.62	0.88	1.15	0.40
(t-stat)	(5.90)	(6.60)	(4.20)	(5.90)	(1.34)
D – Biggest					
Mean	2.13	2.46	1.74	1.22	0.91
(t-stat)	(8.80)	(3.20)	(10.40)	(6.80)	(3.16)
Stdev	1.87	5.92	1.30	1.38	2.26
Sharpe	1.13	0.42	1.34	0.88	0.40
Alpha	1.50	2.10	1.25	0.72	0.79
(t-stat)	(6.20)	(2.70)	(7.40)	(4.00)	(2.73)

Similarly, that the performance of small market capitalisation stocks is better than the big capitalisation stocks in the Hong Kong stock market. Under the book-to market, earning-to-price and dividend-to-price valuation ratios, small market capitalisation stocks performed better than the big market capitalization stocks. For instance, under the book-to-market valuation ratio, the mean return of the small market capitalisation portfolios (A-smallest) is in the range of 1.67 to 2.42 and big market capitalisation portfolios (D-biggest) is in the range 0.82 to 1.27. Whereas under the earning-to-price valuation ratios, the mean return of the small market capitalisation portfolios (A-smallest) is in the range of 3.68 to 6.23 and big market capitalsation portfolios (D-biggest) is in the range 0.78 to 1.11.

In addition, for big market capitalisation, growth stocks performed better than the value stocks under book-to market, earning-to-price and dividend-to-price valuation ratios. As for the risk measures, unstable Sharpe ratio is observed and to a lesser extent, the standard deviation.

In Taiwan stock market, the small market capitalisation portfolios performed better than the big market capitalisation portfolios under all the four valuaation ratios. For instance, under the book-to-market valuation ratio, the mean return of the small market capitalisation portfolios (A-smallest) is in the range of 3.08 to 4.50 and big market capitalisation portfolios (D-biggest) is in the range 1.64 to 2.37. Whereas under the earning-to-price valuation ratios, the mean return of the small market capitalisation portfolios (A-smallest) is in the range of 10.42 to 13.60 and big market capitalisation portfolios (D-biggest) is in the range 1.40 to 2.06.

For the big market capitalisation, growth stocks performed better than the value stocks for all valuation ratios. Positive mean (raw excess returns) and alpha are observed, with significant t-statistics. On the other hand, for the small market capitalisation, value stocks performed better than the growth stocks for book-to market, earning-to-price and cash-to-price valuation ratios. Unstable standard deviation and Sharpe ratio are nevertheless observed, although at a lesser degree.

4.4.4. Stock Performance by market capitalisation - China, Hong Kong & Taiwan stock markets – Euro Zone Crisis

Table 7, Table 8 and Table 9 report the annualised mean return, t-statistics of the mean, standard deviation and the Sharpe ratio for the growth and value stocks of the China, Hong Kong and Taiwan stock markets by market capitalisation respectively for the Euro Zone Crisis. Also reported are the alphas and their t-statistics. Each stock market is divided into four main sub-categories, ascending from the smallest to the biggest, based on equal weighted market capitalisation. Panels A, B, C and D present the results based on four valuation ratios – book-to-market, earnings-to-price, cash-to-price and dividend-to-price respectively.

Table 7
Performance of Value and Growth Stocks by Market Capitalisation during Euro Zone Crisis – China

Reported are the annualised mean return, t-statistics of the mean, standard deviation and the Sharpe ratio for the growth and value stocks of the China stock market by market capitalisation respectively for the Euro Zone Crisis. Also reported are the alphas and their t-statistics. Each stock market is divided into four main sub-categories, ascending from the smallest to the biggest, based on the equal weighted market capitalisation. Panels A, B, C and D present the results based on four valuation ratios – book-to-market, earnings-to-price, cash-to-price and dividend-to-price respectively.

	Panel A:	Individual Stock Portfolios - Book to Market			
	Growth Stocks		Value Stocks		Spread between
	1st Q	2nd Q	3rd Q	4th Q	1st and 4th quartiles
A - Smallest					
Mean	1.32	0.95	1.29	1.21	0.11
(t-stat)	(2.80)	(3.90)	(2.30)	(2.50)	(0.16)
Stdev	3.82	1.99	4.60	3.92	5.60
Sharpe	0.35	0.48	0.28	0.31	0.02
Alpha	1.35	1.29	1.33	1.49	-0.15
(t-stat)	(3.30)	(4.40)	(3.10)	(5.00)	(-0.29)
B					
Mean	0.71	0.34	0.15	0.54	0.17
(t-stat)	(2.50)	(1.70)	(0.90)	(1.80)	(0.41)
Stdev	2.37	1.64	1.39	2.50	3.52
Sharpe	0.30	0.21	0.11	0.22	0.05
Alpha	1.12	0.95	0.83	1.19	-0.07
(t-stat)	(5.60)	(6.60)	(6.00)	(3.00)	(-0.15)
C					
Mean	0.04	0.21	-0.12	-0.25	0.29
(t-stat)	(0.10)	(0.70)	(-0.50)	(-1.00)	(0.92)
Stdev	1.78	2.49	1.87	2.06	2.71
Sharpe	0.02	0.09	-0.07	-0.12	0.11
Alpha	0.85	0.10	0.70	0.76	0.10
(t-stat)	(4.40)	(0.20)	(3.60)	(2.50)	(0.27)

Table 7 - Continued

D - Biggest					
Mean	-0.23	-0.48	-0.60	-0.67	0.44
(t-stat)	(-1.10)	(-2.90)	(-3.10)	(-3.70)	(1.65)
Stdev	1.70	1.41	1.69	1.59	2.35
Sharpe	-0.14	-0.34	-0.35	-0.42	0.19
Alpha	2.00	0.27	0.17	0.08	1.92
(t-stat)	(1.30)	(1.70)	(0.60)	(0.50)	(1.35)

Panel B: Individual Stock Portfolios - Earnings to Price

	Growth Stocks 1st Q	2nd Q	Value Stocks 3rd Q	4th Q	Spread between 1st and 4th quartiles
A - Smallest					
Mean	0.02	0.25	-0.13	-0.06	0.04
(t-stat)	(0.10)	(1.60)	(-0.90)	(-0.20)	(0.11)
Stdev	1.41	1.05	1.02	1.71	2.27
Sharpe	0.02	0.23	-0.13	-0.03	0.02
Alpha	1.61	1.74	1.68	1.78	-0.17
(t-stat)	(8.00)	(16.90)	(14.50)	(6.90)	(-0.52)
B					
Mean	0.20	0.56	0.29	-0.36	0.56
(t-stat)	(0.80)	(2.60)	(1.40)	(-2.10)	(1.97)
Stdev	1.79	1.66	1.57	1.36	2.25
Sharpe	0.11	0.34	0.19	-0.26	0.25
Alpha	2.13	2.13	2.02	1.49	0.64
(t-stat)	(9.90)	(12.10)	(13.80)	(11.30)	(2.49)
C					
Mean	0.78	0.45	0.13	-0.42	1.20
(t-stat)	(2.90)	(1.90)	(0.60)	(-1.80)	(3.43)
Stdev	2.13	1.85	1.59	1.81	2.79
Sharpe	0.37	0.25	0.08	-0.23	0.43
Alpha	2.30	2.11	1.75	1.38	0.92
(t-stat)	(11.60)	(9.50)	(9.60)	(10.10)	(3.76)
D – Biggest					
Mean	1.30	0.11	-0.27	0.03	1.27
(t-stat)	(1.80)	(0.40)	(-1.60)	(0.10)	(1.66)
Stdev	5.79	1.93	1.37	2.60	6.26
Sharpe	0.22	0.06	-0.20	0.01	0.20
Alpha	3.05	3.48	1.25	1.69	1.36
(t-stat)	(4.40)	(2.00)	(8.30)	(3.80)	(1.69)

Table 7 - Continued

	Panel C:	Individual Stock Portfolios - Cash to Price			
	Growth Stocks		Value Stocks		Spread between
	1st Q	2nd Q	3rd Q	4th Q	1st and 4th quartiles
A - Smallest					
Mean	1.49	0.80	0.39	1.38	0.11
(t-stat)	(2.10)	(3.70)	(2.70)	(4.80)	(0.16)
Stdev	5.49	1.71	1.14	2.28	5.55
Sharpe	0.27	0.47	0.34	0.60	0.02
Alpha	2.31	2.15	1.87	2.99	-0.68
(t-stat)	(4.40)	(9.80)	(10.70)	(8.60)	(-1.20)
B					
Mean	0.24	0.55	0.43	0.40	(0.16)
(t-stat)	(1.10)	(2.60)	(2.70)	(2.10)	(-0.55)
Stdev	1.72	1.78	1.31	1.56	2.42
Sharpe	0.14	0.31	0.33	0.26	-0.07
Alpha	1.83	2.23	1.93	2.12	-0.29
(t-stat)	(11.20)	(11.90)	(13.20)	(12.40)	(-1.12)
C					
Mean	-0.35	-0.30	0.55	0.04	-0.39
(t-stat)	(-1.80)	(-1.70)	(2.00)	(0.10)	(-1.03)
Stdev	1.63	1.50	2.26	2.58	3.23
Sharpe	-0.21	-0.20	0.24	-0.12	-0.12
Alpha	1.67	1.60	2.23	2.23	-0.56
(t-stat)	(9.20)	(12.80)	(7.70)	(5.90)	(-1.27)
D - Biggest					
Mean	-0.63	-0.55	-0.50	-0.23	-0.40
(t-stat)	(-3.20)	(-3.40)	(-2.40)	(-1.20)	(-1.37)
Stdev	1.70	1.38	1.80	1.58	2.54
Sharpe	-0.37	-0.40	-0.28	-0.15	-0.16
Alpha	2.73	1.36	1.47	1.42	1.31
(t-stat)	(1.70)	(11.40)	(6.00)	(8.90)	(0.84)

Table 7 - Continued

Panel D:	Individual Stock Portfolios - Dividend to Price				
	Growth Stocks 1st Q	2nd Q	3rd Q	Value Stocks 4th Q	Spread between 1st and 4th quartiles
A – Smallest					
Mean	0.31	-0.08	0.22	0.22	0.09
(t-stat)	(0.80)	(-0.40)	(1.10)	(1.30)	(0.21)
Stdev	3.27	1.42	1.62	1.40	3.63
Sharpe	0.10	-0.06	0.14	0.16	0.02
Alpha	-1.18	-1.23	-1.00	-0.84	-0.33
(t-stat)	(-4.80)	(-9.40)	(-6.60)	(-5.60)	(-1.16)
B					
Mean	-0.08	0.33	0.11	0.87	-0.17
(t-stat)	(-0.50)	(1.80)	(0.40)	(4.90)	(-0.66)
Stdev	1.32	1.59	1.95	1.53	2.23
Sharpe	-0.06	0.21	0.06	0.57	-0.08
Alpha	1.72	1.92	1.97	1.86	-0.15
(t-stat)	(13.60)	(11.00)	(11.30)	(14.10)	(-0.74)
C					
Mean	0.51	0.76	0.15	-0.13	0.64
(t-stat)	(1.80)	(2.60)	(0.80)	(-0.50)	(1.87)
Stdev	2.42	2.50	1.53	1.94	3.00
Sharpe	0.21	0.30	0.10	-0.07	0.21
Alpha	1.93	2.42	1.91	1.64	0.30
(t-stat)	(10.00)	(7.70)	(13.30)	(9.60)	(1.13)
D – Biggest					
Mean	1.55	0.59	-0.06	-0.37	1.92
(t-stat)	(2.20)	(1.70)	(-0.30)	(-1.40)	(2.58)
Stdev	5.96	3.04	1.53	2.19	6.52
Sharpe	0.26	0.19	-0.04	-0.17	0.29
Alpha	3.18	2.59	2.88	1.37	1.80
(t-stat)	(5.40)	(5.70)	(1.90)	(4.30)	(2.77)

Table 8
Performance of Value and Growth Stocks by Market Capitalisation during Euro Zone Crisis – Hong Kong

Reported are the annualised mean return, t-statistics of the mean, standard deviation and the Sharpe ratio for the growth and value stocks of the Hong Kong stock market by market capitalisation respectively for the Euro Zone Crisis. Also reported are the alphas and their t-statistics. Each stock market is divided into four main sub-categories, ascending from the smallest to the biggest, based on the euqal weighted market capitalisation. Panels A, B, C and D present the results based on four valuation ratios – book-to-market, earnings-to-price, cash-to-price and dividend-to-price respectively.

	Panel A:	Individual Stock Portfolios - Book to Market			
	Growth Stocks		Value Stocks		Spread between
	1stQ	2nd Q	3rd Q	4th Q	1st and 4th quartiles
A - Smallest					
Mean	6.28	-0.12	-0.17	-0.91	7.20
(t-stat)	(3.50)	(-2.70)	(-36.30)	(-10.80)	(4.03)
Stdev	10.95	0.27	0.03	0.52	11.00
Sharpe	0.57	-0.45	-5.91	-1.75	0.65
Alpha	5.94	0.12	-0.11	-0.85	6.79
(t-stat)	(3.30)	(2.70)	(-21.70)	(-10.00)	(3.81)
B					
Mean	3.67	1.03	2.16	1.57	2.10
(t-stat)	(4.00)	(1.50)	(2.00)	(1.90)	(1.80)
Stdev	5.66	4.14	6.64	5.20	7.38
Sharpe	0.65	0.25	0.33	0.30	0.28
Alpha	3.75	1.13	2.13	1.61	2.14
(t-stat)	(4.10)	(1.70)	(2.00)	(1.90)	(1.84)
C					
Mean	0.84	1.22	0.42	0.35	0.49
(t-stat)	(1.00)	(2.50)	(0.80)	(1.20)	(0.55)
Stdev	5.05	3.03	3.13	1.73	5.71
Sharpe	0.17	0.40	0.13	0.20	0.09
Alpha	0.74	1.22	0.57	0.27	0.46
(t-stat)	(0.90)	(2.50)	(1.10)	(1.00)	(0.52)

Table 8 - Continued

D - Biggest					
Mean	-0.47	-0.17	0.00	-0.30	-0.17
(t-stat)	(-1.30)	(-0.40)	(0.00)	(-1.30)	(-0.41)
Stdev	2.36	2.53	1.94	1.44	2.69
Sharpe	-0.20	-0.07	0.00	-0.21	-0.06
Alpha	-0.44	-0.17	0.02	-0.26	-0.18
(t-stat)	(-1.20)	(-0.40)	(0.00)	(-1.10)	(-0.44)

Panel B: Individual Stock Portfolios - Earnings to Price

	Growth Stocks 1st Q	2nd Q	Value Stocks 3rd Q	4th Q	Spread between 1st and 4th quartiles
A – Smallest					
Mean	3.18	1.58	2.04	1.25	1.93
(t-stat)	(2.50)	(3.60)	(3.70)	(2.50)	(1.48)
Stdev	5.78	2.01	2.54	2.27	6.10
Sharpe	0.55	0.79	0.80	0.55	0.32
Alpha	3.18	2.00	2.13	1.10	2.08
(t-stat)	(2.50)	(4.60)	(3.90)	(2.20)	(1.60)
B					
Mean	1.63	0.40	1.16	0.83	0.79
(t-stat)	(2.10)	(0.90)	(2.20)	(1.90)	(0.78)
Stdev	3.60	2.07	2.43	2.00	4.85
Sharpe	0.45	0.19	0.48	0.42	0.16
Alpha	1.66	0.43	1.17	0.80	0.86
(t-stat)	(2.20)	(0.90)	(2.30)	(1.90)	(0.85)
C					
Mean	0.52	0.50	0.12	0.08	0.44
(t-stat)	(0.80)	(1.10)	(0.20)	(0.10)	(0.63)
Stdev	3.38	2.22	2.62	2.45	3.67
Sharpe	0.15	0.23	0.05	0.03	0.12
Alpha	0.70	0.53	0.11	0.04	0.66
(t-stat)	(1.00)	(1.20)	(0.20)	(0.00)	(0.93)
D – Biggest					
Mean	0.11	-0.25	-0.48	-0.06	0.18
(t-stat)	(0.30)	(-0.70)	(-1.40)	(-0.20)	(0.41)
Stdev	1.96	2.02	1.89	1.59	2.49
Sharpe	0.06	-0.12	-0.25	-0.04	0.07
Alpha	0.05	-0.25	-0.36	-0.02	0.07
(t-stat)	(0.10)	(-0.70)	(-1.00)	(-0.00)	(0.17)

Table 8 - Continued

	Panel C:	Individual Stock Portfolios - Cash to Price			
	Growth Stocks 1st Q	2nd Q	Value Stocks 3rd Q	4th Q	Spread between 1st and 4th quartiles
A - Smallest					
Mean	1.01	1.01	1.53	3.91	-2.91
(t-stat)	(2.30)	(2.30)	(2.50)	(4.30)	(-3.07)
Stdev	2.19	2.19	3.05	4.59	4.83
Sharpe	0.46	0.46	0.50	0.85	-0.60
Alpha	1.37	1.03	1.58	3.72	-2.35
(t-stat)	(3.10)	(2.40)	(2.60)	(4.10)	(-2.48)
B					
Mean	2.71	1.07	0.78	2.67	0.03
(t-stat)	(2.00)	(2.80)	(1.90)	(3.70)	(0.02)
Stdev	7.02	1.98	2.21	3.80	7.80
Sharpe	0.39	0.54	0.35	0.70	0.00
Alpha	2.78	1.06	0.80	2.83	-0.05
(t-stat)	(2.10)	(2.80)	(1.90)	(4.00)	(-0.03)
C					
Mean	-0.10	-0.22	0.52	1.76	-1.86
(t-stat)	(-0.10)	(-0.60)	(1.50)	(3.30)	(-2.14)
Stdev	3.52	1.95	1.85	2.87	4.76
Sharpe	-0.03	-0.11	0.28	0.61	-0.39
Alpha	-0.16	-0.16	0.55	1.87	-2.03
(t-stat)	(-0.20)	(-0.40)	(1.60)	(3.50)	(-2.33)
D - Biggest					
Mean	2.19	1.87	1.02	1.02	1.17
(t-stat)	(3.40)	(4.70)	(3.10)	(2.00)	(1.30)
Stdev	3.74	2.34	1.92	2.92	5.30
Sharpe	0.58	0.80	0.53	0.35	0.22
Alpha	1.76	1.43	0.57	0.59	1.17
(t-stat)	(2.70)	(3.60)	(1.70)	(1.10)	(1.31)

Table 8 - Continued

	Panel D:	Individual Stock Portfolios - Dividend to Price			
	Growth Stocks		Value Stocks		Spread between
	1st Q	2nd Q	3rd Q	4th Q	1st and 4th quartiles
A - Smallest					
Mean	6.36	3.52	3.49	1.83	4.53
(t-stat)	(4.60)	(3.30)	(2.60)	(6.10)	(3.32)
Stdev	8.83	6.77	8.43	1.93	8.84
Sharpe	0.72	0.52	0.41	0.95	0.51
Alpha	6.51	3.46	3.50	1.76	4.75
(t-stat)	(4.70)	(3.30)	(2.60)	(5.90)	(3.48)
B					
Mean	3.33	3.08	3.50	0.71	2.62
(t-stat)	(2.80)	(3.10)	(1.50)	(1.90)	(2.24)
Stdev	7.83	6.57	14.90	2.47	7.76
Sharpe	0.42	0.47	0.24	0.29	0.34
Alpha	3.45	3.12	3.55	0.71	2.74
(t-stat)	(2.90)	(3.10)	(1.50)	(1.90)	(2.34)
C					
Mean	4.15	-0.06	0.71	0.51	3.64
(t-stat)	(1.60)	(-0.10)	(1.70)	(1.60)	(1.40)
Stdev	16.59	3.58	2.72	2.05	17.05
Sharpe	0.25	-0.02	0.26	0.25	0.21
Alpha	3.99	-0.07	0.81	0.53	3.45
(t-stat)	(1.50)	(-0.10)	(1.90)	(1.70)	(1.33)
D - Biggest					
Mean	-0.94	0.01	-0.54	0.63	-1.58
(t-stat)	(-2.50)	(0.00)	(-1.70)	(2.40)	(-3.36)
Stdev	2.42	1.89	2.01	1.72	3.12
Sharpe	-0.39	0.00	-0.27	0.37	-0.51
Alpha	-0.94	0.09	-0.56	0.66	-1.60
(t-stat)	(-2.50)	(0.30)	(-1.80)	(2.50)	(-3.41)

Table 9
Performance of Value and Growth Stocks by Market Capitalisation during Euro Zone Crisis – Taiwan

Reported are the annualised mean return, t-statistics of the mean, standard deviation and the Sharpe ratio for the growth and value stocks of the Taiwan stock market by market capitalisation respectively for the Euro Zone Crisis. Also reported are the alphas and their t-statistics. Each stock market is divided into four main sub-categories, ascending from the smallest to the biggest, based on the equal weighted market capitalisation. Panels A, B, C and D present the results based on four valuation ratios – book-to-market, earnings-to-price, cash-to-price and dividend-to-price respectively.

Panel A: Individual Stock Portfolios - Book to Market

	Growth Stocks 1st Q	2nd Q	Value Stocks 3rd Q	4th Q	Spread between 1st and 4th quartiles
A - Smallest					
Mean	2.32	1.22	1.86	1.90	0.42
(t-stat)	(3.20)	(3.00)	(5.60)	(6.70)	(0.56)
Stdev	5.65	3.10	2.59	2.21	5.86
Sharpe	0.41	0.39	0.72	0.86	0.07
Alpha	2.34	1.41	2.06	2.08	0.26
(t-stat)	(3.20)	(3.50)	(6.20)	(7.30)	(0.35)
B					
Mean	-0.22	0.36	0.32	0.76	-0.98
(t-stat)	(-0.70)	(1.20)	(1.10)	(3.30)	(-2.77)
Stdev	2.26	2.21	2.20	1.80	2.79
Sharpe	-0.10	0.16	0.15	0.42	-0.35
Alpha	0.03	0.59	0.53	0.94	-0.91
(t-stat)	(0.10)	(2.00)	(1.90)	(4.10)	(-2.57)
C					
Mean	0.02	0.28	0.13	0.62	-0.60
(t-stat)	(0.00)	(1.30)	(0.60)	(2.90)	(-1.06)
Stdev	3.87	1.60	1.57	1.65	4.44
Sharpe	0.01	0.18	0.08	0.38	-0.14
Alpha	0.32	0.49	0.35	0.81	-0.49
(t-stat)	(0.60)	(2.40)	(1.70)	(7.80)	(-0.87)
D - Biggest					
Mean	0.06	-0.01	0.39	0.54	-0.48
(t-stat)	(0.20)	(-0.00)	(1.40)	(3.50)	(-1.58)
Stdev	2.03	1.57	2.03	1.17	2.37
Sharpe	0.03	-0.01	0.19	0.46	-0.20
Alpha	0.34	0.23	0.65	0.78	-0.44
(t-stat)	(1.30)	(1.10)	(2.40)	(5.20)	(-1.46)

Table 9 - Continued

Panel B: Individual Stock Portfolios - Earnings to Price

	Growth Stocks 1st Q	2nd Q	Value Stocks 3rd Q	4th Q	Spread between 1st and 4th quartiles
A – Smallest					
Mean	0.95	2.05	0.86	1.53	-0.58
(t-stat)	(2.60)	(2.30)	(2.90)	(4.50)	(-1.07)
Stdev	2.29	5.51	1.85	2.15	3.46
Sharpe	0.42	0.37	0.46	0.71	-0.17
Alpha	0.97	2.24	1.05	1.71	-0.74
(t-stat)	(2.70)	(2.60)	(3.60)	(5.10)	(-1.37)
B					
Mean	0.88	0.33	0.42	0.12	0.76
(t-stat)	(2.40)	(1.00)	(1.40)	(0.40)	(1.80)
Stdev	2.53	2.29	2.01	1.76	2.93
Sharpe	0.35	0.15	0.21	0.07	0.26
Alpha	1.13	0.56	0.63	0.30	0.83
(t-stat)	(3.00)	(1.60)	(2.10)	(1.10)	(1.97)
C					
Mean	0.17	0.00	0.10	0.15	0.02
(t-stat)	(0.60)	(-0.00)	(0.40)	(0.60)	(0.06)
Stdev	2.00	1.47	1.66	1.67	2.76
Sharpe	0.09	0.00	0.06	0.09	0.01
Alpha	0.47	0.21	0.33	0.35	0.13
(t-stat)	(1.60)	(0.90)	(1.40)	(1.40)	(0.33)
D - Biggest					
Mean	-0.11	-0.11	-0.10	-0.11	0.00
(t-stat)	(-58.90)	(-52.90)	(-45.50)	(-41.60)	(-0.16)
Stdev	0.01	0.02	0.02	0.02	0.03
Sharpe	-7.86	-7.02	-6.01	-5.53	-0.02
Alpha	0.18	0.14	0.16	0.14	0.04
(t-stat)	(102.60)	(7.50)	(67.50)	(56.70)	(11.02)

Table 9 - Continued

	Panel C:	Individual Stock Portfolios - Cash to Price			
	Growth Stocks 1st Q	2nd Q	Value Stocks 3rd Q	4th Q	Spread between 1st and 4th quartiles
A - Smallest					
Mean	1.25	1.11	2.02	3.04	-1.79
(t-stat)	(2.50)	(3.80)	(2.40)	(4.00)	(-1.99)
Stdev	3.36	1.97	5.69	5.09	6.18
Sharpe	0.37	0.56	0.36	0.60	-0.29
Alpha	1.27	1.30	2.22	3.22	-1.95
(t-stat)	(2.60)	(4.50)	(2.60)	(4.30)	(-2.16)
B					
Mean	-0.26	-0.30	0.43	1.77	-2.02
(t-stat)	(-0.80)	(-1.70)	(1.70)	(5.60)	(-4.59)
Stdev	2.14	1.30	1.83	2.33	3.27
Sharpe	-0.12	-0.23	0.24	0.76	-0.62
Alpha	-0.01	-0.07	0.65	1.95	-1.95
(t-stat)	(-0.00)	(-0.40)	(2.60)	(6.10)	(-4.43)
C					
Mean	-0.34	-0.20	0.59	1.05	-1.39
(t-stat)	(-1.60)	(-0.80)	(2.50)	(4.40)	(-4.27)
Stdev	1.53	1.66	1.75	1.78	2.46
Sharpe	-0.22	-0.12	0.34	0.59	-0.57
Alpha	-0.04	0.01	0.82	1.25	-1.29
(t-stat)	(-0.10)	(0.00)	(3.50)	(5.20)	(-3.94)
D - Biggest					
Mean	-0.40	0.15	0.37	1.01	-1.40
(t-stat)	(-2.10)	(0.50)	(1.80)	(4.70)	(-5.25)
Stdev	1.43	1.99	1.56	1.65	2.07
Sharpe	-0.28	0.07	0.24	0.61	-0.68
Alpha	-0.12	0.39	0.63	1.25	-1.37
(t-stat)	(-0.60)	(1.50)	(3.10)	(5.80)	(-5.11)

Table 9 - Continued

	Panel D:	Individual Stock Portfolios - Dividend to Price			
	Growth Stocks		Value Stocks		Spread between
	1st Q	2nd Q	3rd Q	4th Q	1st and 4th quartiles
A - Smallest					
Mean	2.93	0.34	0.90	1.15	1.79
(t-stat)	(4.40)	(1.40)	(2.70)	(3.40)	(2.51)
Stdev	5.03	1.81	2.49	2.55	5.46
Sharpe	0.58	0.19	0.36	0.45	0.33
Alpha	3.17	0.51	1.11	1.18	1.99
(t-stat)	(4.80)	(2.10)	(3.40)	(3.50)	(2.62)
B					
Mean	1.75	1.21	1.20	0.38	1.37
(t-stat)	(5.90)	(5.70)	(4.60)	(1.00)	(3.11)
Stdev	2.27	1.64	2.00	2.70	3.40
Sharpe	0.77	0.74	0.60	0.14	0.40
Alpha	1.29	0.80	0.76	0.00	1.29
(t-stat)	(4.40)	(3.70)	(2.90)	(-0.00)	(2.94)
C					
Mean	0.48	0.10	0.58	0.62	-0.14
(t-stat)	(1.00)	(0.40)	(2.00)	(2.00)	(-0.25)
Stdev	3.52	1.96	2.20	2.30	4.35
Sharpe	0.14	0.05	0.26	0.27	-0.03
Alpha	0.77	0.31	0.83	0.80	-0.04
(t-stat)	(1.60)	(1.20)	(2.90)	(2.70)	(-0.07)
D - Biggest					
Mean	0.61	-0.15	0.37	1.12	-0.51
(t-stat)	(2.80)	(-0.60)	(1.60)	(5.30)	(-1.65)
Stdev	1.69	1.65	1.72	1.65	2.43
Sharpe	0.36	-0.09	0.21	0.68	-0.21
Alpha	0.91	0.14	0.59	1.34	-0.43
(t-stat)	(4.20)	(0.60)	(2.60)	(6.30)	(-1.38)

In the China market, small market capitalisation stocks performed better than the big market capitalisation stocks significantly for all valuation ratios, except the earnings-to-price ratio. For instance, under the book-to-market valuation ratio, the mean return of the small market capitalisation portfolios (A-smallest) is in the range of 0.95 to 1.32 and big market capitalsation portfolios (D-biggest) is in the range -0.67 to -0.23. Whereas under the cash-to-price valuation ratios, the mean return of the small market capitalisation portfolios (A-smallest) is in the range of 0.39 to 1.49 and big market capitalsation portfolios (D-biggest) is in the range -0.63 to - 0.23. Unstable Sharpe ratios and standard deviation are still observed.

Similarly, small market capitalisation stocks outperformed the big market capitalization stocks in Hong Kong and Taiwan stock markets under all valuation ratios. In Hong Kong, for instance, under the book-to-market valuation ratio, the mean return of the small market capitalisation portfolios (A-smallest) is in the range of -0.91 to 6.28 and big market capitalisation portfolios (D-biggest) is in the range -0.47 to 0.00. Whereas under the earning-to-price valuation ratios, the mean return of the small market capitalisation portfolios (A-smallest) is in the range of 1.25 to 3.18 and big market capitalsation portfolios (D-biggest) is in the range -0.48 to 0.11. As for Taiwan stock market, under the book-to-market valuation ratio, the mean return of the small market capitalisation portfolios (A-smallest) is in the range of 1.22 to 2.32 and big market capitalisation portfolios (D-biggest) is in the range -0.01 to 0.54. Whereas under the earning-to-price valuation ratios, the mean return of the small market capitalisation portfolios (A-smallest) is in the range of 0.86 to 2.05 and big market capitalisation portfolios (D-biggest) is in the range -0.11 to -0.10

Unstable Sharpe ratio and standard deviation are still observed, although at a lower degree, as compared to the Global Crisis.

4.5 Empirical Discussions

4.5.1. Stock Performance - China, Hong Kong & Taiwan stock markets – Global Financial Crisis & Euro Zone Crisis

The research has two objectives. Firstly, to assess the impact of Global Financial Crisis and Euro Zone Crisis on the performance of value stocks and growth stocks in the China, Hong Kong and Taiwan stock markets, taking into consideration overall firm and market capitalisation issues. Secondly, to examine do the standard risk measures explain the risk and return relationship of these two stock selection strategies, at overall firm and market capitalisation levels, during the Global Financial Crisis and Euro Zone Crisis.

The research on the relationship between stock behavior and crises has been expanding over the years. In the context of 1997 Asia Financial Crisis, K.P. Lim et al. (2008) empirically explore the effects of the 1997 financial crisis on the efficiency of eight Asian stock markets. On the other hand, Tuluca and Zwick (2001) investigate the comovement of daily returns from 13 Asian and non-Asian markets before and after the advent of the Asian crisis in July 1997. As for the Global Financial Crisis. , Calomiris, Love and Pería (2010) have identified the relationship between crisis "shock factors" and the cross-section of global equity returns, whereas Chaudhury (2011) has studied the effect of the Global Financial Crisis on the behavior of stock prices of thirty one major US stocks and the S&P 500. In addition, Rjoub and Azzam (2011) empirically examine stock returns behavior during financial crises for Jordan market from 1992 to 2009. The recent work of Muir (2014) has comprehensively analysed the behavior of risk premia in financial crises, wars, and recessions. It is documented that risk premia increase substantially in financial crises. Despite the growth in the research on the relationship between stock behavior and crises, little or no research has been carried out on the value premium phenomenon over a short term horizon with high volatility for the Greater China stock markets.

In the midst of noise from both the crises, preliminary evidence is that growth stocks outperformed the value stocks during both the Global Financial Crisis and Euro Zone Crisis in China and Hong Kong stock markets. During the Global Financial Crisis, the mean return of the growth stocks (the 1st quartile) of the Hong Kong stock market are 2.30, 5.55 and 7.54 respectively under the book-to-market, cash-to-price and dividend-to-price ratios, higher than the mean return of the value stocks (the 4th quartile) of 1.95, 2.57 and 1.65 respectively under the same valuation ratios. As for the China stock market, the mean return of the growth stocks (the 1st quartile) are 1.77, 1.77 and 2.18 respectively under the book-to-market, earnings-to-price and dividend-to-price ratios, whereas the mean return of the value stocks (the 4th quartile) are 1.62, 0.97 and 1.26 respectively under the same valuation ratios.

Similarly, the mean return of the growth stocks (the 1st quartile) of the Hong Kong stock market are 2.35, 1.09, 3.68 and 3.96 respectively under the book-to-market, earnings-to-price, cash-to-price and dividend-to-price ratios during the Euro Zone Crisis, higher than the mean return of the value stocks (the 4th quartile) of 1.87, 0.65, 1.80 and 1.39 respectively under the same valuation ratios. As for the China stock market, the mean return of the growth stocks (the 1st quartile) are 0.61, 0.49, 0.32 and 0.38 respectively under the book-to-market, earnings-to-price, cash-to-price and dividend-to-price ratios, whereas the mean return of the value stocks (the 4th quartile) are -0.03. -0.20, 0.20 and -0.09 respectively.

The finding is contrary to the earlier investigations which have provided evidences on the value premium phenomenon in the international stock markets (see for example Fama and French, 1988, 1992, 1993; Davis et.al., 2000; Claessens et. al., 1998, David et. al., 2000; Asness et al., 2009) and Asian markets - China, Hong Kong, Taiwan and Singapore over the long run. Shum and Tang (2005), for instance, have found that mean return in the Hong Kong stock market tends to increase from low book-to-market portfolios (growth stocks) to high book-to-market portfolios (value stocks). Similarly, high book-to-market portfolios earn higher returns than low book-to-market portfolios in the Singaporean stock market. However, the mean return in the Taiwan stock market tends to decrease from low book-to-market firms to high book-to-market firms. The analysis of Wang and Di Iorio (2007) on China stock market also suggested that on average, the return on the book-to-market top portfolio exceeds the return on the equally weighted portfolio benchmark and the book-to-market bottom portfolio by 0.493% and 0.861% per month respectively.

The main distinction between this research and the earlier works is that this thesis examines the issue of value premium in the short term high volatility periods. Although the recent work of Lee, Strong and Zhu (2014) has a similar finding that value stocks significantly underperformed growth stocks during the subprime credit crisis in the U.S. market, it is argued that the research is more robust as it has adopted a two period framework.

As for the Taiwan stock market, the behavior of the value and growth stocks is not only substantially different from that of China and Hong Kong stock markets, but it is also inconsistent with the finding of Lee, Strong and Zhu (2014). The research has discovered that in the Taiwan stock market, value stocks outperformed the growth stocks under the book-to-market, cash-to-price and dividend-to-price valuation ratios during the Global Financial Crisis and the Euro Zone Crisis. During the Global Financial Crisis, the mean return of the value stocks (the 4th quartile) of the Taiwan stock market are 3.20, 2.90 and 3.94 respectively under the book-to-market, cash-to-price and dividend- to-price ratios are higher than the mean return of the growth stocks (the 1st quartile) of 1.87, 1.95 and 3.47 respectively under the same valuation ratios. During the Euro Zone Crisis, the mean return of the growth stocks (the 1st quartile) are 0.33, 0.54, 0.01 and 0.97 respectively under the book-to-market, earnings-to-price, cash-to-price and dividend-to-price ratios, whereas the mean return of the value stocks (the 4th quartile) are 0.98, 0.40, 1.46 and 1.24 respectively.

When answering the research objective that do the standard risk measures explain the risk and return relationship of these two stock selection strategies, it is discovered the standard deviation and Sharpe ratio are unstable in the China, Hong Kong and Taiwan stock markets during the Global Financial Crisis. This observation is inconsistent with the main tenet of traditional finance - the greater the risk, the more attractive return. However, lower degree of misbehaving is observed in the standard deviation and Sharpe ratio for the Euro Zone Crisis. The research findings do not confirm with the observation of Lee et. al., (2014) that value stocks are vulnerable to downturns like the crisis is consistent within them being risker than growth stocks. It is argued that the main difference between the two is that this research examines the behaviour of standard deviation and Sharpe ratio in the context of risk and return relationship during two major financial crises. Whilst, the methodology adopted by Lee et al. (2014) focus on the availability of external funding to non-financial firm. Therefore, the view that standard risk measures do not fully explain the risk and return relationship of these two stock selection strategies is arrived at.

In the study on the relative risk of value and growth stocks, Petkova and Zhang (2005) argue that value-minus-growth beta tends to covary positively with the expected market risk premium. Hence, their results cast doubt on the common perception that value cannot be risker than growth. With the empirical results that growth stocks outperformed value stocks the China, Hong Kong and U.S. stocks markets during major financial crises, the observations have provided contradictory evidence to the view of Petkova and Zhang (2005). Hence, the issue of the matter is that what is the main theoretical reasoning behind the phenomenon that growth stocks outperformed value stocks the China, Hong Kong and U.S. stocks markets during major financial crises, when value stocks are riskier? Distress and bankruptcy risk may offer another perspective on the debate. The occurrence of financial crises exposes firms to greater distress and bankruptcy risk. In the context of distress risk, Campbell, Hilscher and Szilagyi (2008) has further argued that instead of distress risk itself, a number of firm characteristics which vary with distress risk may account for the variation in realized return.

4.5.2. Stock Performance by market capitalisation - China, Hong Kong & Taiwan stock markets – Global Financial Crisis and Euro Zone Crisis

In the investigation of the effect which the market capitalization has on the performance of stocks, it is discovered that small stocks outperformed big stocks during the Global Financial Crisis and Euro Zone Crisis for the three stock markets in the Great China region. As compared to previous works, the research shows that to a large extent and with statistics significance, the small size effect did not diminish in the Greater China stock markets during two major financial crises.

The observation is consistent with the small size effect that is well documented in the empirical asset pricing literature for the U.S. and international markets (see for example – Keim, 1983; Daniel and Titman, 1997; Fama and French, 2008). The work of Shum and Tang (2005) has shown that in the Hong Kong stock market, small firms outperform big firms; In the Singaporean stock market, portfolios contain small stocks capture higher returns than portfolios of big stocks; Mean return in the Taiwan stock market tends to decrease from small-size portfolios to large-size portfolios. In addition, the results of Wang and Di Iorio (2007) indicate that size has the most significant effect in capturing variations in stock returns over the whole period of investigation in the Chinese A-share market. Lam (2002) has documented that in the Hong Kong Stock Exchange for the period July 1984–June 1997, three of the variables under investigation - size, book-to-market equity and E/P ratios, seem able to capture the cross-sectional variation in average monthly returns over the period.

Consistent with the results of the value premium investigation for the Greater China stock markets, unstable standard deviation and Share ratio are observed in the three stock markets during the Global Financial Crisis. Comparatively, lower degree of unstablility is observed on the behavior of the two risk measures during Euro Zone Crisis.

Despite there is abundant evidence on the small size effect, it is still unclear whether a robust theoretical explanation exists. One of the main arguments for this phenomenon is the abnormal returns of small stocks in January (Keim, 1983). Daniel and Titman (1997) later reconfirmed the strong relationship between small size phenomenon and January effect. On the other hand, Stoll and Whaley (1983) in their study on the effect of transaction costs on small firm effect, has documented that for the NYSE stocks, the size anomaly disappears when the bid-ask spread is taken into account. Hence, the compensation for illiquidity could be another explanation for small size effect.

Notwithstanding the possible explanations above, some scholars have challenged otherwise – the premium disappears for decades at a time, doesn’t seem to exist outside the U.S. stock markets and can be caused by micro firms which are doing very well in January. The recent work of Asness, Frazzini and Pedersen (2014) has overcame these challenges posed by demonstrating that after controlling for the quality factor, there is a significant size premium, which is stable through time, emerges. The measures of quality factor proposed are profitability, 5-year growth rate in the profit, ‘safety’ and dividend payout ratio. The research believes that the illiquidity factor could be the main reason that the small size effect does not diminish in the Greater China stock markets during two major financial crises.

When comparing the performance of both the small and big stocks between Global Financial Crisis and Euro Zone Crisis, it is found that the returns of small and big stocks during Global Financial Crisis are higher than those of small and big stocks during Euro Zone Crisis. One of the possible theoretical reasons for this phenomenon is the learning curve which is garnered by the investors when some of them are uncertain whether others are trading on informative signals (fundamentals) and noise, (Banerjee and Green 2015). It is argued that this model is particularly relevant in the context the two-period framework of this research. The investors and traders would most likely have learned much about the behavior of others during high volatility period of Global Financial Crisis. As a result, the investors and traders had incorporated the learning experience from the Global Financial Crisis in their decision making, when investing and trading again during the Euro Zone Crisis.

4.6 Chapter Summary and Conclusions

"The great historian of science, Thomas Kuhn, taught us that the key to improving any theory is to surface the anomalies – events or phenomenon that theory cannot explain. It is only by seeking to account the outliers – exception to the theory-that research can improve the theory."

Clayton M. Christensen (2000)

It has been well documented in the finance literature that value premium phenomenon exists in the long run. However, little research has been carried to examine the validity of the value premium phenomenon during financial crisis period. The financial crisis period is characterised by excess volatility (Shiller, 1981) in the short term horizon. Given the occurrence of the Global Financial Crisis and Euro Zone Crisis is rare, it offers an ideal window to examine the relevance and survival of value premium in a two period high volatility framework. It is argued that the use of a two period model is more robust and less vulnerable, as far as the results are concerned. Therefore, by surfacing the anomalies, the aim of this empirical analysis is to provide some preliminary evidence of the outliers, so that the boundary of knowledge and theory could be extended.

The empirical results show that growth stocks outperformed value stocks during both the Global Financial Crisis and Euro Zone Crisis in the China and Hong Kong stock markets, contrary to the theoretical understanding that value premium exists in the long run. This work complements similar finding of Lee, Strong and Zhu (2014) in the U.S. market. However, value stocks outperformed the growth stocks in the Taiwan stock market during the Global Financial Crisis and Euro Zone Crisis.

The small size effect did not really diminish in the Greater China stock markets during two major financial crises. It is discovered that small stocks outperformed big stocks during the Global Financial Crisis and Euro Zone Crisis for the three stock markets in the Greater China region. Furthermore, it is found that the returns of small and big stocks during Global Financial Crisis are higher than those of small and big stocks during Euro Zone Crisis. As compared to previous works, the research shows that to a large extent and with statistics significance, the small size effect did not diminish in the Greater China stock markets during two major financial crises.

In examining do the standard risk measures explain the risk and return relationship of these two stock selection strategies at both the firm and market capitalisation levels, it is discovered that the standard deviation and Sharpe ratio are unstable in the China, Hong Kong and Taiwan stock markets during the Global Financial Crisis. Comparatively, lower degree of unstablility is observed on the behavior of the two risk measures during Euro Zone Crisis. With the preliminary evidence, it is argued that therefore, standard risk measures do not fully explain the risk and return relationship of these two stock selection strategies.

The empirical results and analysis have provided the preliminary evidence and valid ground for the search of truth. With the aim to further improve the theory, the preliminary evidence leads to the research question of "Do the risk factors explain value premium in the Greater China stock markets during two major financial crises?" in empirical analysis 2. The research considers three models from the risk based theory under the value premium literature – Banko, Conover and Jensen (2006), Fama and French Three Factor Model (1992, 1993) and Fama and French Five Factor Model (2014), in the quest of answering this research question.

CHAPTER 5 – EMPIRICAL ANALYSIS 2

Do the risk factors explain value premium in the Greater China stock markets during two major financial crises?

"It's not merely that there is no longer a signal amid the noise, but the noise is being amplified."

Nate Silver

5.1 Introduction

The efficient market hypothesis was developed by Fama (1965, 1970). It is proposed by Fama (1970) that:

"in general term, the ideal is a market which prices provide accurate signal for resource allocation: that is a market in which a firm can make production-investment decisions, and investors can choose among the securities that represent ownership of firm's activities under the assumption the securities prices at any time fully reflect all available information. A market in which prices always fully reflect available information is called efficient".

Khan (2011) elaborates that a market is informationally efficient if prices are, on average correct given the publicly available information. For market to be is informationally efficient, prices react rapidly to new events. On average, the market correctly impounds the new information. In order for a competitive market to achieve price equilibrium, the following conditions have to hold:-

- Structure knowledge. The assumption is investors have complete information about the underlying structure of the return-generating process.
- Rational information processing. The assumption is that on average, investors possess information in a cognitively unbiased manner.
- No limit to arbitrage. The rational investors will quickly step in and arbitrage away the mispricing even if the trades of irrational investors are correlated and result in mispricing.

The efficient market hypothesis has since becomes one of the important pillars in the modern theory of finance. However, Jensen (1978) argues that with the availability of better data and increases in econometric sophistication, evidences which are inconsistent with the theory will no longer be ignored. Along the same line of thought, Ball (1978) points out that taken individually many scattered pieces of evidence which are inconsistent with the theory don't amount to much. Yet viewed as a whole, these pieces of evidence begin to stack up in a manner which make a much stronger case for the necessity to carefully review. It is well recognised that value premium phenomenon is one of such evidences.

The value premium phenomenon is where the superior return generated through the purchase of value stocks relative to growth stocks over the long run. (see for example Lakonishok et al, 1994; Fama and French, 1998; Bauman et al, 2001;Cakici et al, 2011). Value and growth strategies are classified based on sales, the book-to-market (B/M) ratio, price-to-earnings (P/E) ratio, cash-to-price (C/P) ratio, dividend-to-price (D/P) ratio and growth of sales (G/S) (see for example Basu, 1977, 1983; Rosenberg et al, 1985; Fama and French, 1998).In addition, the firm size effect is also revealed (Banz, 1981; Reinganum,1981).While the earlier works were only confined to study of value effects at the firm-level, industry-level study has revealed that the value effect is observed with strongest in value industries and weakest in growth industry. (Banco et al.2004). When a major shift to investigate the sources of predictability of equity returns is observed (Ferson and Hayvey, 1991; Haugen and Baker 1996), Haugen and Baker (1996) present an argument on the "revelation of a major failure in the Efficient Market Hypothesis". Although the value premium phenomenon is well recognised, two major competing arguments emerge - is it risk or behavioral bias?

In the light of the occurrence of the Global Financial Crisis, Ball (2009) views that there are lessons to be learned on the issue of market efficiency. One of the important lessons from the global financial crisis is that the world is more complex than many thought. As a result, it is certainly more complex than many or most pricing models used in practice.

Based on the bounded rationality assumption (Simon, 1990), the preliminary evidence of Empirical Analysis 1 then leads to the research question of "Do the risk factors explain value premium in the Greater China stock markets during two major financial crises" With the aim to further improve the theory, the research considers three models from the risk based theory under the value premium literature – Banko, Conover and Jensen (2006), Fama and French Three Factor Model (1992, 1993) and Fama and French Five Factor Model (2015), in the quest of answering this research question. Based on the research question above, the research objective is

- To examine do and to what extent the risk measures of (i) Banko, Conover and Jensen Model (2006), (ii) Fama and French Three Factor Model (1992, 1993) and (iii) Fama and French Five Factor Model (2015) explain the value premium in the Greater China stock markets during the Global Financial Crisis and Euro Zone Crisis.

5.2 Data Selection and Description of Data

The data for the Greater China stock markets, which comprise of China, Hong Kong and Taiwan stock markets are collected from the Data Stream Database. The data covers monthly firm's stock prices and firm's financial characteristics, such as price-to-book value, price-to-earning value, price-to-cash value, dividend yield, earnings per share, net tangible asset, assets per share, net debts, dividend per share, operating income, interest, and number of shares. All data set are spanning from December 2007 to June 2012.

The stock market indices data are collected from Yahoo Finance spanning from December 2007 to June 2012. CSI 300 Index, which is a capitalization-weighted stock market index designed to replicate the performance of 300 stocks traded in the Shanghai and Shenzhen stock exchanges, is used for China stock markets. Hang Send Index and Taiwan Stock Exchange Weighted Index are used for Hong Kong and Taiwan stock markets respectively. Risk free rates data for China, Hong Kong and Taiwan are collected from CEIC Data for December 2007 to June 2012.

As the Dow Jones Industrial Average fell from the peak of 14,000 in October 2007 to just over 8,000, after a sharp decline of more than 40% in the early October 2008, this signifies the beginning of the global financial crisis. Alongside the Dow, major stock markets in other countries have plunged as well. According to the U.S. National Bureau of Economic Research (NBER), the recession ended in June 2009. In the context of this investigation, data from December 2007 to December 2010 are used for Global Financial Crisis, covers a 36 months period. Whereas data from November 2009 to June 2012 are used for Euro Zone Crisis, cover a 32 months period.

The data set consists of 1,321, 1,128 and 1,409 companies listed on the China, Hong Kong and Taiwan stock markets respectively (the population size). The company data are grouped based on Global Industry Classification Sectors (GICS), such as capital goods, consumer durables and apparel, consumer services, diversified financials, materials, real estate, retailing, software and services as well as technology hardware and equipment. However, some 106, 386 and 405 companies of the China, Hong Kong and Taiwan stock markets are excluded from the analysis due to various reasons such as delisting, incomplete data and listed after the "formation period" for the value and growth stocks classification

5.3 Methodology

The methodological approach adopted in this thesis derived from the theoretical framework described in Chapter 3.

5.3.1 Banko, Conover and Jensen Model (2006)

Using data obtained from Data Stream Database, CEIC Data and Yahoo Finance, five equal-weighted portfolios are formed within each of 18, 14 and 11 different industries for China, Hong Kong and Taiwan stock markets during the Global Financial Crisis and Euro Zone Crisis. The firms within each industry are ranked by BE/ME and formed into portfolios by quintiles. Each of the 20% of the firms are sorted into five portfolios in sequential and ascending order, by using the framework of Fama and French (1992) and Banko et al. (2006). BE/ME is measured at financial year-end in calendar year (t-1) and the market capitalisation (ME) is measured at calendar year-end t-1. Portfolio returns are derived as monthly equal-weighted returns for the firms in the portfolio. Firms with negative book value are dropped, following Fama and French (1992). Each industry is required to maintain a sample of at least thirty firms throughout the period under consideration in order to establish robust statistics. Portfolios are reformed on an annual basis.

The identification and classification firms into industry are done by using the Global Industry Classification Standard (GICS), as it is the most commonly used by portfolio and asset managers. Scislaw (2015) argues that an important reason to use GICS rather than other classification system is that researcher should use definitions and methods commonly employed by investor. This view is consistent with the finding that GICS is a superior industry classification system (Bhojraj et al., 2003).

By running regression analysis on monthly cross section time series data (panel data), coefficient is estimated from

$$R_{pt} = \alpha_0 + \beta_1 BE/ME_{pt} + \beta_2 IndBE/ME_{pt} + \beta_3 ME_{pt} + \beta_4 Beta_p + \varepsilon_{pt} \qquad (1)$$

where

R_{pt} = Equally weighted return on BE/ME portfolio p calculated from Jan of year t through Dec of year t,

BE/ME_{pt} = natural log of book-to-market for portfolio p

$Ind\ BE/ME_{pt}$ = natural log of book-to-market for the industry that includes portfolio p.

ME_{pt} = natural log of the market capitalization of portfolio p at Dec – of end of year t-1.

$Beta_p$ = full period beta for portfolio p calculated relative to the indices of the China, Hong Kong and Taiwan Stock Exchanges.

In the regression analysis, this research uses ordinary least squares approach of a cross sectional, time-series setting. Petersen (2009) argues that in the data seta of the panel data, the residuals may be correlated across firms or across time. Therefore, the OLS standard errors can be biased. The author examined the different methods used in the literature and explained when the different methods yield the same and correct standard errors and when they diverge. He has proposed techniques for estimating standard errors in the presence of a fixed firm effect (CL-F), a time effect (CL-T) as well as a fixed firm and time effect (CL – F&T).

The research uses highly volatile monthly data relevant to two major financial crises periods. Banko, Conover and Jensen Model (2006) use the generalized least squares approach of Parks (1967) in a pooled cross-sectional, time-series setting to control for time-series and cross-sectional correlations and heteroskedasticity in the model residuals. Similar to the procedure of Banko, Conover and Jensen Model (2006), the regressions are estimated with portfolio data that are formed based on BE/ME ranks.

By adopting the methodology of Banko et al. (2006), the formation of portfolio is designed to isolate the returns specifically associated with BE/ME. This procedure is used to control for market capitalization and beta which may have been shown to have a significant relationship with returns, thereby avoiding the identification of a spurious relationship. The market capitalisation (ME) and beta are calculated by using Fama and French procedure (1992).ME is calculated as price per share times number of shares outstanding at the Dec-end of June in year t-1.

5.3.2 Fama and French Three Factor Model (1992, 1993)

Given the empirical nature of this study and the absence of theory in guiding the factor constructions, this research has closely followed the empirical design of prior studies to enhance comparability. Construction of the book-to-market and equity portfolios closely follows the procedures described by Fama and French (1992 &1993) and Carhart (1997). The portfolios are formed based on three main groupings – overall firm, market capitalisation and stock market integration (Griffin, 2002).

These portfolios are constructed in the following manner. Five equal-weighted portfolios are formed within each of the four main groupings – overall/firm, market capitalization, industry classification, for China, Hong Kong and Taiwan stock markets during the Global Financial Crisis and Euro Zone Crisis. The firms within each classification are ranked by book-to-market and formed into portfolios by quintiles. Each of the 20% of the firms are sorted into five portfolios in sequential and ascending order, by using the framework of Fama and French (1992, 1993). Construction of the book-to-market and equity portfolios closely follows the procedures described by Fama and French (1993)and Carhart (1997). Portfolios are reformed on an annual basis.

The investigation on the risk based explanation followed the three factor model as proposed by Fama and French (1993). The three factor models are the market return in excess of the risk-free rate (Market Risk Premium, MRP = Rm-Rf), the difference between the returns on small and big capitalisation portfolios (SMB, small minus big), and the difference between the returns on high and low book-to-market portfolios (HML, high minus low).

By running regression analysis on monthly cross section time series data (panel data), coefficient is estimated from

$$R_{it} = \alpha_i + \beta_i (Rm_t - Rf_t) + \varpi_i SMB_t + \theta_i HML_t + \varepsilon_{it} \quad (2)$$

The definitions of the variables in the Fama and French (1992, 1993) three factor model are as follows:-

(a) R_{it} Firm stock returns (Rit) in terms of excess return have calculated as follows:-

$$R_{it} = [\{(P_{pt} - P_{i,t-1}) / P_{i,t-1}\} + DY_{it}] - Rf_t$$

Where P_{it} is a closing stocks price at month-end for firm *i* at time t and DY_{it} is the dividend yield firm *i* at year–end at time t and R_f is a risk-free asset proxy by the relevant twelve months Treasury bill rate. DY_{it} , however, is excluded from the calculations of R_{it} , as its magnitude is relatively insignificant as compared to changes in the closing stock prices $(P_{pt} - P_{i,t-1})$.

(b) The market return is proxies by the return of stock market indices of the relevant Stock Exchanges (HSI). The exchange market return is expressed in terms of excess returns as follows:-

$$Rm_t = [\{(HS_t - HS_{t-1}) / HS_{t-1}\}] - Rf_t$$

(c) Small minus big (SMB)

The difference between the return on a portfolio of small market capitalisation stocks and the return on a portfolio of big market capitalization stocks.

(d) High minus low (HML)

The difference between the return on a portfolio of high book-to-market stocks and the return on a portfolio of low book-to-market stocks.

In the regression analysis, this research uses ordinary least squares approach of a cross sectional, time-series setting. Petersen (2009) argues that in the data seta of the panel data, the residuals may be correlated across firms or across time. Therefore, the OLS standard errors can be biased. The author examined the different methods used in the literature and explained when the different methods yield the same and correct standard errors and when they diverge. He has proposed techniques for estimating standard errors in the presence of a fixed firm effect (CL-F), a time effect (CL-T) as well as a fixed firm and time effect (CL – F&T)

The research uses highly volatile monthly data relevant to two major financial crises periods, although ordinary least squares regressions is used by Fama & French (1992, 1993 & 2014) for long period data.

5.3.3. Fama and French Five Factor Model (2015)

These portfolios are constructed as per described in the preceding section. Construction of the book-to-market and equity portfolios closely follows the procedures described by Fama and French (1992, 1993 & 2015)and Carhart (1997). The portfolios are formed based on three main groupings – overall / firm, market capitalization and stock market integration (Griffin, 2002). Portfolios are reformed on an annual basis.

The investigation on the risk based explanation followed the three factor model as proposed by Fama and French (1993). In addition to the three factors - MRP (market risk premium factor), SMB (size factor) and HML (book-to-market factor), the other two new factors in the Fama and French Five Factor Model (2014) are RMW (profitability factor) and CMA (investment factor) respectively.

By running of analysis on monthly cross section time series data (panel data), coefficient is estimated from

$$R_{it} = \alpha_i + \beta_i (Rm_t - Rf_t) + \varpi_i SMB_t + \theta_i HML_t + \kappa_i RMW_t + \lambda_i CMA_t + \varepsilon_{it} \quad (3)$$

The definitions of the new variables in the Fama and French (2014) five factor model are as follows:-

(a) Robust minus weak (RMW)

The difference between the returns on diversified portfolios of stocks with robust and weak profitability.

(b) Conservative minus aggressive (CMA)

The difference between the returns on diversified portfolios of low and high investment firms.

Similar to the discussion above, this research uses ordinary least squares approach of a cross sectional, time-series setting. Petersen (2009) argues that in the data seta of the panel data, the residuals may be correlated across firms or across time. Therefore, the OLS standard errors can be biased. The author examined the different methods used in the literature and explained when the different methods yield the same and correct standard errors and when they diverge. He has proposed techniques for estimating standard errors in the presence of a fixed firm effect (CL-F), a time effect (CL-T) as well as a fixed firm and time effect (CL-F&T).

5.3.4 Griffin (2002) – Market Integration Issue

In an efficient and integrated international capital market, Griffin (2002) argued that a single set of risk factor (P) is sufficient to describe expected returns in all countries.

$$R_{it} = \alpha_i + \beta_i P(Rm_t - Rf_t) + \omega_t PSMB_t + \theta_{tP}\, HML_t + \varepsilon_{it} \quad (4)$$

Further decomposition of the three-factor models – regional factors into domestic (D) and international (F) components is more useful in explaining the variation in the equity stock return. Hence, from this perspective, the risk model should be examined on domestic and international factors where the Greater China stock markets at the firm level are presumably integrated and efficient.

The regional factors (P) are the weighted averages (W) of the components in each of the four stock exchanges. The weighted average computation is based on the market capitalisation, with fraction attributable to the domestic market (D) and the balance attributable to the foreign market (F) capitalization at time t. Therefore,

$$P(Rm_t - Rf_t) = [(WD_t)D(Rm_t - Rf_t) + (WF_t)F(Rm_t - Rf_t)] \quad (5)$$

Similarly, the weighted average for the regional SMB, HML, Profitability (RMW) and Investment (CMA) factors is based on their respective country specific factors.

As both the domestic and foreign factors are having a different impact on stock returns, therefore the international factor model regression is proposed for

(iii) the Fama and French Three Factor Model is

$$R_{it} = \alpha_i + \beta_{Di} W_{Dt} D(Rm_t - Rf_t) + \omega_{Di} W_{Dt} DSMB_t + \theta_{Di} W_{Dt} DHML_t + \beta_{Fi} W_{Ft} F(Rm_t - Rf_t) + \varpi_{Fi} W_{Ft} FSMB_t + \theta_{Fi} W_{Ft} FHML_t + \varepsilon_{it} \tag{6}$$

(iv) the Fama and French Five Factor Model is

$$R_{it} = \alpha_i + \beta_{Di} W_{Dt} D(Rm_t - Rf_t) + \omega_{Di} W_{Dt} DSMB_t + \theta_{Di} W_{Dt} DHML_t + \kappa_{Di} W_{Dt} DRMW_t + \lambda_{Di} W_{Dt} DCMA_t + \beta_{Fi} W_{Ft} F(Rm_t - Rf_t) + \varpi_{Fi} W_{Ft} FSMB_t + \theta_{Fi} W_{Ft} FHML_t + \kappa_{Fi} W_{Ft} FRMW + \lambda_{Fi} W_{Ft} FCMA + \varepsilon_{it} \tag{7}$$

5.4 Empirical Results and Analysis – China, Hong Kong and Taiwan Stock Markets

The risk measures of Banko, Conover and Jensen Model (2006) are BE/ME (book-to-market ratio), Industry BE /ME (Industry book-to-market ratio), ME (market capitalilsation) and Beta. As for the Fama and French Three Factor Model (1992, 1993), the risk measures are MRP (market risk premium factor/ excess market return), SMB (size factor) and HML (book-to-market factor). Whereas, the Fama and French Five Factor Model (2015) comprises of two additional risk measures - RMW (profitability factor) and CMA (investment factor).

When proposing the Efficient Market Hypothesis (EMH), Fama (1970) has argued that 'in general term, the ideal is a market which prices provide accurate signal for resource allocation'. In the context of this research and in the spirit of the EMH, it is suggested that signal can be classified as strong, semi-strong and weak, similar to strong form, semi-strong form and weak form of efficiency, for the risk measures. The proposed signal classification is based on a two-period framework.

It is proposed that the classification of the signal is based on three main criteria – level of significance, coverage and sign of the coefficient – positive or negative.

	Strong Signal	Semi-Strong Signal	Weak Signal
1. Level of Significance 2. Coverage 3. Sign of Coefficients			

The level of significance is considered as follows:-

1. Significant - at 1% t-statistical significance
2. Marginally significant - at 5% t-statistical significance
3. Weakly significant - at 10% t-statistical significance

The coverage may include number of stock markets, market capitalisation issue and number of sample industries**.**

5.4.1. Banko, Conover and Jensen Model (2006)

Table 10 reports the summary statistics for the sample separated by industry grouping and sorted by book-to-market (BE/ME) ratios for the China, Hong Kong and Taiwan stocks markets during Global Financial Crisis and Euro Zone Crisis respectively.

Each industry is required to maintain a sample of at least thirty firms throughout the period under consideration in order to establish robust statistics. For China stock market, the household goods & home construction industry has the lowest average representation with 30 firms, while the real estates & investment services industry has the largest representation with 122 firms. Secondly, for the Hong Kong stock market, the pharmaceuticals & biotechnology industry has the lowest average representation with 30 firms, while the real estates & investment services industry has the largest representation with 125 firms. Thirdly, for the Taiwan stock market, the software & computer services industry has the lowest average representation with 30 firms, while the technology hardware & equipment industry has the largest representation with 320 firms.

In the long run, book-to-market ratios for the industries indicate industry-related value effect. During the Global Financial Crisis, with the exception of Automobile and Parts Industries, the book-to-market ratios for the industries show a low level of variation across industries in China stock market. However, high levels of variation across industries are observed in the Hong Kong and Taiwan stock markets. In the China stock market, the automobiles & parts and industrial transportation have high book-to-market ratios, whereas real estates & investment services and beverages have low book-to-market ratios. In the Hong Kong stock market, real estates & investment services and personal goods have high book-to-market ratios, whereas software & computer services and pharmaceuticals & biotechnology have low book-to-market ratios. In the Taiwan stock market, personal goods and software & computer services have high book-to-market ratios, whereas real estates & investment services and technology hardware & equipment have low book-to-market ratios.

Table 10 Summary Statistics by Industry

Panel A: China Stock Market (Global Financial Crisis)

Industry Sample	Mean	BE /ME Std. Deviation (M/E - $ '000)	BE / ME Capitalisation Size	Market	Beta
Automobiles & Parts	63	0.81	4.17	2,191,666	1.11
Beverages	30	0.19	0.13	3,094,797	0.90
Construction & Materials	84	0.29	0.17	8,924,728	1.04
Electricity	54	0.30	0.11	10,807,586	1.05
Electronic & Electrical Equipment	101	0.27	0.39	271,974	1.00
Food Producers	61	0.21	0.12	441,727	0.88
General Retailers	64	0.21	0.17	533,262	0.92
Household Goods & Home Construction	30	0.23	0.17	451,072	0.97
Industrial Engineering	113	0.26	0.31	537,957	1.08
Industry Metal & Mining	78	0.28	0.19	16,957,188	1.39
Industrial Transportation	60	0.36	0.24	21,125,137	0.93
Mining	44	0.22	0.13	42,548,477	1.30
Personal Goods	71	0.26	0.21	355,764	1.01
Pharmaceuticals & Biotechnology	103	0.24	0.24	261,386	0.77
Real Estates & Investment Services	121	0.18	0.25	2,304,441	1.09
Software & Computer Services	33	0.32	0.30	221,119	0.96
Technology Hardware	59	0.23	0.57	476,683	0.94
Travel & Leisure	41	0.20	0.16	6,454,049	1.04

Panel B: Hong Kong Stock Market (Global Financial Crisis)

Industry	Sample	Mean BE /ME	BE / ME Std. Deviation	Market Capitalisation Size (M/E – $'000)	Beta
Construction & Materials	36	0.89	0.87	1,255	-1.01
Electronic & Electrical Equipment	50	1.34	1.26	327,390	-1.06
Financial Services	71	1.24	2.41	1,309,894	-0.99
Food Producers	32	0.84	0.98	2,744,897	-0.82
General Retailers	40	0.70	0.93	2,871,273	-1.07
Household Goods & Home Construction	33	0.96	0.92	345,728	-0.81
Leisure Goods	36	0.98	0.72	271,063	-0.61
Media	40	1.20	2.66	433,800	-1.14
Personal Goods	82	1.39	2.13	3,128,711	-1.09
Pharmaceuticals & Biotechnology	30	0.68	0.50	656,233	-0.72
Real Estates & Investment Services	125	1.77	2.32	10,912,388	-1.03
Software & Computer Services	49	0.50	0.58	923,950	-0.78
Technology Hardware & Equipment	58	0.93	0.97	4,483,359	-1.06
Travel & Leisure	60	0.99	0.72	5,273,053	-0.92

Panel C: Taiwan Stock Market (Global Financial Crisis)

Industry Sample	Mean	BE /ME	BE / ME Std. Deviation	Market Capitalisation Size (M/E - $'000)	Beta
Automobiles & Parts	31	0.78	0.39	287,961	0.43
Chemicals	68	0.81	0.39	4,921,413	0.62
Construction & Materials	52	0.68	0.31	1,008,449	0.60
Electronic & Electrical Equipment	265	0.79	0.40	1,074,710	0.65
Industrial Engineering	63	0.75	0.38	270,188	0.50
Industry Metal & Mining	35	0.74	0.37	6,233,981	0.64
Leisure Goods	42	0.64	0.33	59,089	0.65
Personal Goods	67	1.00	0.49	706,123	0.60
Real Estates & Investment Services	31	0.54	0.31	242,287	0.91
Software & Computer Services	30	0.85	0.41	10,715	0.69
Technology Hardware & Equipment	320	0.60	0.34	20,021	1.48

Panel D: China Stock Market (Euro Zone Crisis)

Industry	Sample	Mean BE /ME	BE / ME Std. Deviation	Market Capitalisation Size (M/E – $'000)	Beta
Automobiles & Parts	65	0.27	0.25	3,688,289	0.80
Beverages	30	0.19	0.12	3,574,802	0.25
Construction & Materials	84	0.30	0.23	7,203,395	0.63
Electricity	54	0.34	0.16	10,663,676	0.55
Electronic & Electrical Equipment	101	0.20	0.47	844,921	0.50
Food Producers	61	0.21	0.10	604,755	0.43
General Retailers	64	0.22	0.18	1,360,126	0.40
Household Goods & Home Construction	30	0.22	0.13	942,309	0.49
Industrial Engineering	113	0.30	0.26	877,960	0.66
Industry Metal & Mining	78	0.37	0.25	14,000,326	0 .92
Industrial Transportation	60	0.46	0.30	14,464,890	0.57
Mining	45	0.24	0.18	37,574,751	0.94
Personal Goods	70	0.23	0.84	420,655	0.49
Pharmaceuticals & Biotechnology	104	0.20	0.16	584,100	0.23
Real Estates & Investment Services	122	0.25	0.28	2,971,200	0.72
Software & Computer Services	33	0.28	0.31	485,468	0.36
Technology Hardware & Equipment	59	0.23	0.44	853,295	0.42
Travel & Leisure	42	0.26	0.21	8,383,353	0.57

Panel E: Hong Kong Stock Market (Euro Zone Crisis)

Industry	Sample	Mean BE /ME	BE / ME Std. Deviation	Market Capitalisation Size (M/E – $'000)	Beta
Construction & Materials	36	1.22	0.94	1,809,512	-0.55
Electronic & Electrical Equipment	50	1.36	0.93	759,051	-0.39
Financial Services	71	1.25	1.41	862,296	-0.72
Food Production	32	0.73	0.73	7,984,620	-0.29
General Retailers	40	0.78	0.77	4,164,965	-0.51
Household Goods & Home Construction	33	1.03	0.91	388,130	-0.53
Leisure Goods	36	0.62	1.56	465,615	-0.31
Media	40	0.92	0.84	572,444	-0.13
Personal Goods	82	1.82	5.49	2,963,274	-0.47
Pharmaceuticals & Biotechnology	30	0.61	0.78	570,604	-0.32
Real Estates & Investment Services	125	1.90	1.61	8,729,999	-0.28
Software & Computer Services	49	0.36	0.49	1,586,842	-0.27
Technology Hardware & Equipment	58	0.93	1.27	2,717,357	-0.51
Travel & Leisure	60	1.37	1.22	3,593,702	-0.57

Panel F: Taiwan Stock Market (Euro Zone Crisis)

Industry	Sample	Mean BE /ME	BE / ME Std. Deviation	Market Capitalisation Size (M/E – $'000)	Beta
Automobiles & Parts	31	0.76	0.36	344,519	-0.49
Chemicals	68	0.76	0.29	4,343,985	-0.59
Construction & Materials	52	0.84	0.39	646,132	-0.46
Electronic & Electrical Equipment	265	0.70	0.34	1,443,502	-0.60
Industrial Engineering	63	0.78	0.30	36,340	-0.56
Industry Metal & Mining	35	0.86	0.29	5,297,430	-0.55
Leisure Goods	42	0.56	0.37	79,195	-0.49
Personal Goods	67	1.10	0.49	555,348	-0.49
Real Estates & Investment Services	31	0.74	0.30	175,585	-0.73
Software & Computer Services	30	0.76	0.55	11,707	-0.62
Technology Hardware & Equipment	320	0.62	0.62	27,640,419	-0.61

Note:

Panel A, Panel B and Panel C report the summary statistics of China, Hong Kong and Taiwan stock markets during the Global Financial Crisis. Panel D, Panel E and Panel F report the summary statistics of China, Hong Kong and Taiwan stock markets during the during Euro Zone Crisis.

BE/ME is book-to-market equity, where book equity is measured at financial year-end in calendar year (t-1) and market equity is measured at calendar year end (t-1).ME is market capitalisation (in thousands of dollars) measured at Dec-end of year t-1. Beta is the full period beta calculated relative to the index of China, Hong Kong and Taiwan Stock Exchange Stocks respectively during Global Financial Crisis and Euro Zone Crisis. The required minimum number of firms in any industry was thirty.

The standard deviations for the book-to-market ratios reveal that automobiles & parts and technology hardware & equipment exhibit the highest within-industry variation, while the BE/MEs for electricity, food producer and mining show more within-industry consistency for the China stock market. In the Hong Kong stock market, media, financial services and real estates & investment services show the highest within-industry variation, however the BE/MEs for pharmaceuticals & biotechnology, leisure goods and travel & leisure demonstrate more within-industry consistency. Lastly, in the Taiwan stock market, personal goods and software & computer services exhibit the highest within-industry variation and the BE/MEs for construction & materials and real estates & investment services provide evidence of more within-industry consistency.

During the Euro Zone Crisis, similar pattern as the Global Financial Crisis is observed. The book-to-market ratios for the industries show a low level of variation across industries in China stock market. Nevertheless, high levels of variation across industries are seen in the Hong Kong and Taiwan stock markets. In the China stock market, the industrial transportation and industrial metal & mining have high book-to-market ratios, whereas beverages, pharmaceuticals & biotechnology and electronic & electrical equipment have low book-to-market ratios. In the Hong Kong stock market, real estates & personal goods have high book-to-market ratios, whereas software & computer services and leisure goods have low book-to-market ratios. In the Taiwan stock market, personal goods and industry metal & mining have high book-to-market ratios, whereas the leisure goods and technology hardware & equipment have low book-to-market ratios.

The standard deviations for the book-to-market ratios reveal that personal goods and electronic & electrical equipment exhibit the highest within-industry variation, while the BE/MEs for food producers, beverages and household goods & home construction show more within-industry consistency for the China stock market. In the Hong Kong stock market, personal goods and real estates & investment services show the highest within-industry variation, however the BE/MEs for software & computer services and food production demonstrate more within-industry consistency. Lastly, in the Taiwan stock market, technology hardware & equipment and software & computer services exhibit the highest within-industry variation and the BE/MEs for chemical and industry metal & mining provide evidence of more within-industry consistency.

Previous research in the finance literature has shown that the market capitalizations and betas - two firm characteristics explain cross-sectional variation in stock returns. The results show that considerable variation exists in the market capitalisation characteristic. During the Global Financial Crisis, the betas varies between 0.77 to1.39, -0.71 to -1.14 and 0.43 to 1.48 for China, Hong Kong and Taiwan stock markets respectively. On the other hand, the betas varies between 0.23 to 0.92, -0.13 to -0.72 and -0.46 to -0.73 for China, Hong Kong and Taiwan stock markets respectively.

Tables 11 reports the regression results of monthly portfolio returns against both portfolio BE/ME and industry BE/ME to determine if the value effect is firm specific, industry specific, or present at both industry and firm levels for China, Hong Kong and Taiwan stock markets, during Global Financial Crisis and Euro Zone Crisis. The standard errors are estimated in the presence of a fixed firm effect (CL-F), a time effect (CL-T) and a fixed firm and time effect (CL – F&T).For full results, please see Appendix A.

Table 11
Regression Results of Monthly Portfolio Returns on Portfolio BE/ME, Industry BE/ME, and Control Variables
Panel – OLS (Estimating Standard Errors in the Presence of a Fixed Firm and/or Time Effect)
Panel A: China stock market during Global Financial Crisis (Fixed Firm and Time Effect)

Model	BE/ME	Industry BE/ME	ME	Beta	Adjusted R-Squared
1	0.0031 (1.09)				0.68
2		-0.0099 *** (-2.78)			0.69
3	0.0043 (1.46)	-0.0121 *** (-2.91)			0.69
4	0.0045 (1.51)	-0.0098 ** (-2.57)	-0.0020 ** (-2.44)		0.69
5	0.0048 * (1.66)	-0.0115 *** (-2.88)	-0.0023 *** (-2.82)	0.0108 ** (1.82)	0.69

*Notes: Values in the parentheses are the t-statistics. *, **, *** significant at 10%, 5%, 1% respectively.*

Panel B: Hong Kong stock market during Global Financial Crisis

Model	BE /ME	Industry BE /ME	ME	Beta	Adjusted R- Squared
1	-0.0154 *** (-3.26)				0.36
2		-0.0084 (-0.71)			0.36
3	-0.0163 *** (-3.13)	0.0080 (0.63)			0.36
4	-0.0291 *** (-5.02)	0.1070 *** (3.01)	-0.0134 *** (-3.49)		0.37
5	-0.0291 *** (-4.91)	0.1087 *** (3.03)	-0.0149 *** (-3.75)	0.0024 (0.12)	0.36

*Notes: Values in the parentheses are the t-statistics. *, **, *** significant at 10%, 5%, 1% respectively.*

Panel C: Taiwan stock market during Global Financial Crisis (Fixed Firm and Time Effect)

Model	BE /ME		Industry BE /ME	ME	Beta	Adjusted R- Squared
1	0.01 (4.18)	***				0.75
2			0.0101 (1.19)			0.75
3	0.0116 (4.23)	***	-0.0024 (-0.36)			0.75
4	0.0100 (4.03)	***	-0.0026 (-0.40)	-0.0001 (-0.31)		0.75
5	0.0113 (3.54)	***	0.0007 (0.08)	-0.0001 (-0.24)	0.0082 (1.11)	0.75

*Notes: Values in the parentheses are the t-statistics. *, **, *** significant at 10%, 5%, 1% respectively.*

Global Financial Crisis

For China, the model 2, model 3, model 4 and model 5 indicate that industry BE/ME is significant in explaining equity returns. In the full model, industry BE/ME is significant after controlling for differences in portfolio ME and beta. The coefficient on industry BE/ME is approximately the same size in all the regressions, provides strong support for the robustness of the industry BE/ME variable. These results suggest that the growth effect is related to the industry characteristics, as the effects at each level are negative.

For Hong Kong, the model 1, model 3, model 4 and model 5 indicate that portfolio BE/ME is significant in explaining equity returns. In the model 4 and model 5, industry BE/ME is significant after controlling for differences in portfolio ME as well as ME and beta respectively. The coefficient on portfolio BE/ME is approximately the same size in model 1 and model3, which is -0.02 and again, about the same size in model 4 and model 5, which is -0.03 after controlling for differences in portfolio ME as well as ME and beta respectively. These results suggest that the growth effect is related to the portfolio characteristics, as the effects at each level are negativeHowever, the model 1, model 3, model 4 and model 5 of the Taiwan stock market indicate that portfolio BE/ME is significant in explaining equity returns when considered separately. The coefficient on portfolio BE/ME is approximately the same size in all the regressions, provides strong support for the robustness of the portfolio BE/ME variable. The effects at each level are positive. These results suggest that the value effect is related to the firm characteristics.

As highlighted earlier, the methodology reduced the variation in ME and beta. Therefore, the coefficients on ME and beta indicate little about the significance of these firm characteristics. The ME is statistically significant in both the China and Hong Kong stock markets show that methodology did not eliminate the variation in this measure. The adjusted R-squared of all the models in China, Hong Kong and Taiwan stock markets are in the range 0.68-0.69, 0.36-0.37 and 0.75 respectively.

Panel D: China stock market during Euro Zone Crisis (Time Effect)

Model	BE /ME	Industry BE /ME	ME	Beta	Adjusted R- Squared
1	-0.0034 (-0.50)				0.0003
2		-0.0122 (-0.47)			0.0017
3	-0.0011 (-0.25)	-0.0113 (-0.43)			0.0014
4	0.0006 (0.13)	-0.0106 (-0.40)	-0.0019 (-1.12)		0.0020
5	0.003 (0.51)	-0.0028 (0.14)	-0.0025 (-1.64)	0.013 (0.68)	0.0075

*Notes: Values in the parentheses are the t-statistics. *, **, *** significant at 10%, 5%, 1% respectively.*

Panel E: Hong Kong stock market during Euro Zone Crisis (Fixed Firm and Time Effect)

Model	BE /ME	Industry BE /ME	ME	Beta	Adjusted R- Squared
1	-0.0094 ** (-2.28)				0.0029
2		-0.0158 (-0.93)			0.0010
3	-0.0082 ** (-2.50)	-0.0082 (-0.49)			0.0027
4	-0.0116 *** (-2.63)	-0.0054 (-0.32)	-0.0037 (-1.60)		0.0052
5	-0.0124 *** (-2.61)	-0.0079 (-0.44)	-0.0036 (-1.59)	-0.0079 (-0.43)	0.0058

*Notes: Values in the parentheses are the t-statistics. *, **, *** significant at 10%, 5%, 1% respectively.*

Panel F: Taiwan stock market during Euro Zone Crisis (Time Effect)

Model	BE /ME	Industry BE /ME	ME	Beta	Adjusted R- Squared
1	0.00 (0.93)				0.0002
2		0.0244 (0.60)			0.0010
3	0.0032 (0.76)	0.0208 (0.52)			0.0007
4	0.0023 (0.54)	0.0195 (0.48)	-0.0012 * (-1.80)		0.0012
5	0.0004 (0.09)	0.0607 * (1.74)	-0.0003 (-0.58)	0.0324 ** (2.02)	0.0882

Notes: Values in the parentheses are the t-statistics., **, *** significant at 10%, 5%, 1% respectively*

Panel A, Panel B and Panel C report the regression results of China, Hong Kong and Taiwan stock markets during the Global Financial Crisis. Panel D, Panel E and Panel F report the regression results of China, Hong Kong and Taiwan stock markets during the during Euro Zone Crisis.

Coefficients (t-statisctic) are presented from the OLS using monthly cross section time series data:

$$R_{pt} = \alpha_0 + \beta_1 BE/ME_{pt} + \beta_2 IndBE/ME_{pt} + \beta_3 ME_{pt} + \beta_4 Beta_p + \varepsilon_{pt}$$

R_{pt} is the equally weighted return on the B/M pt portfolio p calculated from calculated from Jan of year t though Dec of year t. BE/ME_{pt} and $Ind\ BE/ME_{pt}$ are the natural log of book-to-market for portfolio p and for the industry that includes portfolio, p, respectively. For both measures, BE is measured at fiscal year-end in calendar (t-1), which is at least six months prior to the return measurement at fiscal year-end in calendar year (t-1). ME_{pt} is the natural log of the market capitalization of portfolio p at Dec –end of year t-1. $Beta_p$ is the full period beta for portfolio p calculated relative to the index of the China, Hong Kong and Taiwan Stock Exchange stocks respectively during the Global Financial Crisis and Euro Zone Crisis. Portfolios are formed as quintiles of B/M ranked firms within each of 18, 14 and 11 industries respectively for the China, Hong Kong and Taiwan stock markets. The portfolios are reformed annually. During the Global Financial Crisis, there are 3,240 observations in each regression (18 industries times 5 portfolio times 36 months) in the China stock markets, 2,520 observations in each regression (14 industries times 5 portfolio times 36 months) in the Hong Kong stock market and 1,980 observations in each regression (11 industries times 5 portfolio times 36 months) in the Taiwan stock market. During the Euro Zone Crisis, there are 2,880 observations in each regression (18 industries times 5 portfolio times 32 months) in the China stock market, 2,240 observations in each regression (14 industries times 5 portfolio times 32 months) in the Hong Kong stock market and 1,760 observations in each regression (11 industries times 5 portfolio times 32 months).

Euro Zone Crisis

For China, the models indicate that none of the variables is significant in explaining equity returns when considered separately.

The model 1, model 3, model 4 and model 5 of the Hong Kong stock market indicate that portfolio BE/ME is significant in explaining equity returns when considered separately. The coefficient on portfolio BE/ME is approximately the same size in all the regressions. These results suggest that the growth effect is related to the firm characteristics, as the effects at each level are negative.

For Taiwan, the model 5 indicates that only industry BE/ME is significant at 10% level in explaining equity returns when considered separately. The other models indicate that none of the variables is significant in explaining equity returns when considered separately.

As the methodology reduced the variation in ME and beta, the coefficients on ME and beta indicate little about the significance of these firm characteristics. The beta is statistically significant in the Taiwan stock market shows that methodology did not eliminate the variation in this measure. The adjusted R-squared of all the models in China, Hong Kong and Taiwan is extremely low.

Next, based on the premise that BE/ME (book-to-market ratio), Industry BE /ME (Industry book-to-market ratio), ME (market capitalilsation) and Beta are risk measures, this research examines the prevalence of the value effect across the sample of industries during two major financial crises.

Tables 12 reports the cross-sectional, time-series OLS regressions within each of the 18, 14 and 11 different industries for China, Hong Kong and Taiwan stock markets for the Global Financial Crisis and Euro Zone Crisis. The standard errors are estimated in the presence of a fixed firm effect (CL-F), a time effect (CL-T) and a fixed firm and time effect (CL – F&T).For full results, please see Appendix B.

Global Financial Crisis

In China, only one industry has a significant portfolio BE/ME coefficient at 15 level. Furthermore, there are 9 industries have a significant industry BE/ME coefficient at 1% level and 4 industries at 5% level. There is considerable variation in the size of the industrial BE/ME coefficient, ranging from a high of 0.48 for the mining industry to a low of -0.05 for the automobile and parts industry.

In addition, only one industry has a significant ME coefficient. Size effect is observed, as the coefficient is negative. Also, 2 of the 18 industries have a significant negative beta coefficient. Another 4 industries have marginally negative significant coefficient on beta. Finally, there is considerable variation in the size of the adjusted R-squared, in the range of -0.02 to 0.08.

In Hong Kong, 3 of the 14 industries have a significant portfolio BE/ME coefficient and four are weakly significant. Amongst them, seven industries have a significant growth effect, as the coefficients are negative.

As for the industry BE/ME coefficient, 8 of the 14 industries are significant. Furthermore, 2 of the 14 industries have a significant ME coefficient. Only one of them has a significant size effect, with a negative coefficient.

Lastly, only financial services industry has a significant beta coefficient and three industries are marginally significant. The variation in the size of the adjusted R-squared is in the range of 0.04 to 0.17.

In Taiwan, 3 of the 11 industries have a significant portfolio BE/ME coefficient and one is marginally significant. All the three have value effects as the coefficients are positive. As for the industry BE/ME coefficient, 5 of the 11 industries have a significant industry BE/ME coefficient. Furthermore, only one industry has a marginally significant ME coefficient and the other three industries are weakly significant. As of the beta coefficient, one industry is significant, marginally significant and weakly significant each. The variation in the size of the adjusted R-squared is in the range of 0.07 to 0.20.

Euro Zone Crisis

In China, almost all the 18 industries do not have a significant portfolio BE/ME and industry BE /ME coefficients. The food producers industry has a marginally negative ME coefficient at 5% level. Size effect is observed as the coefficient is negative. Also, the food producers industry has a marginally negative significant ME coefficient at 5% level. Furthermore, the industrial engineering industry has a marginally significant beta coefficient at 5% level. The variation in the size of the adjusted R-squared is in the range of -0.02 to 0.08

In Hong Kong, one industry has a significant portfolio BE/ME coefficient and 4 of the 14 industries are marginally significant. All the five industries have a significant growth effect, as the coefficients are negative. As for the industry BE/ME coefficient, 2 of the 14 industries are marginally significant and one industry is weakly significant. Furthermore, 3 and 2 of the 14 industries have a marginally and weakly significant ME coefficient. All the five have a significant size effect, as the coefficients are negative. Lastly, 2 of the 14 industries have a marginally significant beta coefficient. The variation in the size of the adjusted R-squared is in the range of 0.01-0.09.

In Taiwan, only one industry has a significant negative portfolio BE/ME coefficient. Hence, it has a growth effect. None of the industry BE/ME coefficient has a significant industry BE/ME coefficient. Two industries have a significant ME coefficient. Lastly, four industries each have a marginally and weakly coefficient beta coefficient. The variation in the size of the adjusted R-squared is in the range of -0.18 to 0.82.

Table 12 Regression Results of Monthly Portfolio Returns on Portfolio BE/ME and Control Variables by Industry
Panel – OLS (Estimating Standard Errors in the Presence of a Fixed Firm and/or Time Effect)

Panel A: China stock market during Global Financial Crisis

Industry	BE /ME	Industry BE /ME	ME	Beta	Adjusted R-Squared	Standard Errors
Auto & Parts	0.0313 *	-0.0563 ***	-0.0046	-0.1936***	0.2007	CL - T
	(1.92)	(-3.79)	(-0.52)	(-11.89)		
Beverages	0.0054	0.1537 ***	-0.0015	-0.0937 **	0.2008	CL - T
	(0.72)	(2.82)	(-0.70)	(-1.98)		
Con & Materials	0.0169	0.2250 **	-0.0055 *	-0.0036	0.0616	CL-T
	(1.12)	(2.06)	(-1.89)	(-0.05)		
Electricity	-0.0096	0.2868 *	-0.0026 ***	-0.0906**	0.1441	CL - T
	(-0.63)	(1.88)	(-2.82)	(-2.40)		
Elec. & Electrical Equipment	-0.0028	0.1464	0.0053	-0.2551**	0.1650	CL - T
	(-0.47)	(1.58)	(1.32)	(-2.49)		
Food Producers	0.0112	0.1488 *	-0.0011	-0.0821	0.1066	CL - T
	(1.45)	(1.65)	(-0.19)	(-1.21)		
General Retailers	-0.0078	0.0251 ***	-0.0042	-0.0939	0.2068	CL - T
	(-1.36)	(2.85)	(-1.45)	(-1.47)		
Household Goods & Home Construt.	-0.0044	0.1737 **	-0.0001	-0.1193**	0.1409	CL - T
	(-0.40)	(2.16)	(-0.01)	(-2.00)		
Industrial Engin.	0.0029	0.2675 ***	0.0097	0.0009	0.1525	CL - T
	(0.33)	(2.80)	(0.90)	(0.12)		
Ind.Metal & Mining	-0.0098	0.3335 ***	-0.0022	0.0557*	0.1898	CL - T
	(-0.92)	(2.84)	(-0.42)	(1.70)		
Ind. Transportation	-0.0066	0.1795 **	0.0003	-0.0842	0.1855	CL - T
	(-0.39)	(2.27)	(0.16)	(-0.84)		
Mining	-0.0016	0.4842 ***	-0.0017	0.1158	0.1733	CL - T
	(-0.14)	(2.99)	(-0.75)	(1.06)		
Personal Goods	0.0075	0.0884 *	0.0094 *	-0.2190***	0.3089	CL - T
	(1.61)	(1.77)	(1.91)	(-3.11)		
Pharma & Biotech	0.0206 ***	0.1206 *	0.0113	-0.0795	0.1222	CL - T
	(3.33)	(1.90)	(1.09)	(-1.62)		
Real Estates &	0.0584	0.2366 ***	-0.0314	-0.0007	0.1304	CL - T
	(1.24)	(3.09)	(-1.42)	(-0.09)		
Software & Computer Services	-0.0098	0.1407 **	0.0015	-0.0812 *	0.1021	CL - T
	(-0.95)	(2.45)	(0.18)	(-1.78)		
Tech Hardware & Equipment	-0.0126	0.1873 ***	-0.0010	-0.0795	0.1637	CL - T
	(-1.17)	(2.97)	(-0.18)	(-1.48)		

Travel & Leisure	0.0110	*	0.2418	***	-0.0013		0.0118	0.2356	CL - T
	(1.84)		(2.64)		(-0.27)		(0.36)		

*Notes: Values in the parentheses are the t-statistics. *, **, *** significant at 10%, 5%, 1% respectively.*

Panel B: Hong Kong stock market during Global Financial Crisis

Industry	BE /ME		Industry BE /ME		ME		Beta	Adjusted R-Squared	Standard Errors
Cons & Mat	-0.0373	*	0.29	***	-0.0018		-0.0220	0.1210	CL - T
	(-1.83)		(2.85)		(-0.30)		(-0.88)		
E & E Equipment	0.0197		0.1848	***	0.0096		-0.0029	0.1025	CL - T
	(0.64)		(5.97)		(0.54)		(-0.11)		
Financial Services	-0.0227	***	0.1841	***	0.0084	***	-0.0911***	0.0775	CL - T
	(-3.62)		(5.66)		(2.58)		(-9.65)		
Food Producers	0.0363	*	0.0083		0.0154		0.1100**	0.1119	CL - T
	(1.82)		(0.17)		(1.64)		(2.46)		
General Retailers	-0.0068		0.1231	*	-0.0150	***	-0.0487**	0.1104	CL - T
	(-0.62)		(1.72)		(-2.60)		(-2.13)		
H G & H Cons	0.0102		0.1631	**	0.0061		0.0149	0.1013	CL - T
	(0.98)		(2.50)		(0.76)		(0.57)		
Leisure Goods	-0.0293		0.2046	***	0.0040		0.0126	0.0375	CL - T
	(-0.97)		(2.88)		(0.18)		(0.31)		
Media	-0.0690	*	0.3630	***	-0.0320		0.0110	0.0742	White
	(-1.87)		(3.23)		(-1.00)		(0.36)		
Personal Goods	-0.0445	***	0.1828	**	-0.0086	*	-0.0147	0.0543	CL - T
	(-3.62)		(2.36)		(-1.66)		(-0.41)		
Pharma & Biotech	0.0114		0.2235	**	0.0093		0.0033	0.0795	CL - T
	(1.26)		(2.24)		(1.31)		(0.13)		
Real Est. & Inv S	0.0196		0.3753	***	0.0193		0.0856	0.1398	CL - T
	(1.06)		(2.59)		(1.47)		(1.31)		
Software & C Ser	0.0063		0.1475	*	0.0101		0.0830**	0.0399	CL - T
	(0.41)		(1.92)		(1.36)		(1.96)		
Tech Hard. & Equip	-0.0216	***	0.1490	***	-0.0027		0.0159	0.1129	CL - T
	(-3.00)		(2.85)		(-0.53)		(0.69)		
Travel & Leisure	-0.0190	*	0.2373	***	-0.0064		0.0104	0.1660	CL - T
	(-1.81)		(2.89)		(-0.60)		(0.54)		

*Notes: Values in the parentheses are the t-statistics. *, **, *** significant at 10%, 5%, 1% respectively.*

Panel C: Taiwan stock market during Global Financial Crisis

Industry	BE /ME	Industry BE /ME	ME	Beta	Adjusted R-Squared	Standard Errors
Auto & Parts	0.0114	0.1360 **	0.0013	0.0615*	0.1540	CL - T
	(1.02)	(2.47)	(0.47)	(1.94)		
Chemicals	0.0498 *	0.1006 *	0.0067 *	0.0494	0.0961	CL - T
	(2.27)	(1.82)	(1.67)	(1.63)		
Cons & Mat	0.0247 *	0.1305 **	0.0084 *	-0.0675	0.1059	CL - T
	(1.80)	(1.96)	(1.65)	(-1.18)		
E & E Equipment	0.0227 ***	0.1471 ***	0.0026	-0.0247	0.1640	CL - T
	(2.86)	(2.61)	(1.42)	(-0.83)		
Ind Engineering	-0.0529	0.1956 ***	-0.0302 *	0.0847	0.1219	CL - T
	(-1.57)	(2.87)	(-1.73)	(1.27)		
Ind Metal & Mining	0.0403 ***	0.1262 *	-0.0010	0.0230	0.0860	CL - T
	(3.64)	(1.69)	(-0.49)	(0.85)		
Leisure Goods	0.0094	0.1896 ***	0.0015	0.0277	0.1524	CL - T
	(1.04)	(2.74)	(0.28)	(1.12)		
Personal Goods	0.0345 ***	0.1250 *	0.0082 **	0.0082***	0.1116	CL - T
	(2.62)	(1.95)	(2.14)	(2.97)		
Real Est. & Inv S	-0.0085	0.1817 ***	0.0047	-0.0177**	0.1188	CL - T
	(-0.67)	(6.77)	(0.64)	(-2.35)		
Software & CS	0.0075	0.1771 **	-0.0022	0.0410	0.0730	CL - T
	(0.81)	(2.36)	(-0.43)	(1.36)		
Tech Hard & Equip	0.0095	0.1842 ***	-0.0022	-0.0711	0.2045	CL - T
	(1.38)	(2.89)	(-1.24)	(-1.35)		

*Notes: Values in the parentheses are the t-statistics. *, **, *** significant at 10%, 5%, 1% respectively.*

Panel D: China stock market during Euro Zone Crisis

Industry	BE /ME	Industry BE /ME	ME	Beta	Adjusted R-Squared	Standard Errors
Auto & Parts	0.1042	0.0554	-0.0048	0.0372	0.0249	CL - T
	(1.09)	(0.74)	(-1.38)	(1.41)		
Beverages	-0.0145 *	0.0709	-0.0044	-0.0030	-0.0106	CL - T
	(-1.66)	(0.69)	(-1.07)	(-0.14)		
Cons & Materials	0.0136	0.0677	-0.0047	0.0330	0.0150	CL-T
	(0.95)	(0.83)	(-1.52)	(1.11)		
Electricity	-0.0003	0.1572	0.0073	0.0543	-0.0183	CL - T
	(-0.02)	(1.07)	(0.98)	(0.86)		
E & E Equipment	0.0049	omitted	-0.0062	0.1356	0.0671	CL - T
	(0.99)		(-1.10)	(1.35)		
Food Producers	0.0069	0.1102	-0.0208 **	0.0450	0.0119	CL - T
	(1.19)	(0.86)	(-1.97)	(1.33)		
General Retailers	0.0050	0.0290	-0.0019	0.0219	-0.0216	CL - T
	(0.80)	(0.46)	(-0.99)	(0.71)		
Household Goods & Home Construct	0.0107	0.0206	-0.0045	0.0377	0.0054	CL - T
	(0.86)	(0.29)	(-1.04)	(1.26)		
Industrial Engin	0.0074	0.0844	-0.0022	0.0510**	0.0750	CL - T
	(1.23)	(0.89)	(-1.07)	(1.99)		
Ind Metal & Mining	-0.0065	0.0342	0.0002	0.0231	-0.0063	CL - T
	(-0.79)	(0.31)	(0.07)	(0.68)		
Ind Transportation	0.0032	0.0338	-0.0004	0.0201	-0.0209	CL - T
	(0.25)	(0.42)	(-0.14)	(0.57)		
Mining	0.0026	0.0421	0.0029	0.0244	-0.0071	CL - T
	(0.20)	(0.30)	(1.10)	(0.78)		
Personal Goods	0.0028	0.0384	-0.0039	0.0252	-0.0174	CL - T
	(0.31)	(0.73)	(-0.49)	(0.89)		
Pharma & Bio	0.0163	-0.0141	-0.0282	-0.0258	-0.0134	CL - T
	(0.98)	(-0.21)	(-0.77)	(-0.64)		
Real Est & Inve. Ser	-0.0102	0.0096	0.0022	-0.0186	-0.0043	CL - T
	(-1.37)	(0.14)	(0.77)	(-1.02)		
Software & Com Ser	-0.0142 *	-0.0321	-0.0026	0.0023	-0.0036	CL - T
	(-1.75)	(-0.48)	(-0.40)	(0.09)		
Tech Hardware & Equipment	0.0143	0.0241	-0.0049	0.0527	*0.0237	CL - T
	(1.12)	(0.43)	(-1.26)	(1.87)		
Travel & Leisure	0.0099	0.0917	-0.0003	0.0603	0.0218	CL - T
	(1.24)	(1.12)	(-0.14)	(1.59)		

*Notes: Values in the parentheses are the t-statistics. *, **, *** significant at 10%, 5%, 1% respectively*

.Panel E: Hong Kong stock market during Euro Zone Crisis

Industry	BE /ME	Industry BE /ME	ME	Beta	Adjusted R-Squared	Standard Errors
Con & Mat	-0.0460 **	-0.0503	-0.0132	-0.0727**	0.0900	CL - T
	(-2.09)	(-0.85)	(-1.28)	(-2.48)		
E & E Equipment	0.0176	-0.0928	0.0056	-0.0250	-0.0120	CL - T
	(0.62)	(-1.18)	(0.35)	(-0.97)		
Financial Services	-0.0088	-0.1185	-0.0017	-0.0751**	0.0238	White
	(-0.26)	(-1.16)	(-0.05)	(-2.57)		
Food Producers	-0.0185	-0.0394	-0.0058	0.0104	0.0191	CL - T
	(-1.29)	(-0.74)	(-0.78)	(0.51)		
General Retailers	0.0001	-0.1907	-0.0133 *	-0.0311*	0.0315	CL - T
	(0.00)	(-1.53)	(-1.65)	(1.68)		
H G & Home Conon	-0.0289 **	-0.0500 *	-0.0170 *	-0.0323	0.0111	CL - T
	(-2.05)	(-0.91)	(-1.65)	(-1.23)		
Leisure Goods	-0.0300 ***	0.0029	-0.0147 **	-0.0005	0.0202	CL - T
	(-9.59)	(0.17)	(-2.18)	(-0.04)		
Media	-0.0227	-0.0541	-0.0194	0.0150	0.0348	CL - T
	(-1.34)	(-1.22)	(-1.05)	(0.77)		
Personal Goods	-0.0413 *	-1.2105 **	-0.0204 **	0.0514	0.0174	CL - T
	(-1.87)	(-2.79)	(-2.63)	(0.81)		
Pharma & Biotech	-0.0004	-0.1229	0.0011	-0.0266	0.0129	CL - T
	(-0.03)	(-1.44)	(0.13)	(-0.91)		
Real Est. & Inv. S	-0.0238	0.1716	-0.0124	0.0439	0.0143	CL - T
	(-1.44)	(1.18)	(-1.13)	(0.91)		
Software & CSs	-0.0123	-0.0626 **	-0.0016	-0.0273	0.0546	CL - T
	(-0.98)	(-2.10)	(-0.17)	(-1.37)		
Techy Hard & Equip	-0.0140 **	-0.0862	-0.0050	-0.0248	0.0248	CL - T
	(-2.05)	(-1.13)	(-1.08)	(-0.99)		
Travel & Leisure	-0.0230 **	0.3689	-0.0130 **	0.0761	0.0111	CL - T
	(-2.46)	(1.72)	(-2.12)	(1.34)		

*Notes: Values in the parentheses are the t-statistics. *, **, *** significant at 10%, 5%, 1% respectively.*

Panel F: Taiwan stock market during Euro Zone Crisis

Industry	BE /ME	Industry BE /ME	ME	Beta	Adjusted R-Squared	Standard Errors
Auto & Parts	-0.0040 (-0.42)	0.1921 (0.39)	0.0032 (1.13)	0.0255 (1.12)	0.0079	CL - T
Chemicals	0.0061 (0.65)	0.1846 (0.50)	0.0008 (0.65)	0.0332* (1.80)	0.0934	CL - T
Con & Mat	-0.0086 (-1.23)	0.0904 (0.41)	-0.0008 (-0.28)	0.0439* (1.87)	0.0895	CL - T
E & E Equipment	-0.0011 (-0.19)	0.1406 (0.91)	0.0027 * (1.80)	0.0449** (2.31)	0.1180	CL - T
Ind Engineering	-0.0043 (-0.42)	0.1529 (0.46)	-0.0021 (-0.56)	0.0332 (1.61)	0.0477	CL - T
Ind Metal & Mining	0.0016 (0.16)	0.1107 (0.47)	-0.0031 * (-1.70)	0.0340* (1.95)	0.0996	CL - T
Leisure Goods	-0.0024 (-0.41)	0.1444 (0.82)	0.0021 (0.38)	0.0376* (1.71)	0.0996	CL - T
Personal Goods	0.0033 (0.38)	0.1275 (0.75)	-0.0026 (-1.03)	0.0328 (1.06)	-0.1766	CL - T
Real Est. & Inv. S	-0.0168 **** (-3.43)	-	0.0060 (-1.41)	-0.0135** (-2.39)	0.8232	CL - F&T
Software & CS	-0.0007 (-0.05)	0.5349 (1.13)	0.0074 (1.36)	0.0505** (2.07)	-0.0437	CL - T
Tech Hard & Equip	0.0094 (1.44)	0.1423 (0.74)	-0.0003 (-0.41)	0.0380** (2.15)	-0.0887	CL - T

Panel A, Panel B and Panel C report the regression results of China, Hong Kong and Taiwan stock markets during the Global Financial Crisis. Panel D, Panel E and Panel F report the regression results of China, Hong Kong and Taiwan stock markets during the during Euro Zone Crisis.

Coefficients (t-statisctic) are presented from the OLS using monthly cross section time series data:

$$R_{pt} = \alpha_0 + \beta_1 BE/ME_{pt} + \beta_2 IndBE/ME_{pt} + \beta_3 ME_{pt} + \beta_4 Beta_p + \varepsilon_{pt}$$

R_{pt} is the equally weighted return on the B/M pt portfolio p calculated from calculated from Jan of year t though Dec of year t. BE/ME_{pt} and $Ind\ BE/ME_{pt}$ are the natural log of book-to-market for portfolio p and for the industry that includes portfolio, p, respectively. For both measures, BE is measured at fiscal year-end in calendar (t-1), which is at least six months prior to the return measurement at fiscal year-end in calendar year (t-1). ME_{pt} is the natural log of the market capitalization of portfolio p at Dec –end of year t-1. $Beta_p$ is the full period beta for portfolio p calculated relative to the index of the China, Hong Kong and Taiwan Stock Exchange stocks respectively during the Global Financial Crisis and Euro Zone Crisis. Portfolios are formed as quintiles of B/M ranked firms within each of 18, 14 and 11 industries respectively for the China, Hong Kong and Taiwan stock markets. The portfolios are reformed annually. During the Global Financial Crisis, there are 3,240 observations in each regression (18 industries times 5 portfolio times

36 months) in the China stock markets, 2,520 observations in each regression (14 industries times 5 portfolio times 36 months) in the Hong Kong stock market and 1,980 observations in each regression (11 industries times 5 portfolio times 36 months) in the Taiwan stock market. During the Euro Zone Crisis, there are 2,880 observations in each regression (18 industries times 5 portfolio times 32 months) in the China stock market, 2,240 observations in each regression (14 industries times 5 portfolio times 32 months) in the Hong Kong stock market and 1,760 observations in each regression (11 industries times 5 portfolio times 32 months). The standard errors are estimated in the presence of a fixed firm effect (CL-F), a time effect (CL-T) and a fixed firm and time effect (CL – F&T).

5.4.2 Fama and French Three Factor Model (1992, 1993)

Overall Firm

Table 13 reports the summary statistics for each of the factors. Panel A and Panel B show monthly mean, standard deviation and t-mean (ratio of the mean to its standard error) statistics for each factor for Global Financial Crisis and Euro Zone Crisis respectively.

The market risk premium /excess market return factor shows significant t-statistics for China, Hong Kong and Taiwan stock markets during the Global Financial Crisis and Euro Zone Crisis. In addition, the SMB factor is weakly significant in Hong Kong stock market during the Global Financial Crisis and Euro Zone Crisis.

Table 13 Fama and French - Three Factor Model
Summary Statistics - Averages, standard deviations and t-statistics for month returns

Panel A: Global Financial Crisis

	China			Hong Kong			Taiwan		
	Rm- Rf	SMB	HML	Rm- Rf	SMB	HML	Rm- Rf	SMB	HML
Mean	0.0467***	0.0111**	0.0058	0.0556***	1.0528*	-0.0267	0.0633***	0.0264	-0.0381
Std dev	0.0138	0.0247	0.0348	0.0164	2.8525	0.6192	0.0091	0.0862	0.1234
t-Stat	(17.6)	(2.2)	(0.8)	(16.7)	(1.8)	(-0.2)	(34.7)	(1.5)	(-1.5)

Panel B: Euro Zone Crisis

	China			Hong Kong			Taiwan		
	Rm- Rf	SMB	HML	Rm- Rf	SMB	HML	Rm- Rf	SMB	HML
Mean	0.0613***	0.0010	0.0003	0.0584***	0.0 294*	0.0190	0.0677***	0.0087*	0.0010
Std dev	0.0162	0.0585	0.0325	0.0144	0.0744	0.0614	0.0066	0.0249	0.0324
t-Stat	(18.9)	(0.0)	(0.0)	(20.2)	(1.9)	(1.5)	(51.2)	(1.7)	(0.1)

Table 13 reports the summary statistics for each of the factors. Panel A and Panel B show monthly mean, standard deviation and t-mean (ratio of the mean to its standard error) statistics for each factor for Global Financial Crisis and Euro Zone Crisis respectively. Rm- Rf (MRP) is the market return in excess of the risk-free rate (Market Risk Premium), small minus big (SMB) is the difference between the return on a portfolio of small market capitalisation stocks and the return on a portfolio of big market capitalisation stocks and high minus low (HML) is the difference between the return on a portfolio of high book-to-market stocks and the return on a portfolio of low book-to-market stocks.

Table 14 Regression Results of Monthly Portfolio Returns on Market Risk Premium / Excess Market Return (MRP), Market Capitalisation (SMB) and Book-to-Market (HML)

Panel – OLS (Estimating Standard Errors in the Presence of a Fixed Firm and/or Time Effect)

Panel A: Global Financial Crisis

Stock Market	MRP	SMB	HML	Adjusted R2	Std. Errors
China	-0.9311 (-0.61)	-2.0574 * (-1.90)	-0.0450 (-0.06)	0.1408	CL-T
Hong Kong	-	0.0028 ** (1.97)	-0.0829 *** (-9.39)	0.5743	CL-F&T
Taiwan	-5.1699 *** (-2.84)	-0.507 (-1.24)	-0.6095 *** (-2.67)	0.0792	CL - T

Panel B: Euro Zone Crisis

Stock Market	MRP	SMB	HML	Adjusted R2	Std. Errors
China	19.1574*** (6.42)	0.3156 (0.84)	-0.2488 (-0.10)	0.3556	CL - T
Hong Kong	-1.3567 (-1.47)	0.1290 (0.54)	-0.1879 (-0.94)	0.0263	CL - T
Taiwan	-4.7456 *** (-26.14)	-0.6738 *** (-16.12)	-0.1405 (-1.40)	0.1846	CL - T

*Note: Values in the parentheses are the t-statistics. *, **, *** significant at 10%, 5%, 1% respectively.*

Table 14 shows the regression results of monthly portfolio returns on market risk premium/excess market return (MRP), market capitalisation (SMB) and book-to-market (HML).Coefficients (t-statistics) are presented from the OLS using monthly cross section time series data for China , Hong Kong and Taiwan stock markets during Global Financial Crisis and Euro Zone Crisis. OLS regressions are presented for each of the stock market, where a separate regression is estimated for each of them. The standard errors are estimated in the presence of a fixed firm effect (CL-F), a time effect (CL-T) and a fixed firm and time effect (CL – F&T).

Table 14 shows the regression results of monthly portfolio returns on market risk premium/ excess market return (MRP), market capitalisation (SMB) and book-to-market (HML).Coefficients (t-statisctics) are presented from the OLS standard errors using monthly cross section time series data for China, Hong Kong and Taiwan stock markets during Global Financial Crisis and Euro Zone Crisis. OLS regressions are presented for each of the stock market, where a separate regression is estimated for each of them. The standard errors are estimated in the presence of a fixed firm effect (CL-F), a time effect (CL-T) and a fixed firm and time effect (CL – F&T).For full results, please see Appendix C.

The market risk premium (excess market return) factor is negatively significant in the Taiwan stock market during both the Global Financial Crisis and Euro Zone Crisis. However, the factor is positively significant in the China stock market during the Euro Zone Crisis.

During the Global Financial Crisis, the SMB factor is weakly significant in the China stock market and marginally significant in the Hong Kong stock market respectively. As the SMB factor has a negative coefficient, it shows size effect. However, the SMB factor shows a negative coefficient during the Euro Zone Crisis and therefore, a size effect.

HML factor is negatively significant in Hong Kong and Taiwan stock markets during the Global Financial Crisis. Therefore, the growth effect is observed in both the Hong Kong and Taiwan stock markets.

The adjusted R-squared for the China, Hong Kong and Taiwan stock markets are 0.14, 0.57 and 0.08 respectively during the Global Financial Crisis. During the Euro Zone Crisis, the adjusted R-squared improves to 0.36, 0.03 and 0.19 respectively.

Market Capitalisation

Table 15 reports the summary statistics for each of the factors. The summary statistics are monthly mean, standard deviation and t-mean (ratio of the mean to its standard error) statistics for each factor for Global Financial Crisis and Euro Zone Crisis respectively. Panel A and Panel B report the summary statistics of small market capitalisation and big market capitalisation portfolios during Global Financial Crisis. Panel C and Panel D report the summary statistics of small market capitalisation and big market capitalisation portfolios during Euro Zone Crisis.

Only the market risk premium /excess market return shows significant t-statistics for small and big capitalisation portfolios of China, Hong Kong and Taiwan stock markets during the Global Financial Crisis and Euro Zone Crisis.

Table 15 Fama and French - Three Factor Model - Market Capitalisation
Summary Statistics - Averages, standard deviations and t-statistics for month returns

Panel A: Global Financial Crisis - Small Cap

	China			Hong Kong			Taiwan		
	Rm- Rf	SMB	HML	Rm- Rf	SMB	HML	Rm- Rf	SMB	HML
Mean	0.0467***	0.0144	0.0339	0.0556***	0.0636	-0.0872	0.0507***	0.0864	-0.0922
Std dev	0.0138	0.0497	0.1025	0.0165	0.1156	0.1205	0.0267	0.3831	0.3772
t-Stat	(7.5)	(0.6)	(0.7)	(7.5)	(1.2)	(-1.6)	(4.2)	(0.5)	(-0.5)

Panel B: Global Financial Crisis - Big Cap

	China			Hong Kong			Taiwan		
	Rm- Rf	SMB	HML	Rm- Rf	SMB	HML	Rm- Rf	SMB	HML
Mean	0.0467***	0.0139	-0.0031	0.0556***	0.0047	-0.0231	0.0507***	-0.0022	-0.0158
Std dev	0.0138	0.0449	0.0453	0.0165	0.1339	0.0720	0.0267	0.0492	0.0387
t-Stat	(7.5)	(0.6)	(-0.1)	(7.5)	(0.0)	(-0.7)	(4.2)	(0.0)	(-0.8)

Panel C: Euro Zone Crisis - Small Cap

	China			Hong Kong			Taiwan		
	Rm- Rf	SMB	HML	Rm- Rf	SMB	HML	Rm- Rf	SMB	HML
Mean	0.0600***	0.0106	0.0035	0.0584***	0.0548	-0.0506	0.0677***	0.0197	0.0023
Std dev	0.0160	0.0298	0.0372	0.0144	0.1526	0.0741	0.0066	0.0560	0.0452
t-Stat	(8.3)	(0.7)	(0.2)	(9.0)	(0.8)	(-1.5)	(22.9)	(0.7)	(0.1)

Panel D: Euro Zone Crisis - Big Cap

	China			Hong Kong			Taiwan		
	Rm- Rf	SMB	HML	Rm- Rf	SMB	HML	Rm- Rf	SMB	HML
Mean	0.0600***	0.0071	-0.0090	0.0584***	0.0213	0.0097	0.0677***	-0.0032	-0.0003
Std dev	0.0160	0.0453	0.0515	0.0144	0.0782	0.1367	0.0066	0.0258	0.0341
t-Stat	(8.3)	(0.3)	(-0.3)	(9.0)	(0.6)	(0.1)	(22.9)	(-0.2)	(0.0)

Table 15 reports the summary statistics for each of the factors. The summary statistics are monthly mean, standard deviation and t-mean (ratio of the mean to its standard error) statistics for each factor for Global Financial Crisis and Euro Zone Crisis respectively. Panel A and Panel B report the summary statistics of small market capitalisation and big market capitalisation portfolios during Global Financial Crisis. Panel C and Panel D report the summary statistics of small market capitalisation and big market capitalisation portfolios during Euro Zone Crisis. Rm- Rf (MRP) is the market return in excess of the risk-free rate (Market Risk Premium), small minus big (SMB) is the difference between the return on a portfolio of small market capitalisation stocks and the return on a portfolio of big market capitalisation stocks and high minus low (HML) is the difference between the return on a portfolio of high book-to-market stocks and the return on a portfolio of low book-to-market stocks.

Table 16 shows the regression results of monthly portfolio returns on market risk premium /excess market return (MRP), market capitalisation (SMB) and book-to-market (HML). Panel A and Panel B report the regression results of small market capitalisation and big market capitalisation portfolios during Global Financial Crisis. Panel C and Panel D report the regression results of small market capitalisation and big market capitalisation portfolios during Euro Zone Crisis. The standard errors are estimated in the presence of a fixed firm effect (CL-F), a time effect (CL-T) and a fixed firm and time effect (CL – F&T). For full results, please see Appendix C.

The market risk premium /excess market return factor exhibits marginally significant t-statistics for small market capitalisation portfolios of the Hong Kong stock market during the Global Financial Crisis and Euro Zone Crisis.

The SMB factor is negatively significant for the small capitalisation portfolios of the China and Taiwan stock markets during Global Financial Crisis and Euro Zone Crisis. Therefore, size effect is observed. In addition, the big capitalisation portfolios of Taiwan stock market have significant SMB factor during the Global Financial Crisis. During the Euro Zone Crisis, the capitalisation portfolios of China stock market have significant SMB factor

Table 16 Regression Results of Monthly Portfolio Returns on Market Risk Premium / Excess Market Return (MRP), Market Capitalisation (SMB) and Book-to-Market (HML) - Market Capitalisation
Panel – OLS (Estimating Standard Errors in the Presence of a Fixed Firm and/or Time Effect)

Panel A: Global Financial Crisis - Small Cap

Stock Market	MRP	SMB	HML	Adjusted R2	Std. Errors
China	-0.4123 (-0.28)	-1.1222 *** (-2.71)	0.4098 *** (3.44)	0.1822	CL - T
Hong Kong	-2.1702 ** (-2.05)	0.0627 (0.19)	-0.1277 (-0.51)	0.0925	CL - T
Taiwan	0.4695 (1.31)	-1.6075 *** (-6.97)	-1.8956 *** (-12.26)	0.4122	CL-F&T

Panel B: Global Financial Crisis - Big Cap

Stock Market	MRP	SMB	HML	Adjusted R2	Std. Errors
China	-0.3393 (-0.25)	0.3005 (0.50)	0.0560 (0.09)	-0.0033	CL - T
Hong Kong	-1.5470 (-1.09)	-0.0937 (-0.46)	0.3810 (0.91)	0.0476	CL - T
Taiwan	-0.2251 (-0.93)	1.1942 *** (3.95)	-0.5016 (-1.17)	0.2401	CL - T

Panel C: Euro Zone Crisis - Small Cap

Stock Market	MRP	SMB	HML	Adjusted R2	Std. Errors
China	-0.0215 (-0.24)	-1.2170*** (-2.64)	-0.3953 (-1.00)	0.3438	CL - T
Hong Kong	-1.7355 ** (-2.10)	0.1430 (1.44)	-0.3291 ** (-2.27)	0.1816	CL - T
Taiwan	-4.2799 * (-1.75)	-0.5587*** (-2.84)	0.1297 (0.46)	(0.2950)	CL – T

Panel D: Euro Zone Crisis - Big Cap

Stock Market	MRP	SMB	HML	Adjusted R2	Std. Errors
China	-0.2103 (-0.41)	0.6102 *** (2.98)	0.6403 *** (4.34)	0.1933	CL - T
Hong Kong	-1.0171 (-1.06)	-0.0045 (-0.02)	0.3097 *** (3.43)	0.2005	CL - T
Taiwan	-3.3317 (-1.30)	0.5293 (0.89)	-0.2814 (-0.69)	0.1593	CL - T

Note: Values in the parentheses are the t-statistics. *, **, *** significant at 10%, 5%, 1% respectively.

Table 16 shows the regression results of monthly portfolio returns on market risk premium / excess market return (MRP), market capitalisation (SMB) and book-to-market (HML). Panel A and Panel B report the regression results of small market capitalisation and big market capitalisation portfolios during Global Financial Crisis. Panel C and Panel D report the regression results of small market capitalisation and big market capitalisation portfolios during Euro Zone Crisis. Coefficients (t-statistics) are presented from the OLS using monthly cross section time series data for China, Hong Kong and Taiwan stock markets during Global Financial Crisis and Euro Zone Crisis. OLS regressions are presented for each of the stock market, OLS regressions are presented for each of the stock market, where a separate regression is estimated for each of the small or big market capitalization portfolio. The standard errors are estimated in the presence of a fixed firm effect (CL-F), a time effect (CL-T) and a fixed firm and time effect (CL – F&T).

During the Global Financial Crisis, the HML factor is significant for the small market capitalisation portfolios of the China and Taiwan stock markets. As the HML factor has a positive coefficient in the China stock market, value effect is observed. Whereas, growth effect is observed in the Taiwan market as the coefficient is negative. During the Euro Zone Crisis, however, small market capitalisation portfolios of the Hong Kong stock market have a negative coefficient and therefore, growth effect is observed. Furthermore, big market capitalisation portfolios of the China and Hong Kong stock markets have value effect, as the coefficients are positive.

During the Global Financial Crisis, the adjusted R-squared for the small market capitalisation of the China, Hong Kong and Taiwan stock markets are 0.18, 0.09 and 0.41 respectively. Whereas, the adjusted R-squared for the big market capitalization are 0.00, 0.05 and 0.24. On the other hand, the adjusted R-squared for the small market capitalisation of the China, Hong Kong and Taiwan stock markets are 0.34, 0.180 and -0.30 respectively during Euro Zone Crisis. The adjusted R-squared for the big market capitalisation are 0.19, 0.20 and 0.16.

Integration

Table 17 reports the summary statistics for each of the factors. The summary statistics are monthly mean, standard deviation and t-mean (ratio of the mean to its standard error) statistics for each factor for Global Financial Crisis and Euro Zone Crisis respectively. Panel A and Panel B report the summary statistics of the China, Hong Kong and Taiwan stock market under the world model during the Global Financial Crisis and Euro Zone Crisis respectively.

Table 17 Fama and French - Three Factor Model - Integration
Summary Statistics - Averages, standard deviations and t-statistics for month returns - World Model

Panel A: Global Financial Crisis - World

	China / Hong Kong / Taiwan		
WRm- Rf	WSMB	WHMLW	
Mean	0.0525 ***	0.3908*	-0.0083
Std dev	0.0112	1.0466	0.2320
t-Statistic	(23.2)	(1.8)	(-0.1)

Panel B: Euro Zone Crisis - World

	China / Hong Kong / Taiwan		
	WRm- Rf	WSMB	WHML
Mean	0.0610 ***	0.0094	0.0068
Std dev	0.0130	0.0340	0.0295
t-Statistic	(23.2)	(1.3)	(1.1)

Table 17 reports the summary statistics for each of the factors. The summary statistics are monthly mean, standard deviation and t-mean (ratio of the mean to its standard error) statistics for each factor for Global Financial Crisis and Euro Zone Crisis respectively. Panel A and Panel B report the summary statistics of the China, Hong Kong and Taiwan stock market under the world model during the Global Financial Crisis and Euro Zone Crisis respectively. WRm- Rf (WMRP) is the market return in excess of the risk-free rate of the world model (Market Risk Premium), small minus big (WSMB) is the difference between the return on a portfolio of small market capitalisation stocks and the return on a portfolio of big market capitalisation stocks of the world model and high minus low (WHML) is the difference between the return on a portfolio of high book-to-market stocks and the return on a portfolio of low book-to-market stocks of the world model.

Table 18 reports the summary statistics for each of the factors. The summary statistics are monthly mean, standard deviation and t-mean (ratio of the mean to its standard error) statistics for each factor for Global Financial Crisis and Euro Zone Crisis respectively. Panel A and Panel B report the summary statistics of the China, Hong Kong and Taiwan stock market under the international model during the Global Financial Crisis and Euro Zone Crisis respectively.

Table 18 Fama and French - Three Factor Model - Integration
Summary Statistics - Averages, standard deviations and t-statistics for month returns - International Model

Panel A: Global Financial Crisis - International

China

	DRm- Rf	DSMB	DHML	FRm- Rf	FSMB	FHML
Mean	0.0247 ***	0.0061 **	0.0036	0.0267 ***	0.3861 *	-0.0117
Std dev	0.0069	0.0119	0.0187	0.0078	1.0452	0.2289
t-Stat	(17.8)	(2.5)	(0.9)	(17.1)	(1.8)	(-0.2)

Hong Kong

	DRm- Rf	DSMB	DHML	FRm- Rf	FSMB	FHML
Mean	0.0211 ***	0.3833 *	-0.0078	0.0319 ***	0.0092 ***	-0.0003
Std dev	0.0057	1.0471	0.2282	0.0084	0.0171	0.0228
t-Stat	(18.5)	(1.8)	(-0.1)	(18.9)	(2.6)	(0.0)

Taiwan

	DRm- Rf	DSMB	DHML	FRm- Rf	FSMB	FHML
Mean	0.0100	0.0025	-0.0033	0.0045 ***	0.3878 ***	-0.0053
Std dev	0.0000	0.0092	0.0135	0.0112	1.0476	0.2312
t-Stat	(0.0)	(1.3)	(-1.1)	(2.0)	(1.8)	(-0.1)

Panel B: Euro Zone Crisis - International

China

	DRm- Rf	DSMB	DHML	FRm- Rf	FSMB	FHML
Mean	0.0319 ***	-0.0013	0.0006	0.0274 ***	0.0113 **	0.0071
Std dev	0.0074	0.0323	0.0180	0.0062	0.0276	0.0230
t-Stat	(21.5)	(-0.1)	(0.1)	(22.0)	(2.0)	(1.5)

Hong Kong

	DRm- Rf	DSMB	DHML	FRm- Rf	FSMB	FHML
Mean	0.0219 ***	0.0103 *	0.0071	0.0390 ***	0.0000	-0.0003
Std dev	0.0059	0.0262	0.0226	0.0100	0.0315	0.0179
t-Stat	(18.5)	(1.9)	(1.5)	(19.5)	(0.0)	(0.0)

Taiwan

	DRm- Rf	DSMB	DHML	FRm- Rf	FSMB	FHML
Mean	0.0098 ***	0.0006	0.0003	0.0529 ***	0.0087	0.0065
Std dev	0.0018	0.0025	0.0031	0.0140	0.0325	0.0290
t-Stat	(27.2)	(1.1)	(0.4)	(18.8)	(1.3)	(1.1)

Table 18 reports the summary statistics for each of the factors. The summary statistics are monthly mean, standard deviation and t-mean (ratio of the mean to its standard error) statistics *for each factor for Global Financial Crisis and Euro Zone Crisis respectively. Panel A and Panel B report the summary statistics of the China, Hong Kong and Taiwan stock market under the international model during the Global Financial Crisis and Euro Zone Crisis respectively. DRm- Rf (DMRP) is the market return in excess of the risk-free rate of the domestics model (Market Risk Premium), small minus big (DSMB) is the difference between the return on a portfolio of small market capitalisation stocks and the return on a portfolio of big market capitalisation stocks of the domestics model and high minus low (DHML) is the difference between the return on a portfolio of high book-to-market stocks and the return on a portfolio of low book-to-market stocks of the domestics model. FRm- Rf (FMRP) is the market return in excess of the risk-free rate of the foreign element in the international model (Market Risk Premium), small minus big (FSMB) is the difference between the return on a portfolio of small market capitalisation stocks and the return on a portfolio of big market capitalisation stocks of the foreign element in the international model and high minus low (FHML) is the difference between the return on a portfolio of high book-to-market stocks and the return on a portfolio of low book-to-market stocks of the foreign element in the international model.*

Table 19 reports the summary statistics for each of the factors. The summary statistics are monthly mean, standard deviation and t-mean (ratio of the mean to its standard error) statistics for each factor for Global Financial Crisis and Euro Zone Crisis respectively. Panel A and Panel B report the summary statistics of the China, Hong Kong and Taiwan stock market under the domestic model during the Global Financial Crisis and Euro Zone Crisis respectively.

With the exception of the domestics and foreign market risk premium (FMRP) of the international model in the Taiwan stock market during the Global Financial Crisis, the market risk premium has shown significant t-statistics in the China, Hong Kong and Taiwan stock markets during the Global Financial Crisis and Euro Zone Crisis, under the three difference models – world, international (foreign market risk premium) and domestic. The FMRP is marginally significant under the international model of the Taiwan stock market.

During the Global Financial Crisis, the SMB factor is weakly significant under the world model. Under the domestic model, the factor is significant and weakly marginally significant in the China and Hong Kong stock markets. As for the international mode, the foreign small minus big (FSMB) is significant in the Hong Kong market. However, the factor is weakly significant in the China and Taiwan stock markets. The HML factor does not exhibit any form of significance under the three models.

Table 19 Fama and French - Three Factor Model - Integration
Summary Statistics - Averages, standard deviations and t-statistics for month returns - Domestic Model

Panel A:	Global Financial Crisis - Domestics		
China			
	DRm- Rf	DSMB	DHML
Mean	0.0247 ***	0.0061 **	0.0036
Std dev	0.0069	0.0119	0.0187
t-Statistic	(17.8)	(2.5)	(0.9)
	Hong Kong		
DRm- Rf	DSMB	DHML	
Mean	0.0211 ***	0.3833 *	-0.0078
Std dev	0.0057	1.0471	0.2282
t-Statistic	(18.5)	(1.8)	(-0.1)
	Taiwan		
DRm- Rf	DSMB	DHML	
Mean	0.0100	0.0025	-0.0033
Std dev	0.0000	0.0092	0.0135
t-Statistic	(0.0)	(1.3)	(-1.1)

Panel B:	Euro Zone Crisis - Domestics		
China			
	DRm- Rf	DSMB	DHML
Mean	0.0319 ***	-0.0013	0.0006
Std dev	0.0074	0.0323	0.0180
t-Statistic	(21.5)	(-0.1)	(0.1)
Hong Kong			
	DRm- Rf	DSMB	DHML
Mean	0.0219 ***	0.0103 *	0.0071
Std dev	0.0059	0.0262	0.0226
t-Statistic	(18.5)	(1.9)	(1.5)
	Taiwan		
	DRm- Rf	DSMB	DHML
Mean	0.0098 ***	0.0006	0.0003
Std dev	0.0018	0.0025	0.0031
t-Statistic	(27.2)	(1.1)	(0.4)

Table 19 reports the summary statistics for each of the factors. The summary statistics are monthly mean, standard deviation and t-mean (ratio of the mean to its standard error) statistics for each factor for Global Financial Crisis and Euro Zone Crisis respectively. Panel A and Panel B report the summary statistics of the China, Hong Kong and Taiwan stock market under the *domestic model during the Global Financial Crisis and Euro Zone Crisis respectively. DRm- Rf (DMRP) is the market return in excess of the risk-free rate of the domestics model (Market Risk Premium), small minus big (DSMB) is the difference between the return on a portfolio of small market capitalisation stocks and the return on a portfolio of big market capitalisation stocks of the domestics model and high minus low (DHML) is the difference between the return on a portfolio of high book-to-market stocks and the return on a portfolio of low book-to-market stocks of the domestics model.*

During the Euzo Zone Crisis, the foreign small minus big factor (FSMB) under the international model is marginally significant in the China stock market. The SMB factor is also weakly significant in the Hong Kong stock market under the domestic model. Similar to the Global Financial Crisis, the HML factor does not exhibit any form of significance under the three models during the Euro Zone Crisis.

Table 20 shows the regression results of monthly portfolio returns on market risk premium / excess market return (MRP), market capitalisation (SMB) and book-to-market (HML), under three models which examine the effect of integration – world, international and domestics. Panel A, Panel B and Panel C report the regression results of 25 portfolios of the China, Hong Kong and Taiwan stock markets during Global Financial Crisis. Panel D, Panel E and Panel F report the regression results of 25 portfolios of the China, Hong Kong and Taiwan stock markets during Euro Zone Crisis. The standard errors are estimated in the presence of a fixed firm effect (CL-F), a time effect (CL-T) and a fixed firm and time effect (CL – F&T).For full results, please see Appendix C.

Table20 Regression Results of Monthly Portfolio Returns on Market Risk Premium / Excess Market Return (MRP), Market Capitalisation (SMB) and Book-to-Market (HML) – Market Integration

Panel – OLS (Estimating Standard Errors in the Presence of a Fixed Firm and/or Time Effect)

Panel A: Global Financial Crisis - China

	WMRP	WSMB		WHML		Adjusted R-Squared	Standard Errors
World	0.0115	0.0150		0.0218		0.0135	CL - T
	(0.01)	(1.42)		(0.39)			
	DMRP	DSMB		DHML			
Intl.	5.2154	-3.9835	**	-0.2116			
	(1.42)	(-2.01)		(-0.17)			
	FMRP	FSMB		FHML		Adjusted R-Squared	Standard Errors
	-4.9418	0.0046		0.0259		0.1988	CL - T
	(-1.29)	(0.29)		(0.33)			
	DMRP	DSMB		DHML		Adjusted R-Squared	Standard Errors
Domes.	2.0143	-4.0009	*	0.1381		0.1428	CL - T
	(0.64)	(-1.79)		(0.11)			

Panel B: Global Financial Crisis - Hong Kong

	WMRP	WSMB		WHML		Adjusted R-Squared	Standard Errors
World	-	0.0117	***	-0.2251	***	0.5743	CL - F & T
		(3.04)		(-9.42)			
	DMRP	DSMB		DHML			
Intl.	-	0.0083	***	-0.2279	***		
		(2.55)		(-7.94)			
	FMRP	FSMB		FHML		Adjusted R-Squared	Standard Errors
	-	-		-		0.5728	CL - F & T
	DMRP	DSMB		DHML		Adjusted R-Squared	Standard Errors
Domes.	-	0.0083	**	-0.2279	***	0.5743	CL - F & T
		(2.13)		(-9.41)			

Panel C: Global Financial Crisis - Taiwan

	WMRP		WSMB		WHML		Adjusted	Standard
							R-Squared	Errors
World	-2.1837		0.0199	**	-0.0126		0.0170	CL - T
	(-0.98)		(1.97)		(-0.32)			
	DMRP		DSMB		DHML			
Intl.	-		-3.0877		-6.0683	**		
			(-0.69)		(-2.00)			
	FMRP		FSMB		FHML		Adjusted	Standard
							R-Squared	Errors
	-3.6548	*	0.0180		0.0210		0.0674	CL - T
	(-1.68)		(1.63)		(0.41)			
DMRP	DSMB		DHML		Adjusted		Standard	
							R-Squared	Errors
Domes.	-		-3.3326		-5.0422		0.0341	CL - T
			(-0.69)		(-1.61)			

Panel D: Euro Zone Crisis - China

	WMRP		WSMB		WHML		Adjusted	Standard
							R-Squared	Errors
World	25.1392	***	0.7750		0.7628		0.3924	CL - T
	(7.38)		(0.61)		(0.38)			
	DMRP		DSMB		DHML			
Intl.	9.9780		-0.1565		1.8859			
	(0.79)		(-0.09)		(0.49)			
	FMRP		FSMB		FHML		Adjusted	Standard
							R-Squared	Errors
39.9349 **	1.3230		1.9625		0.3025		CL - T	
	(2.09)		(0.56)		(0.63)			
	DMRP		DSMB		DHML		Adjusted	Standard
							R-Squared	Errors
Domes.	30.3165	***	0.8740		1.6714		0.1952	CL - T
	(3.64)		(0.68)		(0.35)			

Panel E: Euro Zone Crisis - Hong Kong

	WMRP		WSMB	WHML		Adjusted R-Squared	Standard Errors
World	-0.7433		-0.3200	0.4225		0.0112	CL - T
	(-0.81)		(-0.70)	(1.01)			
	DMRP		DSMB	DHML			
Intl.	3.1236		0.6510	-0.6006			
	(0.92)		(0.85)	(-0.91)			
	FMRP		FSMB	FHML		Adjusted R-Squared	Standard Errors
	-3.7272	*	-0.1632	1.3772	***	0.0595	CL - T
	(-1.95)		(-0.33)	(2.66)			
	DMRP		DSMB	DHML		Adjusted R-Squared	Standard Errors
Domes.	-0.8421		0.6580	-0.4746		0.0105	CL - T
	(-0.38)		(1.07)	(-0.73)			

Panel F: Euro Zone Crisis - Taiwan

	WMRP		WSMB		WHML		Adjusted R-Squared	Standard Errors
World	-0.7925		-0.3810		0.8387	**	0.1024	CL - T
	(-0.77)		(-0.80)		(2.13)			
	DMRP		DSMB		DHML			
Intl.	7.3351**		7.9134***		-2.3542			
	(2.18)		(2.80)		(-1.50)			
	FMRP		FSMB		FHML		Adjusted R-Squared	Standard Errors
	-0.7912		-0.3600		0.7313**		0.2129	CL - T
	'(-0.82)		(-0.76)		(1.96)			
	DMRP		DSMB		DHML		Adjusted R-Squared	Standard Errors
Domes.	5.4733	***	10.8068	***	-4.2511	***	0.1515	CL – T
(3.92)	(6.48)		(-3.72)					

Notes: Values in the parentheses are the t-statistics. *, **, *** significant at 10%, 5%, 1% respectively

Table 20 shows the regression results of monthly portfolio returns on market risk premium (MRP), market capitalisation (SMB) and book-to-market (HML), under three models which examine the effect of integration – world, international and domestics. Panel A, Panel B and Panel C report the regression results of 25 portfolios of the China, Hong Kong and Taiwan stock markets during Global Financial Crisis. Panel D, Panel E and Panel F report the regression results of 25 portfolios of the China, Hong Kong and

Taiwan stock markets during Euro Zone Crisis. Coefficients (t-statistics) are presented from the OLS with using monthly cross section time series data for China, Hong Kong and Taiwan stock markets during Global Financial Crisis and Euro Zone Crisis. OLS regressions are presented for each of the stock market, where a separate regression is estimated for each of the model. The standard errors are estimated in the presence of a fixed firm effect (CL-F), a time effect (CL-T) and a fixed firm and time effect (CL – F&T).

Global Financial Crisis

During the Global Financial Crisis, further investigation reveals domestic SMB factor of the international and domestic models of the China stock market are marginally and weakly significant. As the coefficients are negative, the size effect is observed in the domestic SMB.

The adjusted R-squared of the world, international and domestic models are 0.01, 0.20 and 0.14 respectively.

In Hong Kong, the WSMB factor has positive significant coefficient under the world model. In addition, the domestic SMB (DSMB) factor of the international and domestic models are also positively significant.

Furthermore, the WHML factor has negative significant coefficient under the world model. The domestic HML (DHML) factor of the international and domestic are also negatively significant.

The adjusted R-squared of the world, international and domestic models are 0.57, 0.57 and 0.57 respectively.

In Taiwan, the foreign market risk premium factor (FMRP) has a weakly significant negative coefficient under the international model. In addition, the SMB factor is marginally significant under the world model. Thirdly, the domestic HML (DHML) factor is significant under the international model. As the coefficient is negative, growth effect is observed.

The adjusted R-squared of the world, international and domestic models are 0.01, 0.07 and 0.03 respectively.

Euro Zone Crisis

The market risk premium has shown significant positive coefficient in the China stock market under the world (WMRP) and domestic (DMRP) models. Under the international model, the foreign market risk premium factor (FMRP) is marginally significant.

The adjusted R-squared of the world, international and domestic models are 0.39, 0.30 and 0.20 respectively.

In Hong Kong, the foreign market risk premium factor (FMRP) has a weakly significant negative coefficient under the international model. The foreign HML factor (FHML) is positively significant under the international model.

The adjusted R-squared of the world, international and domestic models are 0.01, 0.06 and 0.01 respectively.

In Taiwan, the market risk premium, SMB factor and HML factor have significant positive coefficients under the domestic model. Furthermore, the domestic HML (DMHL) has shown growth effect, as the coefficient is negative. The HML factor is positively significant under the world model.

Furthermore, under the international model of the Taiwan stock market, the domestic market risk premium (DMRP), domestic SMB factor (DSMB) and foreign HML factor (FHML) are marginally significant, significant and marginally significant respectively.

The adjusted R-squared of the world, international and domestic models are 0.10, 0.21 and 0.15 respectively.

5.4.3 Fama and French Five Factor Model (2015)

Overall Firm

Table 21 Fama and French - Five Factor Model
Summary Statistics - Averages, standard deviations and t-statistics for month returns

Panel A: Global Financial Crisis

	China					Hong Kong				
	Rm- Rf	SMB	HML	RMW	CMA	Rm- Rf	SMB	HML	RMW	CMA
Mean	0.0467***	0.0111**	0.0058	0.0200**	0.0222***	0.0556***	1.0528*	-0.0267	-0.0161	0.0081
Std dev	0.0138	0.0247	0.0348	0.0395	0.0379	0.0164	2.8525	0.6192	0.0661	0.1562
t-Stat	(17.6)	(2.2)	(0.8)	(2.5)	(2.9)	(16.7)	(1.8)	(-0.2)	(-1.2)	(0.2)

Taiwan					
	Rm- Rf	SMB	HML	RMW	CMA
Mean	0.0633***	0.0264	-0.0381	0.0167**	-0.0033
Std dev	0.0091	0.0862	0.1234	0.0352	0.1448
t-Stat	(34.7)	(1.5)	(-1.5)	(2.3)	(-0.1)

Panel B: Euro Zone Crisis

	China					Hong Kong				
	Rm- Rf	SMB	HML	RMW	CMA	Rm- Rf	SMB	HML	RMW	CMA
Mean	0.0613***	-0.0010	0.0003	0.0145***	0.0071	0.0584***	0.0294*	0.0190	-0.0165	-0.0106
Std dev	0.0162	0.0585	0.0325	0.0186	0.0831	0.0144	0.0744	0.0614	0.0732	0.0501
t-Stat	(18.9)	(0.0)	(0.0)	(3.8)	(0.4)	(20.2)	(1.9)	(1.5)	(-1.0)	(-0.9)

			Taiwan		
	Rm- Rf	SMB	HML	RMW	CMA
Mean	0.0677***	0.0087*	0.0010	0.0229***	0.0168***
Std dev	0.0066	0.0249	0.0324	0.0241	0.0319
t-Stat	(51.2)	(1.7)	(0.1)	(4.7)	(2.6)

Table 21 reports the summary statistics for each of the factors. Panel A and Panel B show monthly mean, standard deviation and t-mean (ratio of the mean to its standard error) statistics for each factor for Global Financial Crisis and Euro Zone Crisis respectively. Rm- Rf (MRP) is the market return in excess of the risk-free rate (Market Risk Premium), small minus big (SMB) is the difference between the return on a portfolio of small market capitalization stocks and the return on a portfolio of big market capitalization stocks, high minus low (HML) is the difference between the return on a portfolio of high book-to-market stocks and the return on a portfolio of low book-to-market stocks, robust minus weak (RMW) is the difference between the returns on diversified portfolios of stocks with robust and weak profitability and conservative minus aggressive (CMA) is the difference between the returns on diversified portfolios of low and high investment firms.

Table 21 reports the summary statistics for each of the factors. Panel A and Panel B show monthly mean, standard deviation and t-mean (ratio of the mean to its standard error) statistics for each factor for Global Financial Crisis and Euro Zone Crisis respectively

The market risk premium / excess market return has shown significant t-statistics for China, Hong Kong and Taiwan stock markets during the Global Financial Crisis and Euro Zone Crisis. In addition, the SMB factor is weakly significant in Hong Kong stock market during the Global Financial Crisis and Euro Zone Crisis. The profitability factor exhibit significant t-statistics in the China and Taiwan stock markets during the Euro Zone Crisis. During the Global Financial Crisis, the profitability factor is marginally significant in the China and Taiwan stock markets.

Table 22 shows the regression results of monthly portfolio returns on market risk premium / excess market return (MRP), market capitalization (SMB), book-to-market (HML), profitability factor (RMW) and investment factor (CMA). Coefficients (t-statisctics) are presented from the OLS using monthly cross section time series data for China, Hong Kong and Taiwan stock markets during Global Financial Crisis and Euro Zone Crisis. OLS regressions are presented for each of the stock market, where a separate regression is estimated for each of them. The standard errors are estimated in the presence of a fixed firm effect (CL-F), a time effect (CL-T) and a fixed firm and time effect (CL – F&T).For full results, please see Appendix D.

The market risk premium factor / excess market return exhibits significant negative coefficients for the Taiwan stock markets during the Global Financial Crisis and Euro Zone Crisis. In addition, the coefficient of the market risk premium of the China stock market during the Euro Zone Crisis is positive.

The SMB factor is significant and marginally significant respectively for the China and Hong Kong stock markets during Global Financial Crisis. However, the size effect can only be observed in China, as the coefficient is negative.

The HML factor is significant and weakly significant in the Hong Kong and Taiwan stock markets respectively during the Global Financial Crisis. Growth effect is observed in both the markets as the coefficient is negative.

Table 22
Regression Results of Monthly Portfolio Returns on Market Risk Premium / Excess Market Return (MRP), Market Capitalisation (SMB), Book-to-Market (HML), Profitability Factor (RMW) and (CMA) Investment Factor

Panel – OLS (Estimating Standard Errors in the Presence of a Fixed Firm and/or Time Effect

Panel A: Global Financial Crisis

Stock Market	MRP	SMB	HML	RMW	CMA	Adjusted R2	Std. Errors
China	-1.0964 (-0.74)	-2.2699 ** (-2.07)	-0.0165 (-0.02)	0.88 (0.74)	-1.1933 (-0.83)	0.1546	CL-T
Hong Kong	-	0.0028 ** (2.36)	-0.0829 *** (-7.93)	-	-	0.5733	CL – F & T
Taiwan	-4.1643*** (-2.59)	-0.8928 (-1.60)	-0.6704 * (-1.72)	-1.1055 * (-1.67)	-0.1713 (-0.42)	0.1072	CL-T

Panel B: Euro Zone Crisis

Stock Market	MRP	SMB	HML	RMW	CMA	Adjusted R2	Std. Errors
China	19.4718*** (5.43)	0.5967 (0.57)	-0.4040 (-0.13)	-0.5696 (-0.45)	1.6675 (0.35)	0.3610	CL-T
Hong Kong	-0.7528 (-0.72)	0.0024 (0.01)	-0.1919 (-0.89)	-0.4514 (-1.46)	-0.2059 (-1.26)	0.0546	CL-T
Taiwan	-4.8333** (-2.14)	-0.7761 (-1.32)	-0.0125 (-0.03)	0.1168 (0.12)	-0.5041 (-0.38)	0.1925	CL-T

Note: Values in the parentheses are the t-statistics. *, **, *** significant at 10%, 5%, 1% respectively.

Table 22 shows the regression results of monthly portfolio returns on market risk premium / excess market return (MRP), market capitalization (SMB), book-to-market (HML), profitability factor (RMW) and investment factor (CMA). Coefficients (t-statistics) are presented from the OLS using monthly cross section time series data for China, Hong Kong and Taiwan stock markets during Global Financial Crisis and Euro Zone Crisis. OLS regressions are presented for each of the stock market, where a separate regression is estimated for each of them. The standard errors are estimated in the presence of a fixed firm effect (CL-F), a time effect (CL-T) and a fixed firm and time effect (CL – F&T).

Neither the profitability factor (RMW) nor the investment factor (CMA) is significant for the three stock markets during the Global Financial Crisis and Euro Zone Crisis.

The adjusted R-squared for the China, Hong Kong and Taiwan stock markets are 0.15, 0.57 and 0.11 respectively during the Global Financial Crisis. During the Euro Zone Crisis, the R-squared changes to 0.36, 0.05 and 0.19 respectively

Market Capitalisation

Table 23 reports the summary statistics for each of the factors. The summary statistics are monthly mean, standard deviation and t-mean (ratio of the mean to its standard error) statistics for each factor for Global Financial Crisis and Euro Zone Crisis respectively. Panel A and Panel B report the summary statistics of small market capitalization and big market capitalization portfolios during Global Financial Crisis. Panel C and Panel D report the summary statistics of small market capitalization and big market capitalization portfolios during Euro Zone Crisis.

Only the market risk premium / excess market return has shown significant t-statistics for small and big capitalization portfolios of China, Hong Kong and Taiwan stock markets during the Global Financial Crisis and Euro Zone Crisis.

Table 23 Fama and French –Five Factor Model – Market Capitalisation
Summary Statistics – Averages, standard deviations and t-statistics for month returns

Panel A: Global Financial Crisis - Small Cap

	China					Hong Kong				
	Rm- Rf	SMB	HML	RMW	CMA	Rm- Rf	SMB	HML	RMW	CMA
Mean	0.0467***	0.0144	0.0339	0.0422	0.0514	0.0556***	0.0636	-0.0872	-0.0222	0.0719
Std dev	0.0138	0.0497	0.1025	0.1172	0.0900	0.0165	0.1156	0.1205	0.0782	0.1003
t-Stat	(7.5)	(0.6)	(0.7)	(0.8)	(1.2)	(7.5)	(1.2)	(-1.6)	(-0.6)	(1.6)

Taiwan					
Rm- Rf	SMB	HML	RMW	CMA	
Mean	0.0507***	0.0864	-0.0922	0.0186	0.0289
Std dev	0.0267	0.3831	0.3772	0.0503	0.0455
t-Stat	(4.2)	(0.5)	(-0.5)	(0.8)	(1.4)

Panel B: Global Financial Crisis - Big Cap

	China					Hong Kong				
	Rm- Rf	SMB	HML	RMW	CMA	Rm- Rf	SMB	HML	RMW	CMA
Mean	0.0467***	0.0139	-0.0031	0.0119	0.0117	0.0556***	0.0047	-0.0231	0.0039	0.0300
Std dev	0.0138	0.0449	0.0453	0.0590	0.0626	0.0165	0.1339	0.0720	0.0709	0.1401
t-Stat	(7.5)	(0.6)	(-0.1)	(0.4)	(0.4)	(7.5)	(0.0)	(-0.7)	(0.1)	(0.4)

	Taiwan				
	Rm- Rf	SMB	HML	RMW	CMA
Mean	0.0507***	-0.0022	-0.0158	0.0150	0.0253
Std dev	0.0267	0.0492	0.0387	0.0579	0.0508
t-Stat	(4.2)	(0.0)	(-0.8)	(0.5)	(1.1)

Panel C: Euro Zone Crisis - Small Cap

	China					Hong Kong				
	Rm- Rf	SMB	HML	RMW	CMA	Rm- Rf	SMB	HML	RMW	CMA
Mean	0.0600***	0.0106	0.0035	0.0142	0.0216	0.0584***	0.0548	-0.0506	-0.0219	0.0558
Std dev	0.0160	0.0298	0.0372	0.0303	0.0280	0.0144	0.1526	0.0741	0.0790	0.1614
t-Stat	(8.3)	(0.7)	(0.2)	(1.0)	(1.7)	(9.0)	(0.8)	(-1.5)	(-0.5)	(0.7)

Taiwan					
Rm- Rf	SMB	HML	RMW	CMA	
Mean	0.0677***	0.0197	0.0023	-0.0145	-0.0152
Std dev	0.0066	0.0560	0.0452	0.0346	0.0437
t-Stat	(22.9)	(0.7)	(0.1)	(-0.9)	(-0.7)

Panel D: Euro Zone Crisis - Big Cap

	China					Hong Kong				
	Rm- Rf	SMB	HML	RMW	CMA	Rm- Rf	SMB	HML	RMW	CMA
Mean	0.0600***	0.0071	-0.0090	0.0087	0.0116	0.0584***	0.0213	0.0097	0.0103	-0.0058
Std dev	0.0160	0.0453	0.0515	0.0516	0.0388	0.0144	0.0782	0.1367	0.0402	0.1611
t-Stat	(8.3)	(0.3)	(-0.3)	(0.3)	(0.6)	(9.0)	(0.6)	(0.1)	(0.5)	(0.0)

	Taiwan				
	Rm- Rf	SMB	HML	RMW	CMA
Mean	0.0677***	-0.0032	-0.0003	0.0016	0.0003
Std dev	0.0066	0.0258	0.0341	0.0375	0.0290
t-Stat	(22.9)	(-0.2)	(0.0)	(0.0)	(0.0)

Table 23 reports the summary statistics for each of the factors. The summary statistics are monthly mean, standard deviation and t-mean (ratio of the mean to its standard error) statistics for each factor for Global Financial Crisis and Euro Zone Crisis respectively. Panel A and Panel B report the summary statistics of small market capitalisation and big market capitalisation portfolios during Global Financial Crisis. Panel C and Panel D report the summary statistics of small market capitalisation and big market capitalisation portfolios during Euro Zone Crisis. Rm- - Rf (MRP) is the market return in excess of the risk-free rate (Market Risk Premium), small minus big (SMB) is the difference between the return on a portfolio of small market capitalisation stocks and the return on a portfolio of big market capitalisation stock, high minus low (HML) is the difference between the return on a portfolio of high book-to-market stocks and the return on a portfolio of low book-to-market stocks , robust minus weak (RMW) is the difference between the returns on diversified portfolios of stocks with robust and weak profitability and conservative minus aggressive (CMA) is the difference between the returns on diversified portfolios of low and high investment firms.

Table 24 shows the regression results of monthly portfolio returns on market risk premium / excess market return (MRP), market capitalisation (SMB), book-to-market (HML), profitability factor (RMW) and investment factor (CMA). Panel A and Panel B report the regression results of small market capitalisation and big market capitalisation portfolios during Global Financial Crisis. Panel C and Panel D report the regression results of small market capitalisation and big market capitalisation portfolios during Euro Zone Crisis. The standard errors are estimated in the presence of a fixed firm effect (CL-F), a time effect (CL-T) and a fixed firm and time effect (CL – F&T).For full results, please see Appendix D

The market risk premium / excess market return factor exhibits significant t-statistics for big market capitalisation portfolios of the Hong Kong stock markets during the Global Financial Crisis. The significant coefficient of the market risk premium is negative. During the Euro Zone Crisis, the small market capitalisation portfolio of the Hong Kong stock market exhibit marginally significant negative coefficients. In addition, the small and big market capitalisation portfolios of the Taiwan stock market show significant and marginally significant negative coefficients respectively during the Euro Zone Crisis.

Table 24
Regression Results of Monthly Portfolio Returns on Market Risk Premium / Excess market return (MRP), Market Capitalisation (SMB),Book-to-Market (HML), Profitability Factor (RMW) and Investment Factor (CMA) – Market Capitalisation
Panel – OLS (Estimating Standard Errors in the Presence of a Fixed Firm and/or Time Effect

Panel A: Global Financial Crisis - Small Cap

Stock Market	MRP	SMB	HML	RMW	CMA	Adjusted R2	Std. Errors
China	-0.6636 (-0.43)	-0.9115 ** (-2.13)	-0.2143 (-0.44)	0.0195 (0.04)	0.5363 (1.38)	0.2118	CL-T
Hong Kong	-1.6899 (-1.60)	0.1989 (0.67)	0.0957 (0.37)	0.1208 (0.58)	-0.6433* (-1.75)	0.2218	CL-T
Taiwan	0.4695 (1.31)	0.2724 (1.20)	-	-	-	0.4055	CL - F & T

Panel B: Global Financial Crisis - Big Cap

Stock Market	MRP	SMB	HML	RMW	CMA	Adjusted R2	Std. Errors
China	-0.5190 (-0.33)	0.5514 (0.83)	-0.0944 (-0.14)	0.0495 (0.27)	0.4930* (1.70)	0.0327	CL-T
Hong Kong	-2.1308*** (-2.63)	-0.2763 (-0.89)	0.1321 (0.53)	0.0474 (0.16)	-1.4235*** (-5.55)	0.4484	CL-T
Taiwan	-0.1410 (-0.86)	0.8646 (1.39)	-0.2567 (-0.65)	2.169 *** (6.92)	-2.1816*** (-4.05)	0.5019	CL-T

Panel C: Euro Zone Crisis - Small Cap

Stock Market	MRP	SMB	HML	RMW	CMA	Adjusted R2	Std. Errors
China	0.1267	-1.4897 ***	-0.4744 *	0.5883 *	-1.0545***	0.5533	CL-T
	(0.25)	(-4.70)	(-1.93)	(1.69)	(-4.82)		
Hong Kong	-1.7853**	0.1123	-0.3441 **	0.1363	0.2012	0.2348	CL-T
	(-2.22)	(1.04)	(-2.56)	(1.64)	(1.08)		
Taiwan	-4.0573**	-0.5832 **	0.0967	1.1791 ***	-1.5247***	0.4468	CL-T
	(-2.22)	(-2.37)	(0.44)	(3.27)	(-3.14)		

Panel D: Euro Zone Crisis - Big Cap

Stock Market	MRP	SMB	HML	RMW	CMA	Adjusted R2	Std. Errors
China	-0.1744	0.921 **	0.6158 ***	0.3341	0.1539	0.2069	CL-T
	(-0.33)	(2.07)	(3.73)	(0.45)	(0.42)		
Hong Kong	-0.9372	-0.0097	0.3253	0.0244	-0.1082	0.1911	CL-T
	(-0.84)	(-0.02)	(1.22)	(0.07)	(-0.25)		
Taiwan	-4.0112 **	0.6425	-0.3217	-2.2734 ***	3.0850***	0.5176	CL-T
	(-2.33)	(1.36)	(-1.18)	(-4.96)	(4.63)		

Notes: Values in the parentheses are the t-statistics. *, **, *** significant at 10%, 5%, 1% respectively

Table 24 shows the regression results of monthly portfolio returns on market risk premium / excess market return (MRP), market capitalisation (SMB), book-to-market (HML), profitability factor (RMW) and investment factor (CMA). Panel A and Panel B report the regression results of small market capitalisation and big market capitalisation portfolios during Global Financial Crisis. Panel C and Panel D report the regression results of small market capitalisation and big market capitalisation portfolios during Euro Zone Crisis. Coefficients (t-statistics) are presented from the OLS using monthly cross section time series data for China, Hong Kong and Taiwan stock markets during Global Financial Crisis and Euro Zone Crisis. OLS regressions are presented for each of the stock market, where a separate regression is estimated for each of the small or big market capitalisation portfolio. The standard errors are estimated in the presence of a fixed firm effect (CL-F), a time effect (CL-T) and a fixed firm and time effect (CL – F&T).

The SMB factor is marginally significant and significant for the small capitalisation portfolios of the China stock market respectively during Global Financial Crisis and Euro Zone Crisis. As the coefficients are negative, size effect is observed. The SMB factor is also significant for the small capitalisation portfolios of the Taiwan stock markets and marginally significant for the big capitalisation portfolios of the China stock markets during Euro Zone Crisis. Size effect is observed for the small capitalisation portfolios of the Taiwan stock markets as the coefficient is negative.

During the Global Financial Crisis, the HML factor is insignificant for both the small and big market capitalisation portfolios of the three stock markets. During the Euro Zone Crisis, the HML factor is weakly and marginally significant for the small market capitalisation portfolios of the China and Hong Kong stock markets. As the coefficients are negative, growth effect is observed. Furthermore, the HML factor exhibit significant positive coefficient for the big market capitalization portfolio.

The profitability factor is significant in the big market capitalisation portfolios of the Taiwan stock markets during the Global Financial Crisis. On the other hand, the factor is weakly significant and significant in the small market capitalisation portfolios of the China and Taiwan stock markets respectively during the Euro Zone Crisis.

During the Global Financial Crisis, the investment factor is significant in the big market capitalization portfolios of the Hong Kong and Taiwan stock markets. On the other hand, the investment factor is significant in the small market capitalisation portfolios of the China and Taiwan stock markets during the Euro Zone Crisis.

During the Global Financial Crisis, the adjusted R-squared for the small market capitalisation of the China, Hong Kong and Taiwan stock markets are 0.21, 0.22 and 0.41 respectively. Whereas, the adjusted R-squared for the big market capitalization are 0.03, 0.45 and 0.50. On the other hand, the adjusted R-squared for the small market capitalisation of the China, Hong Kong and Taiwan stock markets are 0.55, 0.23 and 0.45 respectively during Euro Zone Crisis. The adjusted R-squared for the big market capitalisation are 0.20, 0.19 and 0.52.

Integration

Table 25 reports the summary statistics for each of the factors. The summary statistics are monthly mean, standard deviation and t-mean (ratio of the mean to its standard error) statistics for each factor for Global Financial Crisis and Euro Zone Crisis respectively. Panel A and Panel B report the summary statistics of the China, Hong Kong and Taiwan stock market under the world model during the Global Financial Crisis and Euro Zone Crisis respectively.

Table 25 Fama and French - Five Factor Model - Integration
Summary Statistics - Averages, standard deviations and t-statistics for month returns – World Model

Panel A: Global Financial Crisis - World

China/ Hong Kong / Taiwan

	WRm- Rf	WSMB	WHML	WRMW	WCMA
Mean	0.0525 ***	0.3908 *	-0.0083	0.0064	0.0144
Std dev	0.0112	1.0466	0.2320	0.0338	0.0640
t-Statistic	(23.2)	(1.8)	(-0.1)	(0.9)	(1.1)

Panel B: Euro Zone Crisis - World

China/Hong Kong / Taiwan

	WRm- Rf	WSMB	WHML	WRMW	WCMA
Mean	0.0610 ***	0.0094	0.0068	0.0023	0.0035
Std dev	0.0130	0.0340	0.0295	0.0555	0.0252
t-Statistic	(23.2)	(1.3)	(1.1)	(0.2)	(0.6)

Table 25 reports the summary statistics for each of the factors. The summary statistics are monthly mean, standard deviation and t-mean (ratio of the mean to its standard error) statistics for each factor for Global Financial Crisis and Euro Zone Crisis respectively. Panel A and Panel B report the summary statistics of the China, Hong Kong and Taiwan stock market under the world model during the Global Financial Crisis and Euro Zone Crisis respectively. WRm- Rf (WMRP) is the market return in excess of the risk-free rate of the world model (Market Risk Premium), small minus big (WSMB) is the difference between the return on a portfolio of small market capitalisation stocks and the return on a portfolio of big market capitalisation stocks of the world model and high minus low (WHML) is the difference between the return on a portfolio of high book-to-market stocks and the return on a portfolio of low book-to-market stocks of the world model, robust minus weak (WRMW) is the difference between the returns on diversified portfolios of stocks with robust and weak profitability of the world model and conservative minus aggressive (WCMA) is the difference between the returns on diversified portfolios of low and high investment firms of the world model.

Table 26 reports the summary statistics for each of the factors. The summary statistics are monthly mean, standard deviation and t-mean (ratio of the mean to its standard error) statistics for each factor for Global Financial Crisis and Euro Zone Crisis respectively. Panel A and Panel B report the summary statistics of the China, Hong Kong and Taiwan stock market under the international model during the Global Financial Crisis and Euro Zone Crisis respectively.

Table 26 Fama and French - Five Factor Model - Integration
Summary Statistics - Averages, standard deviations and t-statistics for month returns- International Model

Panel A: Global Financial Crisis - International

China

	DRm- Rf	DSMB	DHML	DRMW	DCMA	FRm- Rf	FSMB	FHML	FRMW	FCMA
Mean	0.0247 ***	0.0061**	0.0036	0.0106**	0.0117***	0.0267***	0.3861*	-0.0117	-0.0044	0.0036
Std dev	0.0069	0.0119	0.0187	0.0216	0.0212	0.0078	1.0452	0.2289	0.0246	0.0612
t-Statistic	(17.8)	(2.5)	(0.9)	(2.4)	(2.7)	(17.1)	(1.8)	(-0.2)	(-0.8)	(0.2)

Hong Kong

	DRm- Rf	DSMB	DHML	DRMW	DCMA	FRm- Rf	FSMB	FHML	FRMW	FCMA
Mean	0.0211***	0.3833*	-0.0078	-0.0053	0.0025	0.0319***	0.0092***	-0.0003	0.0122***	0.0103**
Std dev	0.0057	1.0471	0.2282	0.0236	0.0571	0.0084	0.0171	0.0228	0.0221	0.0226
t-Statistic	(18.5)	(1.8)	(-0.1)	(-1.0)	(0.2)	(18.9)	(2.6)	(0.0)	(2.7)	(2.2)

Taiwan

	DRm- Rf	DSMB	DHML	DRMW	DCMA	FRm- Rf	FSMB	FHML	FRMW	FCMA
Mean	0.0100	0.0025	-0.0033	0.0019***	-0.0008	0.0045**	0.3878*	-0.0053	0.0044	0.0156
Std dev	0.0000	0.0092	0.0135	0.0040	0.0156	0.0112	1.0476	0.2312	0.0336	0.0615
t-Statistic	(0.0)	(1.3)	(-1.1)	(2.3)	(0.0)	(2.0)	(1.8)	(-0.1)	(0.6)	(1.2)

Panel B: Euro Zone Crisis - International

China

	DRm- Rf	DSMB	DHML	DRMW	DCMA	FRm- Rf	FSMB	FHML	FRMW	FCMA
Mean	0.0319***	-0.0013	0.0006	0.0048	0.0071***	0.0274***	0.0113**	0.0071	-0.0016	-0.0045
Std dev	0.0074	0.0323	0.0180	0.0440	0.0108	0.0062	0.0276	0.0230	0.0187	0.0268
t-Statistic	(21.5)	(-0.1)	(0.1)	(0.5)	(3.2)	(22.0)	(2.0)	(1.5)	(-0.2)	(-0.7)

Hong Kong

	DRm- Rf	DSMB	DHML	DRMW	DCMA	FRm- Rf	FSMB	FHML	FRMW	FCMA
Mean	0.0219***	0.0103*	0.0071	0.0065	-0.0061	0.0390***	0.0000	-0.0003	0.0065	0.0094***
Std dev	0.0059	0.0262	0.0226	0.0444	0.0269	0.0100	0.0315	0.0179	0.0444	0.0108
t-Statistic	(18.5)	(1.9)	(1.5)	(0.7)	(-1.1)	(19.5)	(0.0)	(0.0)	(0.7)	(4.3)

Taiwan

	DRm- Rf	DSMB	DHML	DRMW	DCMA	FRm- Rf	FSMB	FHML	FRMW	FCMA
Mean	0.0098***	0.0006	0.0003	0.0013	0.0016	0.0529***	0.0087	0.0065	0.0003	0.0010
Std dev	0.0018	0.0025	0.0031	0.0042	0.0370	0.0140	0.0325	0.0290	0.0539	0.0261
t-Statistic	(27.2)	(1.1)	(0.4)	(1.5)	(0.2)	(18.8)	(1.3)	(1.1)	(0.0)	(0.1)

Table 26 reports the summary statistics for each of the factors. The summary statistics are monthly mean, standard deviation and t-mean (ratio of the mean to its standard error) statistics for each factor for Global Financial Crisis and Euro Zone Crisis respectively. Panel A and Panel B report the summary statistics of the China, Hong Kong and Taiwan stock market under the international model during the Global Financial Crisis and Euro Zone Crisis respectively. DRm-Rf (DMRP) is the market return in excess of the risk-free rate of the domestics model (Market Risk Premium), small minus big (DSMB) is the difference between the return on a portfolio of small market capitalisation stocks and the return on a portfolio of big market capitalisation stocks of the domestics model and high minus low (DHML) is the difference between the return on a portfolio of high book-to-market stocks and the return on a portfolio of low book-to-market stocks of the domestics model, robust minus weak (DRMW) is the difference between the returns on *diversified portfolios of stocks with robust and weak profitability of the domestics model and conservative minus aggressive (DCMA) is the difference between the returns on diversified portfolios of low and high investment firms of domestics model. FRm- Rf (FMRP) is the market return in excess of the risk-free rate of the foreign element in the international model (Market Risk Premium), small minus big (FSMB) is the difference between the return on a portfolio of small market capitalisation stocks and the return on a portfolio of big market capitalisation stocks of the foreign element in the international model and high minus low (FHML) is the difference between the return on a portfolio of high book-to-market stocks and the return on a portfolio of low book-to-market stocks of the foreign element in the international model, , robust minus weak (FRMW) is the difference between the returns on diversified portfolios of stocks with robust and weak profitability of the foreign element of the international model and conservative minus aggressive (FCMA) is the difference between the returns on diversified portfolios of low and high investment firms of foreign of the international model.*

Table 27 reports the summary statistics for each of the factors. The summary statistics are monthly mean, standard deviation and t-mean (ratio of the mean to its standard error) statistics for each factor for Global Financial Crisis and Euro Zone Crisis respectively. Panel A and Panel B report the summary statistics of the China, Hong Kong and Taiwan stock market under the domestic model during the Global Financial Crisis and Euro Zone Crisis respectively.

Table27 Fama and French - Five Factor Model - Integration
Summary Statistics - Averages, standard deviations and t-statistics for month returns - Domestic Model

Panel A: Global Financial Crisis - Domestics

China					
	DRm- Rf	DSMB	DHML	DRMW	DCMA
Mean	0.0247 ***	0.0061 **	0.0036	0.0106 **	0.0117 ***
Std dev	0.0069	0.0119	0.0187	0.0216	0.0212
t-Statistic	(17.8)	(2.5)	(0.9)	(2.4)	(2.7)
	Hong Kong				
	DRm- Rf	DSMB	DHML	DRMW	DCMA
Mean	0.0211 ***	0.3833 *	-0.0078	-0.0053	0.0025
Std dev	0.0057	1.0471	0.2282	0.0236	0.0571
t-Statistic	(18.5)	(1.8)	(-0.1)	(-1.0)	(0.2)
Taiwan					
	DRm- Rf	DSMB	DHML	DRMW	DCMA
Mean	0.0100	0.0025	-0.0033	0.0019 *	-0.0008
Std dev	0.0000	0.0092	0.0135	0.0040	0.0156
t-Statistic	(0.0)	(1.3)	(-1.1)	(2.3)	(0.0)

Panel B:	Euro Zone Crisis - Domestics				
	China				
	DRm- Rf	DSMB	DHML	DRMW	DCMA
Mean	0.0319 ***	-0.0013	0.0006	0.0048	0.0071 ***
Std dev	0.0074	0.0323	0.0180	0.0440	0.0108
t-Statistic	(21.5)	(-0.1)	(0.1)	(0.5)	(3.2)
	Hong Kong				
	DRm- Rf	DSMB	DHML	DRMW	DCMA
Mean	0.0219 ***	0.0103 *	0.0071	0.0065	-0.0061
Std dev	0.0059	0.0262	0.0226	0.0444	0.0269
t-Statistic	(18.5)	(1.9)	(1.5)	(0.7)	(-1.1)
Taiwan					
	DRm- Rf	DSMB	DHML	DRMW	DCMA
Mean	0.0098 ***	0.0006	0.0003	0.0013	0.0016
Std dev	0.0018	0.0025	0.0031	0.0042	0.0370
t-Statistic	(27.2)	(1.1)	(0.4)	(1.5)	(0.2)

Table 27 reports the summary statistics for each of the factors. The summary statistics are monthly mean, standard deviation and t-mean (ratio of the mean to its standard error) statistics for each factor for Global Financial Crisis and Euro Zone Crisis respectively. Panel A and Panel B report the summary statistics of the China, Hong Kong and Taiwan stock market under the domestic model during the Global Financial Crisis and Euro Zone Crisis respectively. DRm- Rf (DMRP) is the market return in excess of the risk-free rate of the domestics model (Market Risk Premium), small minus big (DSMB) is the difference between the return on a portfolio of small market capitalisation stocks and the return on a portfolio of big market capitalisation stocks of the domestics model and high minus low (DHML) is the difference between the return on a portfolio of high book-to-market stocks and the return on a portfolio of low book-to-market stocks of the domestics model, robust minus weak (DRMW) is the difference between the returns on diversified portfolios of stocks with robust and weak profitability of the domestics model and conservative minus aggressive (DCMA) is the difference between the returns on diversified portfolios of low and high investment firms of domestics model.

With the exception of the domestics and foreign market risk premium (FMRP) of the international model in the Taiwan stock market during the Global Financial Crisis, the market risk premium has shown significant t-statistics in the China, Hong Kong and Taiwan stock markets during the Global Financial Crisis and Euro Zone Crisis, under the three difference models – world, international (foreign market risk premium) and domestic. The FMRP is marginally significant under the international model of the Taiwan stock market.

During the Global Financial Crisis, the SMB factor is weakly significant under the world model. Under the domestic model, the factor is significant and weakly marginally significant in the China and Hong Kong stock markets. As for the international model, the foreign small minus big (FSMB) is significant in the Hong Kong market. However, the factor is weakly significant in the China and Taiwan stock markets. The HML factor does not exhibit any form of significance under the three models. The profitability factor is significant and marginal significant in the China and Taiwan stock markets under the domestic model. The foreign profitability factor (FRMW) is significant in the Hong Kong stock market under the international model. In addition, the investment factor is significant in the China stock market under the domestic model. The foreign investment factor (FCMA) is significant in the Hong Kong stock market under the international model.

During the Euzo Zone Crisis, the foreign small minus big factor (FSMB) under the international model is marginally significant in the China stock market. The SMB factor is also weakly significant in the Hong Kong stock market under the domestic model. Similar to the Global Financial Crisis, the HML factor does not exhibit any form of significance under the three models during the Euro Zone Crisis. Furthermore, profitability factor also does not exhibit any form of significance under the three models during the Euro Zone Crisis. The investment factor is significant in the China stock market under the domestic model. The foreign investment factor is also significant in the Hong Kong stock market under the international model.

Table 28 shows the regression results of monthly portfolio returns on market risk premium (MRP), market capitalisation (SMB), book-to-market (HML), profitability factor (RMW) and investment factor (CMA), under three models which examine the effect of integration – world, international and domestics. Panel A, Panel B and Panel C report the regression results of 25 portfolios of the China, Hong Kong and Taiwan stock markets during Global Financial Crisis. Panel D, Panel E and Panel F report the regression results of 25 portfolios of the China, Hong Kong and Taiwan stock markets during Euro Zone Crisis. The standard errors are estimated in the presence of a fixed firm effect (CL-F), a time effect (CL-T) and a fixed firm and time effect (CL – F&T).For full results, please see Appendix D

Table 28 Regression Results of Monthly Portfolio Returns on Market Risk Premium / Excess Market Return (MRP), Market Capitalisation (SMB) and Book-to-Market (HML), Profitability Factor (RMW) and Investment Factor (CMA) – Market Integration

Panel A: Global Financial Crisis - China

	WMRP		WSMB		WHML		WRMW		WCMA	Adjusted R2	Std. Errors
World	0.0999		0.0041		0.0632		-1.2424	***	0.5991	0.2578	CL-T
	(0.06)		(0.38)		(0.91)		(-3.16)		(0.96)		
	DMRP		DSMB		DHML		DRMW		DCMA		
Intl.	6.0013	**	-3.5234	***	-0.2329		-1.3953		0.9574		
	(1.97)		(-2.71)		(-0.21)		(-0.66)		(0.48)		
	FMRP		FSMB		FHML		FRMW		FCMA	Adjusted R2	Std. Errors
	-3.4924		-0.0065		0.0719		-0.9775	***	-0.4390	0.4552	CL-T
	(-1.37)		(-0.48)		(0.84)		(-3.12)		(-0.52)		
	DMRP		DSMB		DHML		DRMW		DCMA	Adjusted R2	Std. Errors
Dom.	1.0835		-4.1817	**	0.1550		-4.5175	**	4.0298	*0.2183	CL-T
	(0.36)		(-2.10)		(0.13)		(-2.20)		(1.93)		

Panel B: Global Financial Crisis - Hong Kong

	WMRP		WSMB		WHML		WRMW		WCMA	Adjusted R2	Std. Errors
World	-		0.0117	***	-0.2251	***	-		-	0.5733	CL - F & T
			(3.04)		(-9.42)						
	DMRP		DSMB		DHML		DRMW		DCMA		
Intl.	-		0.0083	**	-0.2279	***	-		-		
			(2.13)		(-9.41)						
	FMRP		FSMB		FHML		FRMW		FCMA	Adjusted R2	Std. Errors
	-		-		-		-		-	0.5709	CL - F & T
	DMRP		DSMB		DHML		DRMW		DCMA	Adjusted R2	Std. Errors
Dom.	-		0.0083	**	-0.2279	***	-		-	0.5733	CL - F & T
			(2.13)		(-9.41)						

Panel C: Global Financial Crisis - Taiwan

	WMRP	WSMB	WHML	WRMW	WCMA	Adjusted R2	Std. Errors
World	-2.2334	0.0089	0.0306	-1.2713 ***	1.1647	*0.0915	CL-T
	(-1.41)	(0.82)	(0.56)	(-3.73)	(1.87)		
	DMRP	DSMB	DHML	DRMW	DCMA		
Intl.	-	-1.8332	-0.8178	-3.4155	-1.2556		
		(-0.44)	(-0.19)	(-1.28)	(-0.37)		
	FMRP	FSMB	FHML	FRMW	FCMA	Adjusted R2	Std. Errors
	-2.8022	0.0096	0.0304	-1.0394 ***	1.0613	*0.1081	CL - T
	(-1.61)	(0.85)	(0.61)	(-2.78)	(1.66)		
	DMRP	DSMB	DHML	DRMW	DCMA	Adjusted R2	Std. Errors
Dom.	-	-4.6799	-1.3886	-4.1648	0.5064	0.0406	CL - T
	(-0.93)	(-0.30)	(-1.35)	(0.10)			

Panel D: Euro Zone Crisis - China

	WMRP	WSMB	WHML	WRMW	WCMA	Adjusted R2	Std. Errors
World	26.4532***	0.8722	1.0170	-1.8316	-1.0092	0.4120	CL-T
	(4.96)	(0.54)	(0.42)	(-0.81)	(-0.58)		
	DMRP	DSMB	DHML	DRMW	DCMA		
Intl.	11.1585	2.0773	4.6390	-3.2798	-2.8004		
	(0.77)	(0.59)	(0.70)	(-0.34)	(-1.09)		
	FMRP	FSMB	FHML	FRMW	FCMA	Adjusted R2	Std. Errors
	45.1145 **	1.4981	1.5048	-2.5981	-0.4073	0.3517	CL-T
	(2.26)	(0.36)	(0.48)	(-1.19)	(-0.06)		
	DMRP	DSMB	DHML	DRMW	DCMA	Adjusted R2	Std. Errors
Dom.	32.5581 ***	1.9221	3.1378	-1.4273	-1.3192	0.2015	CL-T
	(2.78)	(0.74)	(0.45)	(-0.13)	(-0.48)		

Panel E: Euro Zone Crisis - Hong Kong

	WMRP	WSMB	WHML	WRMW	WCMA	Adjusted R2	Std. Errors
World	0.1946	-0.1766	0.6350	-0.3147	-0.5919 **	0.0672	CL-T
	(0.19)	(-0.45)	(1.24)	(-0.46)	(-2.36)		
	DMRP	DSMB	DHML	DRMW	DCMA		
Intl.	2.8919	0.7057	-0.3747	-0.2524	-0.9052 ***		
	(0.83)	(1.27)	(-0.70)	(-0.58)	(-2.90)		
	FMRP	FSMB	FHML	FRMW	FCMA	Adjusted R2	Std. Errors
	-1.6900	1.0127 ***	3.1186 ***	-3.2095 ***	-	0.1234	CL-T
	(-0.92)	(2.76)	(4.45)	(-2.69)			
	DMRP	DSMB	DHML	DRMW	DCMA	Adjusted R2	Std. Errors
Dom.	-0.6592	0.2729	-0.4137	-0.5496	-0.5084 *	0.0443	CL-T
	(-0.32)	(0.48)	(-0.61)	(-0.97)	(-1.65)		

Panel F: Euro Zone Crisis - Taiwan

	WMRP	WSMB	WHML	WRMW	WCMA	Adjusted R2	Std. Errors
World	-0.0358	-0.2874	1.0009 **	-0.5497	-0.5158 ***	0.2517	CL-T
	(-0.03)	(-0.67)	(2.06)	(-1.02)	(-2.62)		
	DMRP	DSMB	DHML	DRMW	DCMA		
Intl.	6.6653 *	9.2336 ***	-0.9241	-1.8659	-2.9369		
	(1.79)	(3.03)	(-0.55)	(-0.85)	(-0.91)		
	FMRP	FSMB	FHML	FRMW	FCMA	Adjusted R2	Std. Errors
	-0.2982	-0.1829	0.8838	-0.4596	-0.4271 **	0.3699	CL-T
	(-0.29)	(-0.42)	(1.64)	(-0.85)	(-2.53)		
	DMRP	DSMB	DHML	DRMW	DCMA	Adjusted R2	Std. Errors
Dom.	6.2653 ***	11.2044 ***	-3.7219 ***	-3.1135	-2.3794	0.1940	CL-T
	(3.86)	(5.80)	(-3.18)	(-1.17)	(-0.72)		

Notes: Values in the parentheses are the t-statistics. *, **, *** significant at 10%, 5%, 1% respectively

Table 28 shows the regression results of monthly portfolio returns on market risk premium/ excess market return (MRP), market capitalisation (SMB), book-to-market (HML), profitability factor (RMW) and investment factor (CMA), under three models which examine the effect of integration – world, international and domestics. Panel A, Panel B and Panel C report the regression results of 25 portfolios of the China, Hong Kong and Taiwan stock markets during Global Financial Crisis. Panel D, Panel E and Panel F report the regression results of 25 portfolios of the China, Hong Kong and Taiwan stock markets during Euro Zone Crisis. Coefficients (t-statistics) are presented from the OLS using monthly cross section time series data for China, Hong Kong and Taiwan stock markets during Global Financial Crisis and Euro Zone Crisis. OLS regressions are presented for each of the stock market, where a separate regression is estimated for each of the model. The standard errors are estimated in the presence of a fixed firm effect (CL-F), a time effect (CL-T) and a fixed firm and time effect (CL – F&T).

Global Financial Crisis

During the Global Financial Crisis, the domestic market risk premium (DMRP) is weakly significant under the international model of the China stock market. The domestic SMB factor (DSMB) factor is significant and marginally under the international and domestic model. The domestic SMB (DSMB) shows size effect under the international and domestic model, as the coefficients are negative. As for the HML factor, it is insignificant under the three models. The profitability factor under the world model (WRMW) and the foreign profitability factor (FRMW) are significant under the international model. On the other hand, the domestic profitability factor is marginally significant under the domestic model. Lastly, the investment factor is weakly significant under the domestic model.

The adjusted R-squared of the world, international and domestic models are 0.26, 0.46 and 0.22 respectively.

In Hong Kong, the SMB factor is significant under the world model. In addition, the domestic SMB factor (DSMB) of the international and domestic models is marginally sigificant. As for the HML factor, it is significant under the world model. Further examination shows that the domestic HML (DHML) is significant under the international and domestics model. As the coefficients are negative, growth effects are observed.

The adjusted R-squared of the world, international and domestic models are 0.57, 0.57 and 0.57 respectively

In Taiwan, the profitability factor (RMW) has negative coefficients under the world model. The foreign profitability factor (RMW) also has negative coefficients under the international model.

The adjusted R-squared of the world, international and domestic models are 0.09, 0.11 and 0.04 respectively.

Euro Zone Crisis

In China, the market risk premium factor (MRP) factor is significant under the world model. In addition, the foreign market risk premium factor (FMRP) factor of the international model is marginally significant and the domestic market risk premium factor (DMRP) factor of the domestic model is significant.

The adjusted R-squared of the world, international and domestic models are 0.41, 0.35 and 0.20 respectively.

In Hong Kong, foreign SMB (FSMB) factor and the foreign HML (FHML) factor are positively significant under the international model. As for the HML factor, it is significant under the world model. Furthermore, the foreign HML (FHML) factor is negatively significant under the international model. The investment factor (CMA) is negatively significant under the world model. Also, the domestic investment factor (DCMA) of the international model is also negatively significant. Under the domestic model, the investment factor (DCMA) is weakly significant.

The adjusted R-squared of the world, international and domestic models are 0.07, 0.12 and 0.04 respectively.

In Taiwan, the domestic market risk premium factor is weakly significant and significant under the international and domestic models. Furthermore, the domestic SMB factor (DSMB) is significant under the international and domestic. The profitability factor (RMW) is insignificant under the three models. Lastly, investment factor (CMA) of the world model and the foreign investment factor (FCMA) of the international model are significant and marginally significant respectively.

The adjusted R-squared of the world, international and domestic models are 0.25, 0.37 and 0.19 respectively.

5.5 Empirical Discussion – China, Hong Kong and Taiwan Stock Markets

5.5.1. Banko, Conover and Jensen Model (2006)

In determining if the value effect is firm specific, industry specific, or present at both industry and firm levels, the findings of Table 11 shed light that the both industrial book-to-market ratios are significant independent variables in explaining the value premium in the China stock market during Global Financial Crisis.Market capitalisation and beta are another two significant independent variables. In Hong Kong, growth effect is observed with negative firm book-to-market coefficient, whiles size effect is exhibited with negative market capitalisation coefficient. Industrial book-to-market ratios, however, becomes significant after controlling for market capitalisation and betain model 4 and model 5. On the other hand, value effect is manifested in Taiwan stock market with highly significant firm book-to-market coefficient.

During the Euro Zone Crisis, none of the variables of the China stock market - firm book-to-market, industrial book-to-market, market capitalisation and beta is significant statistically. In Hong Kong, however, growth effect is once again observed with negative firm book-to-market coefficient. The industrial book-to-market is weakly significant in the Taiwan stock market after controlling for market capitalisation and beta.

The observations and findings in the Hong Kong stock market during the Global Financial Crisis and Euro Zone Crisis are consistent with the preliminary evidence in Empirical Analaysis1 - that growth stocks outperformed value stocks during both the Global Financial Crisis and Euro Zone Crisis in the Hong Kong stock. In addition the value stocks outperformed the growth stocks in the Taiwan stock market during the Global Financial Crisis . Lee, Strong and Zhu (2014) have shown evidence that in value stocks significantly underperformed growth stocks during the subprime credit crisis of the U.S. market.

From the analysis and discussion of the empirical results, it shows that the risk measures – firm book-to-market, industry book-to-market, market capitalization and beta do not fully explain the value premium phenomenon of the China, Hong Kong and Taiwan stock market during the Global Financial Crisis and Euro Zone Crisis, inconsistent with the proposition of Banko, Conover and Jensen Model (2006). In their research, they have argued that both industry-and firm-level value effects are identified; however, the firm level effect is the more prominent of the two. In this research, it shows that firm level effect is the more prominent in the Hong Kong stock market during both crises and Taiwan stock market during the Euro Zone Crisis. Nevertheless, the industrial book-to-market is more prominent in the China stock market during the Global Financial Crisis.

By adopting the methodology of Banko et al. (2006), the formation of portfolio is designed to isolate the returns specifically associated with BE/ME. This procedure is used to control for market capitalization and beta which may have been shown to have a significant relationship with returns, thereby avoiding the identification of a spurious relationship.

Furthermore, the adjusted R-squared values are extremely low during the Euro Zone Crisis.

In examining the prevalence of the value effect across the sample of industries during two major financial crises, the results in Table 12 for China, Hong Kong and Taiwan stock markets during the Global Financial Crisis show that industry book-to market ratio is the most prominent risk measure in explaining the value premium phenomenon during that period. However, neither the factors - industry book-to market ratio nor the firm book-to-market ratio is a significant statistically in the three stock markets during the Euro Zone Crisis. The adjusted R –squared values are still low during the Euro Zone Crisis. Chang and Luo (2010) have argued that stocks with lower R-squared have poor information quality and are more likely to be subject to noise trading. Based on the result of their research, it is suggested that the trading activities of noise traders are correlated and affect stock returns in a systematic way. These activities may contribute to the argument that "it's not merely that there is no longer a signal amid the noise, but the noise is being amplified" (Nate Silver, 2012). The issue of adjusted R-squared and stock returns will be further examined in Fama and French Three Factor Model (1992, 1993) and Fama and French Five Factor Model (2014).

Therefore, based on the empirical results and the adjusted R-squared values by using the Banko, Conover and Jensen Model (2006), the research argues that the risk measures – firm book-to-market, industry book-to-market, market capitalization and beta do not fully explain the value premium phenomenon of the China, Hong Kong and Taiwan stock market during the Global Financial Crisis and Euro Zone Crisis.

5.5.2 Fama and French Three Factor Model (1992, 1993)

Overall Firm

The market risk premium (MRP) factor of the Taiwan stock has a coefficient of -5.1699 and -4.7456 respectively during the Global Financial Crisis and Euro Zone Crisis. The negative coefficients are with t-statistic values of -2.84 and -26.14, significant at 1% level. It is suggested that the results may be caused by the portfolio rebalancing decision of the investors and traders, shorting equity especially and longing fixed income securities to ensure safety of the financial assets. Equity is a riskier financial asset than the fixed income securities. However, the high positive efficient of 19.1574 for the MRP factor in the China stock market during the Euro Zone Crisis represents a puzzle. The coefficient is with t-statistics value of 6.42, significant at 1% level. This research believes the phenomenon may be caused by level of sophistication of the investors (Stein, 2009) in the China stock market. It is a common knowledge that a large proportion of the players in the China stock market are uninformed retail investors. The uninformed retail investors either do not have or lacking in the financial knowledge to rebalance portfolio during Euro Zone Crisis. Based on the empirical results, it is argued that the market risk premium (MRP) factor is a semi-strong signal.

During the Global Financial Crisis, the SMB factor has a coefficient of -2.0574 in the China stock market. The t-statistic value is -1.90, significant at 10% level. As the coefficient is negatively, size effect is observed. During the same period, however, the SMB factor has a positively coefficient of 0.0028 in the Hong Kong stock market. The t-statistics value is 1.97, significant at 5% level. While during the Euro Zone Crisis, the SMB factor has a coefficient of -0.6738 in the Taiwan stock market. The t-statistics value is -16.12, significant at 1% level. From the results, it appears that the cross sectional return does not fully captured the SMB factor in the three stock markets during the Global Financial Crisis and Euro Zone Crisis. The size effect is only seen in the China stock market during the Global Financial Crisis and Taiwan stock market during the Euro Zone Crisis. It is therefore proposed that the SMB factor is a semi-strong signal.

Thirdly, the HML factor of the Hong Kong and Taiwan stock markets has a coefficient of -0.0829 and -0.6095 respectively during the Global Financial Crisis. The t-statistics values are -9.39 and -2.67 respectively, significant at 1% level. The HML factor, however, is insignificant in the three stock markets during the Euro Zone Crisis. Based on the empirical results, it is argued that the HML factor is a semi-strong signal.

The adjusted R-squared for the China, Hong Kong and Taiwan stock markets are 0.15, 0.57 and 0.11 respectively during the Global Financial Crisis. During the Euro Zone Crisis, the R-squared changes to 0.36, 0.05 and 0.19 respectively.

The empirical results and the adjusted R-squared by using the Fama and French Three Factor Model (2006) of this research suggests that the risk measures – market risk premium (MRP), SMB factor and HML factor do not fully explain the value premium phenomenon of the China, Hong Kong and Taiwan stock market during the Global Financial Crisis and Euro Zone Crisis. The Fama and French three factors - market risk premium (MRP) factor, SMB factor and HML factor are semi-strong signals.

Market Capitalisation

The further analysis from the findings of the table 16 reveals that during the Global Financial Crisis, the market risk premium (MRP) factor of the small market capitalisation portfolios in the Hong Kong stock market has a coefficient of -2.1702. The t-statistic value is -2.05, significant at 5 % level. During the Euro Zone Crisis, the MRP factor of the small market capitalisation portfolios in the Hong Kong and Taiwan stock markets has a coefficient of -1.7355 and -4.2799 respectively. The t-statistic values are -2.10 and -1.75, significant at 5 % and 1% levels respectively. The market risk premium factor demonstrates significant coefficients only in the small market capitalisation portfolios, but not big market capitalisation portfolios during these two financial crises. The empirical results suggest that it may be due to portfolio rebalancing decision of the investors and traders in the small market capitalisation portfolios of the Hong Kong stock markets during the two financial crises, shorting equity especially and longing fixed income securities to ensure safety of the financial assets. Similarly, the investors and traders in the small market capitalisation portfolios of the Taiwan stock markets may carried out similar portfolio rebalancing activities. Based on the empirical results, it is therefore suggested that the market risk premium factor is a semi-strong signal.

As for the SMB factor, the small capitalisation portfolios in both the China and Taiwan markets have coefficients of -1.1222 and -1.6075 in the China and Taiwan stock markets respectively during the Global Financial Crisis. The t-statistics values are -2.71 and -6.97, significant at 1 % respectively. As the coefficients are negative, size effects are observed. Also, the big market capitalisation portfolios of the Taiwan stock market have a coefficient of 1.1942. The t-statistics value is 3.95, significant at 1 % level. During the Euro Zone Crisis, the SMB factor of the small capitalisation portfolios in both the China and Taiwan markets have coefficients of -1.2170 and -0.5587 in the China and Taiwan stock markets respectively. The t-statistics values are -2.64 and -2.84, significant at 1 % respectively. As the coefficients are negative, size effects are observed. Also, the big market capitalisation portfolios of the China stock market have a coefficient of 0.6192. The t-statistics value is 2.98, significant at 1 % level. Based on the interpretation above, it appears that the SMB factor is significant in small market capitalisation portfolios of the China and Taiwan stock markets during the two financial crises. It is argued that the SMB factor is a semi-strong signal.

As for the HML factor, the small capitalisation portfolios in both the China and Taiwan stock markets have coefficients of 0.4098 and -1.8956 respectively during the Global Financial Crisis. The t-statistics values are 3.44 and -12.26, significant at 1 % respectively. The positive and negative signs of the coefficient for the China and Taiwan stock markets have been mixed and inconsistent. It is suspected that this phenomenon could be the effect of unstable trading activities of these two stock markets during the Global Financial Crisis. During the Euro Zone Crisis, the small market capitalisation portfolios of the Hong Kong stock market have a coefficient of -0.3291. The t-statistics value is -2.27, significant at 5% level. On the other hand, the big capitalisation portfolios in both the China and Hong Kong stock markets have coefficients of 0.6403 and 0.3097 respectively during the Euro Zone Crisis. The t-statistics values are 4.34 and 3.43, significant at 1 % respectively. Based on the empirical results, it is proposed that the HML factor is a semi-strong signal.

Similarly to the analysis and discussion at the overall firm level, the empirical results and the adjusted R-squared by using the Fama and French Three Factor Model (2006) of this research suggests that the risk measures – market risk premium (MRP), SMB factor and HML factor do not fully explain the value premium phenomenon of the China, Hong Kong and Taiwan stock market during the Global Financial Crisis and Euro Zone Crisis. The Fama and French three factors - market risk premium (MRP) factor, SMB factor and HML factor are semi-strong signals.

Integration

During the Global Financial Crisis, the foreign market risk premium (FMRP) factor of the international model in the Taiwan stock market has a coefficient of -3.6548. The t-statistics value is 1.68, at 10 % significant level. The result suggests that the investors and traders of the Taiwan stock markets may carry out portfolio rebalancing activities, shorting equity especially and longing foreign fixed income securities to ensure safety of the financial assets. The market risk premium factor is insignificant in the China and Hong Kong stock markets when considering integration issue.

During the Euro Zone Crisis, the market risk premium factor of the China stock market has a coefficient of 25.1392 and 30.3165 for the world and domestic models. The t-statistical values are 7.38 and 3.64, at 1% significant level respectively. In addition, the foreign market risk premium (FMRP) factor of the international model in the China stock market has a coefficient of 39.9349. The t-statistics value is 2.39, at 5 % significant level. The results suggest that the uninformed retail investors, which constitute a large proportion of the players in the China stock market, either do not have or lacking in the financial knowledge to rebalance portfolio. In Hong Kong, the foreign market risk premium (FMRP) factor of the international model has a coefficient of -3.7272. The t-statistics value is -1.95, at 10 % significant level. Lastly, the domestic market risk premium of the international and domestic models of the Taiwan stock market has a coefficient of 7.3351 and 5.4733, at 1% significant level. The result suggest that rebalancing of portfolio is carried in the domestic market and a large proportion of the participants of the Taiwan stock market are domestic players – traders and investors alike. Based on the empirical results, the market risk premium factor is considered to be a semi-strong signal.

During the Global Financial Crisis, the domestic SMB (DSMB) factor has a coefficient of -3.9835 and -4.0009 under the international and domestic models of the China stock market. The t-statistics values are -2.01 and -1.79 respectively, significant at 5% and 10 % levels. Size effect is observed, as the coefficients are negative. The result may suggest that the size effect is influenced by the domestic shares which are listed in the China stock market. In addition, domestic SMB (DSMB) factor of the Hong Kong stock market has a coefficient of 0.0083 under both the international and domestic models. The t-statistics values are 2.55 and 2.13 respectively, significant at 1% and 5 % levels. The SMB factor is also significant at 1% level under the world model with a coefficient of 0.0117 and t-statistics value of 3.04. It appears that both the shares in the regional stock markets as a whole – China, Hong Kong and Taiwan as well as domestic shares in the Hong Kong stock market are contributing to the significant SMB factor. In Taiwan, the SMB factor is significant at 5% level under the world model with a coefficient of 0.0119 and t-statistics value of 1.97.

During the Euro Zone Crisis, the SMB factor is insignificant in the China and Hong Kong stock markets. As for the Taiwan stock market, the domestics SMB (DSMB) factor has a coefficient of 7.9134 and 10.8068 under the international and domestic models respectively. The t-statistics values are 2.80 and 6.48 respectively, significant at 1% level. It is argued that the SMB factor is a semi-strong signal.

During the Global Financial Crisis, the HML factor of the China stock market has a coefficient of -0.2251 under with world model. The t-statistics value is -9.42, significant at 1% level. In addition, the domestic HML (DHML) factor has a coefficient of -0.2279 and -0.2279 respectively under the international and domestic models. The t-statistics values are -7.94 and -9.41, significant at 1% level. As the coefficients are negative, growth effect is observed. In Taiwan, the domestic HML (DHML) factor of the international model has a coefficient of -6.0683. The t-statistic value is -2.00, significant at 5% level. However, the HML factor is insignificant in the Chinese stock market during the Global Financial Crisis.

On the other hand, the HML factor has a coefficient of 1.3772 in the Hong Kong stock market during the Euro Zone Crisis. The t-statistic value is 2.66, significant at 1% level. Similar to the Global Financial Crisis, the HML factor is insignificant in the Chinese stock market during the Euro Zone Crisis. In Taiwan, however, the HML factor has a coefficient of 0.8387, with a t-statistic value of 2.13 and is significant at 5 % level. As for the international model, the foreign HML factor is significant at 1 % level. The coefficient is 0.7313 and t-statistics value of 1.96. Lastly, the HML factor has a coefficient of -4.2511 and t-statistic value of -3.72, significant at 1% level. From the empirical results, the cross sectional return of stocks in the Greater China stock markets do not seemed to fully captured the HML factor. Therefore, the HML factor is classified as a semi-strong signal.

The adjusted R-squared values have improved in the China and Taiwan stock markets from the Global Financial Crisis to the Euro Zone Crisis. From the discussion above, the risk measures – market risk premium (MRP), SMB factor and HML factor do not fully explain the value premium phenomenon of the China, Hong Kong and Taiwan stock market during the Global Financial Crisis and Euro Zone Crisis. The Fama and French three factors - market risk premium (MRP) factor, SMB factor and HML factor are considered to be semi-strong signals.

5.5.3 Fama and French Five Factor Model (2015)

Overall Firm

The market risk premium (MRP) factor has a coefficient of -4.1643 and -4.8333 in the Taiwan stock market during the Global Financial Crisis and Euro Zone Crisis respectively.

The t-statistics values are -2.59 and -2.14, significant at 1% and 5% respectively. Furthermore, the MRP factor is significant at 1% level in the China stock market during Euro Zone Crisis, with a coefficient of 19.4718 and t-statistics value of 5.43.

The results in the Taiwan stock market may suggest that the participants of the stock market – traders and investors rebalanced their portfolios - shorting equity especially and longing fixed income securities to ensure safety of the financial assets. It is commonly known that equities represent a riskier investment than the fixed income securities. On the other hand, the positive coefficient of the MRP factor in the factor in the China stock market during the Euro Zone Crisis may be due to the trading approach or strategy of the uninformed retail investors. It is a well-known fact that a large proportion of the players in the China stock market are uninformed retail investors. It is an issue of level of sophistication of the investors (Stein, 2009) in the China stock market. These participants either do not have or lacking in the financial knowledge to make the necessary adjustment and changes in their investing decisions during Euro Zone Crisis. Based on the empirical results, it is argued that the market risk premium (MRP) factor is a semi-strong signal.

As for the SMB factor, it has a coefficient of -2.2699 and 0.0028 in the China and Hong Kong stock markets respectively during the Global Financial Crisis. The t-statistical values are -2.07 and 2.36, significant at 5% level in both instances. Size effect is observed in the China stock market, as the coefficient is negative. However, the SMB factor is insignificant in the three stock markets during the Euro Zone Crisis. Based on the empirical results and analysis, it appears that the cross sectional return of stock does not fully captured the SMB factor in the three Great China stock markets during the two financial crises. It is, therefore, suggested that the SMB factor is a semi-strong signal.

As for the HML factor, it has a coefficient of -0.0829 and -0.6704 in the Hong Kong and Taiwan stock markets respectively during the Global Financial Crisis. The t-statistics values are -7.93 and -1.72, significant at 1% and 10% respectively. Growth effect is observed as the coefficients are negative. However, the HML factor is insignificant in the three stock markets during the Euro Zone Crisis. Based on the empirical results and analysis, it appears that the cross sectional return of stock does not fully captured the HML factor in the three Great China stock markets during the two financial crises. It is, therefore, suggested that the HML factor is a semi-strong signal

The profitability factor (RMW) has a coefficient of -1.1055 in the Taiwan stock market during the Global Financial Crisis. The t-statistical value is -1.67, significant at 10% level. However, the factor is insignificant in the three stock markets during the Euro Zone Crisis. The profitability factor (RMW) is considered to be a weak signal.

Lastly, the investment factor is insignificant in the three stock markets during both the financial crises.

The adjusted R-squared is slightly higher in the Fama and French Five Factor model than in the Fama and French Three Factor model.

Consistent with the argument of the Fama and French Three Factor model, the research argues that the risk measures of the Fama and French Five Factor Model do not fully explain the value premium phenomenon of the China, Hong Kong and Taiwan stock market during the Global Financial Crisis and Euro Zone Crisis. The market risk premium (MRP) factor, SMB factor and HML factor are considered to be semi-strong signals, whilst the profitability factor (RMW) is considered to be a weak signal.

Market Capitalisation

During the Global Financial Crisis, the market risk premium (MRP) factor has a coefficient of -2.1308 in the big market capitalisation portfolios of the Hong Kong stock market. The t-statistics value is -2.63, significant at 1% level. During the Euro Zone Crisis, the MRP factor has a coefficient of -1.7853 and -4.0573 in the small market capitalisation portfolios of the Hong Kong and Taiwan stock markets respectively. The t-statistics values are -2.22 and -2.22 respectively, significant at 5% level. As for the big market capitalisation portfolio of the Taiwan stock market, the MRP factor has a coefficient of -4.0112. The t-statistics value is -2.33, significant at 5% level. The negative coefficient of the significant factor suggest that in order to ensure safety of the financial assets and the measure to mitigate loss, the traders and investors carried out portfolio rebalancing activities - shorting equity especially and longing fixed income securities. In this context, the MRP factor is considered to be a semi-strong signal.

During the Global Financial Crisis, the SMB factor has a coefficient of -0.9115 in the small market capitalisation portfolios of the China stock market. The t-statistics value, significant at 5% level is -2.13. Size effect is observed, with the negative coefficient. However, the SMB factor is inefficient for the big market capitalisation portfolios of the three stock markets during the same period.

During the Euro Zone Crisis, the SMB factor has a coefficient of -1.4897 and -0.5832 in the small market capitalisation portfolios of the China and Hong Kong stock markets respectively. The t-statistics values are -4.70 and -2.37, significant at 1% and 5% level respectively. Size effect is observed, with the negative coefficient. For the big market capitalisation portfolios of the China stock market, the SMB factor has a coefficient of 0.921. The t-statistics value is 2.07, significant at 5% level. At the market capitalisation level, the empirical results suggest that the cross sectional return of stock does not fully captured the SMB factor in the three Great China stock markets during the two financial crises. Hence, the SMB factor is classified as a semi-strong signal.

The HML factor is insignificant for both the small and big market capitalisation portfolios of the three stock markets during the Global Financial Crisis. During the Euro Zone Crisis, the HML factor has a coefficient of -0.4744 and -0.3441 in the small market capitalisation portfolios of the China and Hong Kong stock markets respectively. The t-statistics values are -1.93 and -2.56, significant at 10% and 5% level respectively. As for the big market capitalisation portfolio, the HML factor exhibit coefficient of 0.6158 in the China stock market. The t-statistics value is 3.73, significant at 1% level. At the market capitalisation level, the empirical results suggest that the cross sectional return of stock does not fully captured the HML factor in the three Great China stock markets during the two financial crises. Hence, the HML factor is classified as a semi-strong signal.

As for the profitability factor (RMW), it shows a mixed result. The factor is significant in the big capitalisation portfolios of the Taiwan stock market during the Global Financial Crisis. The factor has a coefficient of 2.1690 and a t-statistics of 6.92, significant at 1% level. However, the factor is insignificant in the small market capitalisation portfolios of the three stock markets during the Global Financial Crisis. During the Euro Zone Crisis, the small market capitalisation portfolios of the China and Taiwan stock markets have a coefficient of 0.5883 and 1.1791 respectively. The t-statistical values are 1.69 and 3.27, significant at 10% and 1% respectively. The big market capitalisation portfolios of the Taiwan stock market have a coefficient of -2.2734. The t-statistics value is -4.96, significant at 1% level. With the exception of the small market capitalisation portfolios during the Global Financial Crisis, it appears that the profitability factor (RMW) is significant in both the small and big market capitalisation portfolios during both the financial crises. On this ground, it is argued that the profitability factor is a semi-strong signal.

Although the analysis at the overall firm level shows that the investment factor (CMA) is insignificant in the three stock markets during both the financial crises. Further analysis reveals a different picture. During the Global Financial Crisis, the small market portfolio of the Hong Kong stock market has a coefficient of 0.6433. The t-statistic value is -1.75, significant at 10% level. Furthermore, the big market capitalisation portfolios of the Hong Kong and Taiwan stock markets have a coefficient of -1.4235 and -2.1816. The t-statistic values are -5.55 and -4.05, significant at 1% respectively.

During the Euro Zone Crisis, the small market capitalisation portfolios of the China and Taiwan stock market have a coefficient of -1.0545 and -1.5247. The t-statistic values are -4.82 and -3.14, significant at 1% respectively. urthermore, the big market capitalisation portfolios of the Taiwan stock market has a coefficient of 3.0850. The t-statistic value is 4.63, significant at 1%. The empirical results from the further analysis at the market capitalisation level suggest that the investment factor (CMA) is a semi-strong signal.

The adjusted R-squared values obtained by using the Fama and French Five Factor Model are generally higher than those of the Fama and French Three Factor Model.

From the discussion above, it is argued that the risk measures of the Fama and French Three Factor Model do not fully explain the value premium phenomenon in the small and big market capitalisation portfolios of the China, Hong Kong and Taiwan stock market during the Global Financial Crisis and Euro Zone Crisis. The market risk premium (MRP) factor, SMB factor, HML factor, profitability factor (RMW) and investment factor (CMA) are considered to be semi-strong signals.

Integration

During the Global Financial Crisis, the domestic market risk premium factor (MRP) of the international model in the China stock market has a coefficient of 6.0013. The t-statistic value is 1.97, significant at 5% level. The market risk premium factor, however, is insignificant in the Hong Kong and Taiwan stock markets during the same period. During the Euro Zone Crisis, the market risk premium factor of the China stock market has a coefficient of 26.4532 and 32.5581 under the world and domestic models. The t-statistics values are 4.96 and 2.78 respectively, significant at 1 % level. The empirical results suggest that both the portfolio rebalancing activities are carried out at the regional and domestic capital markets. In addition, the foreign market risk premium factor (FMRP) of the international model has a coefficient of 45.1145 and a t-statistic value of 2.26, significant at 5% level. In Taiwan, however, the market risk premium factor of the Taiwan stock market has a coefficient of 6.2653 under the domestic model. The t-statistics value is 3.86, significant at 1 % level. This result provides evidence that the portfolio rebalancing decision in Taiwan during the Euro Zone Crisis is carried out in the domestic financial market. It is suggested that the market risk premium factor (MRP) is a semi-strong signal.

During the Global Financial Crisis, the domestic SMB (DSMB) factor of the international and domestic models of the China stock market has a coefficient of -3.5234 and -4.1817 respectively. The t statistic values are -2.71 and -2.10, significant at 1% and 5% respectively. The results suggest that the size effect is stronger in the domestic China stock market, with the negative coefficient. Similarly, the domestic SMB (DSMB) factor of the international and domestic models of the Hong Kong stock market has a coefficient of 0.0083 and 0.0083 respectively. The t statistic values are 2.13 and 2.13, significant at 5% levels. In addition, the SMB factor has a coefficient of 0.0117 under the world model. The t –statistic value is 3.04, significant at 1% level. However, the SMB factor is insignificant in the Taiwan stock market during the Global Financial Crisis. During the Euro Zone Crisis, the SMB factor is insignificant in the China stock market. In the Hong Kong stock market, the foreign SMB (FSMB) factor of the international model has a coefficient of 1.0127. The t-statistic value is 2.76, significant at 1% level. Furthermore, the domestic SMB (DSMB) factor of the international and domestic models in the Taiwan stock market has a coefficient of 9.2336 and 11.2044. The t-statistic values are 3.03 and 5.80, significant at 1% level. The empirical analysis above suggests that at the integration level, the cross sectional of stock return does not fully captured the SMB factor. Hence, it is proposed that the SMB factor is to be classified as a semi-strong signal.

During the Global Financial Crisis, the HML factor of the world model in the Hong Kong stock market has a coefficient of -0.2251. The t-statistics value is -9.42, significant at 1% level. In addition, the domestic HML (DHML) factor of both the international and domestic model has a coefficient of -0.2279. The t-statistics value is -9.41, significant at 1% level. As the coefficient is negative, the growth effect is observed. However, the HML factor is insignificant in both the China and Taiwan stock markets during the Global Financial Crisis. During the Euro Zone Crisis, the foreign HML factor of the international model in the Hong Kong stock market has a coefficient of 3.1186. The t-statistics value is 4.45, significant at 1% level. As for the Taiwan stock market, the HML factor has a coefficient of 1.0009 and -3.7219 respectively under the world and domestic models. The t-statistics values are 2.06 and -3.18, significant at 5% and 1% respectively. The empirical evidence suggests that at the integration level, the cross sectional of stock return does not fully captured the HML factor. Therefore, it is proposed that the HML factor is to be considered as a semi-strong signal.

As for the profitability factor (RMW), it has a coefficient of -1.2424 and -4.5175 under the world and domestic models of the China stock market during the Global Financial Crisis. The t-statistics values are -3.16 and -2.20 respectively, significant at 1% and 5% levels. Furthermore, the foreign profitability factor (FRMW) has a coefficient of -4.5175. The t-statistic value is -2.20, significant at 5 % level. The factor, however, is insignificant in the Hong Kong stock market during the Global Financial Crisis. In Taiwan, the profitability factor (RMW) has a coefficient of -1.2713 under the world model. The t-statistics value is -3.73, significant at 1 % level. Also, the foreign profitability factor (FRMW) of the international model has a coefficient of -1.0394. The t-statistics value is -2.78, significant at 1 % level. During the Euro Zone Crisis, the foreign profitability factor (FRMW) of the international model in the Hong Kong stock market has a coefficient of -

3.2095. The t-statistics value is -2.69, significant at 1 % level. However, the profitability factor is insignificant in both the China and Taiwan stock markets during the Euro Zone Crisis. It appears that the cross sectional of stock return does not fully captured the profitability factor. The profitability (RMW) factor is therefore considered to be a semi-strong signal.

During the Global Financial Crisis, the investment factor (CMA) is insignificant statistically in the three stock markets of the Great China region. During the Euro Zone Crisis, the investment factor of the world model in the Hong Kong stock market has a coefficient of -0.5919. The t statistic value is -2.36, significant at 5% level. In addition, the domestic investment (DCMA) factor of the international model and domestic model has a coefficient of -0.9052 and -0.5084 respectively. The t-statistics values are -2.90 and -1.56, significant at 1% and 10% respectively. In the Taiwan stock market, the investment factor of the world model has a coefficient of -0.5158. The t statistic value is -2.62, significant at 1% level. Also, the foreign profitability factor (FCMA) has a coefficient of -0.4271. The t-statistics value is -2.53, significant at 5 % level. The investment (CMA) factor is considered to be a semi-strong signal as the cross sectional of stock return does not fully captured this factor.

The empirical evidences suggested that risk measures of the Fama and French Five Factor Model do not fully explain the value premium phenomenon in the context of market integration for the Greater China stock markets during the two major financial crises. These factors – market risk premium, SMB factor, HML factor, profitability factor and investment factor are considered to be semi-strong signals.

5.5.4 Global Financial Crisis - Comparion among (i)Banko, Conover and Jensen Model (2006), (ii) Fama and French Three Factor Model (1992, 1993) and (iii) Fama and French Five Factor Model (2015)

In this section, discussion is made on the comparison of the three models - (i) Banko, Conover and Jensen Model (2006), (ii) Fama and French Three Factor Model (1992, 1993) and (iii) Fama and French Five Factor Model (2015) in addressing the research objective for the Global Financial Crisis.

<u>Banko, Conover and Jensen Model (2006)</u>

For the Banko, Conover and Jensen Model (2006), industry book-to-market ratio is significant at 1 % level in the China and Hong Kong stock markets. In the case of the Hong Kong stock market, the industry book-to-market is significant at 1% level after controlling for market capitalisation and beta. In addition, the portfolio book-to-market ratio is significant at 1 % level in the Hong Kong and Taiwan stock markets. Market capitalisation is significant in both the China and Hong Kong stock markets, whereas, the beta is only significant in the China stock market. The adjusted R-squared of all the models in China, Hong Kong and Taiwan stock markets are in the range 0.68-0.69, 0.36-0.37 and 0.75 respectively.

Further analysis at the industrial level has revealed that industry book-to-market ratio is a more prominent factor than the portfolio book-to-market ratio in all the three stock markets of the Greater China region during the Global Financial Crisis. The variations in the size of the adjusted R-squared for the China, Hong Kong and Taiwan stock markets are in the range of -0.02 to 0.08, 0.04 to 0.17 and 0.07 to 0.20 respectively.

Overall Firm

The empirical results at the overall firm level shows that the market risk premium (MRP) factor is significant at 1% in the China stock market under both the models. The coefficient is negative. In addition, the SMB factor is significant in the Hong Kong stock market at 5% level under both the models. However, the SMB factor is significant at 10% and 5% respectively in the China stock market under the Fama and French Three Factor Model and Fama and French Five Factor Model respectively. Size effect is observed in the China stock market, as the coefficients are negative. As for the HML factor, it is significant in the Hong Kong stock market at 5% level under both the models. Furthermore, the HML factor is significant at 10% and 1% respectively in the Taiwan stock market under the Fama and French Three Factor Model and Fama and French Five Factor Model respectively. Growth effect is observed as the coefficient is negative. The profitability factor (CMA) is only significant at 10% level in the Taiwan stock market under the Fama and French Five Factor Model. The investment factor (CMA) is insignificant statistically in the three stock markets during the Global Financial Crisis.

Market Capitalisation

At the market capitalisation level, the market risk premium (MRP) factor is significant at 5% level in the small market capitalisation portfolios of the Hong Kong stock markets for the Fama and French Three Factor Model. However, the MRP factor is significant at 1% level in the big market capitalisation portfolios of the Hong Kong stock markets for the Fama and French Five Factor Model.

The SMB factor is significant at 1% and 5% levels respectively, in the small market capitalisation portfolios of the China stock markets under the Fama and French Three Factor Model and Fama and French Five Factor Model. Size effect is observed as the coefficient is negative. In addition, the SMB factor is significant at 1% level in both the small and big market capitalisation portfolios of the Taiwan stock markets under the

Fama and French Three Factor Model. However, the HML factor is significant at 1% level in the small market capitalisation portfolios of the China and Taiwan stock markets under the Fama and French Three Factor Model.

Under the Fama and French Five Factor Model, the profitability factor (RMW) is significant at 1% level only in the big market capitalisation of the Taiwan stock market. As for the investment factor (CMA), it is significant at 1% level in the big big market capitalisation of the Hong Kong and Taiwan stock markets.

Lastly, the adjusted R-squared values of the three stock markets are generally higher in the Fama and French Five Factor Model than the Fama and French Three Factor Model

Market Integration

At the market integration level, the foreign MRP factor (FMRP) of the international model is significant at 10% level in the Taiwan stock market under the Fama and French Three Factor Model. As for the Fama and French Five Factor Model, the domestic MRP factor (DMRP) of the international model is significant at 5% level in the China stock market.

The domestic SMB factor is significant in the international and domestic models of the China stock market under both Fama and French Three Factor Model and Fama and French Five Factor Model. In the Hong Kong stock market, the SMB factor of the world model and domestic model is significant under both the models. In the Taiwan stock market, the SMB factor of the world model is significant at 10% under Fama and French Three Factor Model.

The HML factor is significant at 1% level in the world, international and domestic models of the Hong Kong stock market under both the asset pricing models. Under the Fama and French Three factor Model, the domestic HML factor of the international model in the Taiwan stock market is significant at 5% level.

Under the Fama and French Five Factor Model, the profitability factor (RMW) is significant in the world and domestic models of the China stock market at 1% level. Furthermore, the foreign profitability factor (FRMW) of the international model is significant at 1 % level. In addition, the profitability factor (RMW) is significant in the world model of the Taiwan stock market at 1% level. The foreign profitability factor (FRMW) of the international model is significant at 1 % level for the Taiwan stock market.

The investment factor (CMA) of the China stock market is statistically significant at 10% for the domestic model. Also, the foreign investment factor (FCMA) of the international model of the Taiwan stock market is significant at 10 % level.

Lastly, the adjusted R-squared values of the three stock markets are generally higher in the Fama and French Five Factor Model than Fama and French Three Factor Model.

5.5 5 Euro Zone Crisis - Comparion among (i) Banko, Conover and Jensen Model (2006),(ii) Fama and French Three Factor Model (1992, 1993) and (iii) Fama and French Five Factor Model (2015)

In this section, discussion is made on the comparison of the three models - (i) Banko, Conover and Jensen Model (2006), (ii) Fama and French Three Factor Model (1992, 1993) and (iii) Fama and French Five Factor Model (2015) in addressing the research objective for the Euro Zone Crisis.

Banko, Conover and Jensen Model (2006)

For the Banko, Conover and Jensen Model (2006), portfolio book-to-market ratio is significant the Hong Kong stock markets, even after controlling for market capitalisation and beta. However, the industry book-to-market is insignificant statistically in the three stock markets of the Greater China region during the Euro Zone Crisis. The adjusted R-squared values of all the models in China, Hong Kong and Taiwan stock markets are extremely low.

Further analysis at the industrial level has revealed that portfolio book-to-market ratio is a marginally significant factor in the Hong Kong stock market, whereas beta is a marginally significant factor in the Taiwan stock market. The variations in the size of the adjusted R-squared for the China, Hong Kong and Taiwan stock markets are in the range of -0.02 to 0.08, 0.01 to 0.09 and -0.18 to 0.82 respectively.

Overall Firm

The empirical results at the overall firm level shows that the market risk premium (MRP) factor is significant at 1% in the China stock market under both the models, with positive coefficient. In addition, the market risk premium factor is significant at 1% and 5% in the Taiwan stock market under the Fama and French Three Factor Model and Fama and French Five Factor Model respectively, but with negative coefficient. The SMB factor is only significant at 1% level in the Taiwan stock market under the Fama and French Three Factor Model. Size effect is observed, as the coefficient is negative. Furthermore, the HML factor is insignificant statistically in the three stock markets of the Greater China region under both the models. Under the Fama and French Five Factor Model, the profitability factor (RMW) and investment factor (CMA) are is insignificant statistically in the three stock markets of the Greater China region.

Lastly, the adjusted R-squared values of the three stock markets are slightly higher in the Fama and French Five Factor Model than the Fama and French Three Factor Model.

Market Capitalisation

At the market capitalisation level, the market risk premium (MRP) factor is significant at 5% level in the small market capitalisation portfolios of the Hong Kong stock market under both the models. In addition, the market risk premium (MRP) factor is significant at 10% and 5% levels in the small market capitalisation portfolios of the Taiwan stock market respectively under the Fama and French Three Factor Model and Fama and French Five Factor Model. As for the big market capitalisation portfolios, , the market risk premium (MRP) factor is significant at 5% level in the Taiwan stock market respectively under the Fama and French Five Factor Model.

The SMB factor is significant in the small market capitalisation portfolios of the China and Taiwan stock markets under both the models. Size effect is observed, as the coefficients are negative. As for the big market capitalisation portfolios, the SMB factor is significant in the China stock market.

The HML factor is significant at 5% level in the small market capitalisation portfolios of the Hong Kong stock market under both the models. As for the big market capitalisation portfolios, the HML factor is significant at 1% level in the China stock market under both the models. In addition, the HML factor is also at 1% level in the big market capitalisation portfolios of the Hong Kong stock market under the Fama and French Three Factor Model.

Under the Fama and French Five Factor Model, the profitability factor (RMW) is significant at 1% level in both the small and big market capitalisation portfolios of the Taiwan stock market. As for the investment factor (CMA), it is significant at 1% level in both the small and big market capitalisation portfolios of the Taiwan stock market. The investment factor is also significant at 1% level in the small market capitalisation portfolios of the China stock markets.

Lastly, the adjusted R-squared values of the three stock markets are generally higher in the Fama and French Five Factor Model than the Fama and French Three Factor Model

Integration

At the market integration level, the market risk premium factor (FMRP) of the world and domestic models is significant at 1% level in the China stock market under both the Fama and French Three Factor Model and the Fama and French Five Factor Model. In addition, the foreign MRP factor (FMRP) of the international model is significant at 5% level in the China stock market under both the models. In the Taiwan stock market, the domestic market risk premium factor (DMRP) of the international model and domestic model is significant in the Taiwan stock market under both the Fama and French Three Factor Model and the Fama and French Five Factor Model.

The domestic SMB factor is significant at 1 % level in the international and domestic models of the Taiwan stock market under both Fama and French Three Factor Model and Fama and French Five Factor Model. In the Hong Kong stock market, the foreign SMB factor of the international model is significant at 1 % level under the Fama and French Five Factor Model.

The foreign HML factor (FHML) of the international model is significant at 1% level in the Hong Kong stock market under both Fama and French Three Factor Model and Fama and French Five Factor Model. In addition, the HML factor is significant at 5% and 1% levels in the world and domestic models of the Taiwan stock market. The foreign HML factor (FHML) of the international model in the Taiwan stock market is significant at 5% level.

Under the Fama and French Five Factor Model, the foreign profitability factor (RMW) of the international model is significant at 1% in the Hong Kong stock market.

During the Euro Zone Crisis, the investment factor of the world model in the Hong Kong stock market is significant at 5% level. In addition, the domestic investment (DCMA) factor of the international model and domestic model is significant at 1% and 10% respectively. In the Taiwan stock market, the investment factor of the world model is significant at 1% level. Also, the foreign profitability factor (FCMA) of the international model is significant at 5 % level. Lastly, the adjusted R-squared values of the three stock markets are generally higher in the Fama and French Five Factor Model than Fama and French Three Factor Model.

5.5.6. Comparison with literature

To the author's knowledge, this is the one of the first research that simultaneously examine do and to what extent the risk measures of the three asset pricing models in explaining the value premium phenomenon in an integrated stock markets setting during period of financial crises. Therefore, this work fills a research gap.

The research is different that the recent work of Barber et al. (2016) that studies which factors investors attend to by analysing mutual fund flows. In their research, four competing models of risks are considered: market-adjusted returns, the Capital Asset Pricing Model (CAPM), the Fama-French three-factor model and the Carhart four-factor model. The main finding shows that investors attend most to beta or market risk when evaluating funds. While the recent work of Barber et al. (2016) examines the issue in the context of diversified equity mutual funds that are actively managed over the period 1996 to 2012, this research studies the issue of value investing over the period December 2007 to June 2012, covering two major financial crises are highly volatile.

In addition, this research distinguished itself from the work of Trinh et al. (2016). Their work provides an empirical analysis on systematic risk determinants of stock return after financial crisis in the context of U.K. stock market. The main finding that excess market return (market risk premium) is the dominant variable among three risk factors, which is based on Fama and French Three Factor model, is different to this research. In this research, the excess market return (market risk premium) is a semi-strong signal. Despite this, it is argued that this research has added two additional risk factors – profitability factor (RMW) and investment factor (CMA), based on Fama and French Five Factor Model (2014).

Furthermore, the finding of this research also dissimilar with the original work of Banko, Conover and Jensen Model (2006). In the original paper, the result is that as far as the book-to market ratio is concerned the firm level effect is more prominent than the industry effect. However, the mixed evidence is observed. The difference may be caused by the period of investigation considered in these two works. The original work covers formation years of data from 1968 through 2000in the U.S. market, whilst the research consider Global Financial Crisis and Euro Zone Crisis under a two-period framework in the context of Great China stock markets.

On the question of whether risk based model can explain value premium phenomenon Phalippou (2006) has found that risk based models, such as Fama and French (1993), Lettau and Ludvingson (2001) as well Campbell and Vuolteenaho (2004), and Yogo (2005) are able to explain the cross section of returns of portfolios sorted on book-to-market ratio and size. However, these models are unable to capture the cross section of returns of portfolios sorted on book-to-market ratio and institutional ownership. The main difference between this research and the work of Phalippou (2006) is the investment horizon involved. The context in which this research examines is during financial crises.

5.6 Chapter Summary and Conclusions

"If I have seen further it is by standing on the shoulders of giants"

Sir Isaac Newton

The empirical analysis 1 in Chapter 4 has provided preliminary evidence and valid ground for the search of truth. With the aim to further improve the theory, the preliminary evidence leads to the research question in of "Do the risk factors explain value premium in the Greater China stock markets during two major financial crises?" in empirical analysis 2.

Based on the empirical results, analysis and discussions, the research has arrived at a number of main conclusions when addressing the research objective - "To examine do and to what extent the risk measures of (i) Banko, Conover and Jensen Model (2006), (ii) Fama and French Three Factor Model (1992, 1993) and (iii) Fama and French Five Factor Model (2014) explain the value premium in the Greater China stock markets during the Global Financial Crisis and Euro Zone Crisis."

Firstly, under the Banko, Conover and Jensen Model (2006) mixed results are observed. During the Global Financial Crisis, industry book-to-market ratio is a strong signal in the China and Hong Kong stock markets. In addition, the portfolio book-to-market ratio at the firm level is significant at 1 % level in the Hong Kong and Taiwan stock markets. Further analysis at the industrial level has revealed that industry book-to-market ratio is a more prominent factor than the portfolio book-to-market ratio at the firm level in all the three stock markets of the Greater China region during the Global Financial Crisis. Market capitalisation is significant in both the China and Hong Kong stock markets, whereas, the beta is only significant in the China stock market. During the Euro Zone Crisis, the firm level book-to-market ratio is significant the Hong Kong stock markets, even after controlling for market capitalisation and beta. However, the industry book-to-market is insignificant statistically in the three stock markets of the Greater China region.

Secondly, the study under the Fama and French Three Factor Model (1992, 1993) has shown that the three risk measures - market risk premium (MRP) factor, SMB factor and HML factor are semi-strong signals in explaining value premium in the Greater China stock markets during the two major financial crises.

Thirdly, the investigation under the Fama and French Five Factor Model (2014) has shed light that the five risk measures - market risk premium (MRP) factor, SMB factor, HML factor, profitability factor (RMW) and investment factor (CMA) are semi-strong signals in explaining value premium in the Greater China stock markets during the two major financial crises.

Fourthly, the adjusted R-squared values for the Fama and French Five Factor Model are higher than those of the Fama and French Three Factor Model.

Fifthly, considering the values of the adjusted R-squared and varying signals of the risk measures, it is suggested that risk factors of the three asset pricing models do not fully explain the value premium phenomenon in the Greater China stock markets during the two major financial crises.

The evidence of Empirical Analysis 2 is an important step forward in this journey for truth. With the recent development in the areas of noise, investor sentiment and volatility of the finance and accounting literatures, this research attempts to develop a noise-augmented asset pricing model in Empirical Analysis 3. Building upon the foundation of Fama and French Three Factor Model and Fama and French Five Factor Model, the noise-augmented asset pricing model reconciles risk based theory and behavioural finance quantitatively.

CHAPTER 6 – EMPIRICAL ANALYSIS 3

Noise augmented asset pricing models: evidence from the Greater China stock markets during two major financial crises

"The market can stay irrational longer than you can stay solvent."

John Maynard Keynes

6.1 Introduction

The concept of noise when trading and investing in the financial markets was introduced in a seminal work (Black, 1986). Noise is viewed as one of the factors which make the market to be somewhat inefficient. Model in the context of three different fields were proposed – finance, econometrics and macroeconomics. The author first explained noise trading in the financial markets as if it were information. Following from this, a theory of noise trading in the securities was developed (Trueman, 1988). The paper has presented a model where the manager of an investment fund is motivated for noise trading. De Long et al (1990) have brought the concept of noise a step further by proposing a model which contains noise traders and sophisticated investors. The noise is viewed as a source of risk when trading in financial markets. In addition, it is argued that the noise traders as a group, can earn a higher return than rational investors, as well as survive in the long run. These happened when the noise traders have portfolio allocation with incorrect expectations about return variances (De Long et al, 1991). Further empirical research conducted on the U.S. stock returns in the period 1871 – 1986, has revealed that it implied the asset prices respond not only to news, but also to noise trading or irrational demand in an investigation to question the predictability and volatility of stock return (Campbell et al, 1993). Against the background of standard finance model with unemotional investors, these developments have prompted an alternative proposal - the noise approach to finance, to the efficient market hypothesis (Shleifer and Summers, 1990). These authors' proposal is built on two assumptions. These two assumptions are the limit to arbitrage (Shleifer and Vishney, 1997) and the irrationality of some investors as well as their beliefs or sentiments which affect their demand for risk assets. On the sentiment of investors, the study on the relationship of volatility, sentiment and noise traders in the closed-end investment funds of U.S market has demonstrated strong evidence of relationship between individual sentiments and increased volatility (Brown, 1999). It is argued from the research that volatility, a representation of systematic risk and caused by the irrational investors in the noise trading, can affect asset prices and generate additional volatility. Barbel et al.(2009) further demonstrated that although the influence of one individual investor on asset prices is negligible, the buying and selling decisions of individuals are highly correlated. Furthermore, the buying and selling decisions cumulate over time. Therefore, the noise traders which consist of individual investors, could potentially affect asset prices because their noise is systematic.

Thus far, there are two schools of thought concerning the underlying explanations for the value premium phenomenon - risk based models and behavioral reasons. The rare occurrence of the Global Finance Crisis and Euro Zone Crisis have provided an appropriate and suitable context to reconcile volatility, as a proxy of the noise traders' risk in the financial market (De Long et al, 1990), with investor sentiments (Barberis et. al, 1998; Sheleifer, 2000; Baker and Wurgler, 2007) representing the behavior of investors. By constructing of noise augmented asset pricing models through examining the Greater China stock markets during two major financial crises, this research has contributed in filling the research gap. To the author's knowledge, this is one of the first attempts to quantitatively reconcile risk based models and behavioral school thought by developing parsimonious capital asset pricing models, in explaining the value premium phenomenon.

Against this background, the research objective of Empirical Analysis 3 is:

- To examine do and to what extent the investor sentiment measure and risk measures of (i) Fama and French Three Factor Model (1992, 1993) and (ii) Fama and French Five Factor Model (2014) explain the value premium in the Greater China stock markets during the Global Financial Crisis and Euro Zone Crisis.

6.2 The measure of noise – investor sentiment

The study on volatility, sentiment and noise traders in the closed-end investment funds of U.S market has demonstrated a strong evidence of relationship between individual sentiments and increased volatility. It is argued that volatility, a representation of systematic risk and caused by the irrational investors in the noise trading, can affect asset prices and generate additional volatility (Brown, 1999). Based on the proposition that investor sentiment is systematic and good proxy for noise in the behavioural finance (Barbel et al.,2009), the Fama and French Three Factor model (1992 &1993) and Fama and French Five Factor model (2015) are to be augmented in order to understand the impact of investor irrationality on the noise trader risk when examining the determinants of cross sectional stock returns during the Global Financial Crisis and Euro Zone Crisis.

The definition of investor sentiment found in Baker and Wurgler, 2007: 129 as "a belief about future cash flows and investment risk that is not justified by the facts at hand" , whereas Sheleifer, 2000, p12 described it as "…..reflects the common judgment errors made by a substantial number of investors, rather than uncorrelated random mistakes."

The measure of investor sentiment (INVSENT) is adapted based on the trading volume trend that is proposed by Baker & Stein (2004). The trading volume trend is defined as the change in trading volume per unit of time, which is the month-end trading volume divided by the trading volume of the previous month-end. In addition, Lee and Swaminathan (2000) also documented that past trading volume has provided an important link between "momentum" and "value" strategies.

The investor sentiment (INVSENT) factor is defined as

The difference between the return on a portfolio of high trading volume trend stocks and the return on a portfolio of low trading volume trend stocks.

6.3 Data Selection and Description of Data

The data for the Greater China stock markets, which comprise of China, Hong Kong and Taiwan stock markets are collected from the Data Stream Database. The data covers monthly firm's stock prices and firm's financial characteristics, such as price-to-book value, price-to-earning value, price-to-cash value, dividend yield, earnings per share, net tangible asset, assets per share, net debts, dividend per share, operating income, interest, number of shares and trading volumes. All data set are spanning from December 2007 to June 2012.

The stock market indices data are collected from Yahoo Finance spanning from December 2007 to June 2012. CSI 300 Index, which is a capitalization-weighted stock market index designed to replicate the performance of 300 stocks traded in the Shanghai and Shenzhen stock exchanges, is used for China stock markets. Hang Send Index and Taiwan Stock Exchange Weighted Index are used for Hong Kong and Taiwan stock markets respectively. Risk free rates data for China, Hong Kong and Taiwan are collected from CEIC Data for December 2007 to June 2012.

As the Dow Jones Industrial Average fell from the peak of 14,000 in October 2007 to just over 8,000, after a sharp decline of more than 40% in the early October 2008, this signifies the beginning of the global financial crisis. Alongside the Dow, major stock markets in other countries have plunged as well. According to the U.S. National Bureau of Economic Research (NBER), the recession ended in June 2009. In the context of this investigation, data from December 2007 to December 2010 are used for Global Financial

Crisis, covers a 36 months period. Whereas data from November 2009 to June 2012 are used for Euro Zone Crisis, cover a 32 months period.

The data set consists of 1,321, 1,128 and 1,409 companies listed on the China, Hong Kong and Taiwan stock markets respectively (the population size). However, some 106, 386 and 405 companies of the China, Hong Kong and Taiwan stock markets are excluded from the analysis due to various reasons such as delisting, incomplete data and listed after the "formation period" for the value and growth stocks classification

6.4 Methodology

The methodological approach adopted in this thesis derived from the theoretical framework described in the Chapter 3.

6.4.1. Noise augmented asset pricing model (based on Fama and French Three Factor Model)

These portfolios are constructed as per described in the Chapter 5, Section 5.3.2. Methodology - Fama and French Three Factor Model (1992, 1993). The portfolios are formed based on three main groupings – overall firm, market capitalization and stock market integration (Griffin, 2002).

The investigation on the risk based explanation followed the three factor model as proposed by Fama and French (1993). The three factor models are the market return in excess of the risk-free rate (Market Risk Premium, MRP = Rm-Rf), the difference between the returns on small and big capitalisation portfolios (SMB, small minus big), and the difference between the returns on high and low book-to-market portfolios (HML, high minus low).

By running regression analysis on monthly cross section time series data (panel data), coefficient is estimated from

$$R_{it} = \alpha_i + \beta_i(Rm_t - Rf_t) + \varpi_i SMB_t + \theta_i HML_t + \rho INVSENT_t + \nu_{it} \quad (8)$$

The definitions of the variables in the Fama and French (1992, 1993) three factor model are as follows:-

(a) R_{it} Firm stock returns (Rit) in terms of excess return have calculated as follows:-

$$R_{it} = [\{(P_{it} - P_{i,t-1}) / P_{i,t-1}\} + DY_{it}] - Rf_t$$

Where P_{it} is a closing stocks price at month-end for firm *i* at time t and DY_{it} is the dividend yield firm *i* at year–end at time t and R_f is a risk-free asset proxy by the relevant twelve months Treasury bill rate. DY_{it} , however, is excluded from the calculations of R_{it} , as its magnitude is relatively insignificant as compared to changes in the closing stock prices $(P_{pt} - P_{i,t-1})$.

(b) The market return is proxies by the return of stock market indices of the relevant Stock Exchanges (HSI). The exchange market return is expressed in terms of excess returns as follows:-

$$Rm_t = [\{(HS_t - HS_{t-1}) / HS_{t-1}\}] - Rf_t$$

(c) Small minus big (SMB)

The difference between the return on a portfolio of small market capitalisation stocks and the return on a portfolio of big market capitalisation stocks.

(d) High minus low (HML)

The difference between the return on a portfolio of high book-to-market stocks and the return on a portfolio of low book-to-market stocks.

In the regression analysis, this research uses ordinary least squares approach of a cross sectional, time-series setting. Petersen (2009) argues that in the data seta of the panel data, the residuals may be correlated across firms or across time. Therefore, the OLS standard errors can be biased. The author examined the different methods used in the literature and explained when the different methods yield the same and correct standard errors and when they diverge. He has proposed techniques for estimating standard errors in the presence of a fixed firm effect (CL-F), a time effect (CL-T) as well as a fixed firm and time effect (CL – F&T)

<u>*Griffin (2002) – Market Integration*</u>

$$\begin{aligned} R_{it} &= \alpha_i + \beta_{Di} W_{Dt} D(Rm_t - Rf_t) + \omega_{Di} W_{Dt} DSMB_t + \theta_{Di} W_{Dt} DHML_t + \\ &\beta_{Fi} W_{Ft} (Rm_t - Rf_t) + \varpi_{Fi} W_{Ft} FSMB_t + \theta_{Fi} W_{Ft} FHML_t + \rho_{Di} W_{Dt} DINVSENT_t \\ &+ \rho_{Fi} W_{Ft} FINVSENT_t + \nu_{it} \end{aligned} \quad (9)$$

6.4.2. Noise augmented asset pricing model (based on Fama and French Five Factor Model)

These portfolios are constructed as per described in the preceding section and Chapter 5, Section 5.3.3. Methodology- Fama and French Five Factor Model (2015). The portfolios are formed based on three main groupings – overall / firm, market capitalization and stock market integration (Griffin, 2002). Portfolios are reformed on an annual basis. Petersen (2009) argues that in the data seta of the panel data, the residuals may be correlated across firms or across time. Therefore, the OLS standard errors can be biased. The author examined the different methods used in the literature and explained when the different methods yield the same and correct standard errors and when they diverge. He has proposed techniques for estimating standard errors in the presence of a fixed firm effect (CL-F), a time effect (CL-T) as well as a fixed firm and time effect (CL – F&T)

The investigation on the risk based explanation followed the three factor model as proposed by Fama and French (1993). In addition to the three factors - MRP (market risk premium factor), SMB (size factor) and HML (book-to-market factor), the other two new factors in the Fama and French Five Factor Model (2015) are RMW (profitability factor) and CMA (investment factor) respectively.

By running of analysis on monthly cross section time series data (panel data), coefficient is estimated from

$$R_{it} = \alpha_i + \beta_i (Rm_t - Rf_t) + \varpi_i SMB_t + \theta_i HML_t + \kappa_i RMW_t + \lambda_i CMA_t + \rho INVSENT_t + \nu_{it} \tag{10}$$

The definitions of the new variables in the Fama and French (2014) five factor model are as follows:-

(a) Robust minus weak (RMW)

The difference between the returns on diversified portfolios of stocks with robust and weak profitability.

(b) Conservative minus aggressive (CMA)

The difference between the returns on diversified portfolios of low and high investment firms.

Similar to the discussion above, this research uses ordinary least squares approach of a cross sectional, time-series setting.

<u>*Griffin (2002) – Market Integration*</u>

$$\begin{aligned} R_{it} &= \alpha_i + \beta_{Di} W_{Dt} D(Rm_t - Rf_t) + \omega_{Di} W_{Dt} DSMB_t + \theta_{Di} W_{Dt} DHML_t + \\ &\kappa_{Di} W_{Dt} DRMW_t + \lambda_{Di} W_{Dt} DCMA_t + \beta_{Fi} W_{Ft} F(Rm_t - Rf_t) + \varpi_{Fi} W_{Ft} FSMB_t \\ &+ \theta_{Fi} W_{Ft} FHML_t + \kappa_{Fi} W_{Ft} FRMW_t + \lambda_{Fi} W_{Ft} FCMA_t + \rho_{Di} W_{Dt} DINVSENT_t + \\ &\rho_{Fi} W_{Ft} FINVSEMT_t + \nu_{it} \end{aligned} \tag{11}$$

6.5 Empirical Results and Analysis – China, Hong Kong and Taiwan Stock Markets

The measure of noise for behavioural finance is investor sentiment (INVSENT) factor. As for the Fama and French Three Factor Model (1992, 1993), the risk measures are MRP (market risk premium factor), SMB (size factor) and HML (book-to-market factor). Whereas, the Fama and French Five Factor Model (2015) comprises of two additional risk measures - RMW (profitability factor) and CMA (investment factor). The

Similar to Chapter 5, it is suggested that signal for the measures can be classified as strong, semi-strong and weak, similar to strong form, semi-strong form and weak form of efficiency. The proposed signal classification is based on a two-period framework. It is proposed that the classification of the signal is based on three main criteria – level of significance, coverage and sign of the coefficient – positive or negative.

The level of significance is considered as follows:-

4. Significant - at 1% t-statistical significance
5. Marginally significant - at 5% t-statistical significance
6. Weakly significant - at 10% t-statistical significance

The coverage may include number of stock markets, market capitalisation issue or number of sample industries**.**

6.5.1. Noise augmented asset pricing model (based on Fama and French Three Factor Model)

Overall Firm

Table 29 reports the summary statistics for each of the factors. Panel A and Panel B show monthly mean, standard deviation and t-mean (ratio of the mean to its standard error) statistics for each factor for Global Financial Crisis and Euro Zone Crisis respectively.

The market risk premium / excess market return factor shows significant t-statistics for China, Hong Kong and Taiwan stock markets during the Global Financial Crisis and Euro Zone Crisis. In addition, the SMB factor is marginally significant in Hong Kong stock market during the Global Financial Crisis and Euro Zone Crisis.

Table 29 Noised-Augmented Asset Pricing Model (based on Three Factor Model)
Summary Statistics - Averages, standard deviations and t-statistics for month returns

Panel A: Global Financial Crisis

	China				Hong Kong			
	Rm- Rf	SMB	HML	INVSENT	Rm- Rf	SMB	HML	INVSENT
Mean	0.0467***	0.0111**	0.0058	-0.0108	0.0556***	1.0528**	-0.0267	-0.0103
Std dev	0.0138	0.0247	0.0348	0.0503	0.0164	2.8525	0.6192	0.0701
t-Statistic	(17.6)	(2.2)	(0.8)	(-0.9)	(16.7)	(1.8)	(-0.2)	(-0.7)
	Taiwan							
	Rm- Rf	SMB	HML	INVSENT				
Mean	0.0633***	0.0264	-0.0381	-0.0017				
Std dev	0.0091	0.0862	0.1234	0.0489				
t-Statistic	(34.7)	(1.5)	(-1.5)	(-0.1)				

Panel B: Euro Zone Crisis

	China				Hong Kong			
	Rm- Rf	SMB	HML	INVSENT	Rm- Rf	SMB	HML	INVSENT
Mean	0.0613***	-0.0010	0.0003	0.0003	0.0584***	0.0294**	0.0190	0.0000
Std dev	0.0162	0.0585	0.0325	0.0337	0.0144	0.0744	0.0614	0.0909
t-Statistic	(18.9)	(0.0)	(0.0)	(0.0)	(20.2)	(1.9)	(1.5)	(0.0)
	Taiwan							
	Rm- Rf	SMB	HML	INVSENT				
Mean	0.0677***	0.0087*	0.0010	0.0003				
Std dev	0.0066	0.0249	0.0324	0.0353				
t-Statistic	(51.2)	(1.7)	(0.1)	(0.0)				

Table 29 reports the summary statistics for each of the factors. Panel A and Panel B show monthly mean, standard deviation and t-mean (ratio of the mean to its standard error) statistics for each factor for Global Financial Crisis and Euro Zone Crisis respectively. Rm- Rf (MRP) is the market return in excess of the risk-free rate (Market Risk Premium), small minus big (SMB) is the difference between the return on a portfolio of small market capitalisation stocks and the return on a portfolio of big market capitalisation stocks, high minus low (HML) is the difference between the return on a portfolio of high book-to-market stocks and the return on a portfolio of low book-to-market stocks and investor sentiment (INVSENT) is the difference between the return on a portfolio of high trading volume trend stocks and the return on a portfolio of low trading volume trend stocks.

Table 30 shows the regression results of monthly portfolio returns on market risk premium/ excess market return (MRP), market capitalisation (SMB), book-to-market (HML)) and Investor Sentiment (INVSENT). Coefficients (t-statistics) are presented from the OLS using monthly cross section time series data for China, Hong Kong and Taiwan stock markets during Global Financial Crisis and Euro Zone Crisis. OLS regressions are presented for each of the stock market, where a separate regression is estimated for each of them. The standard errors are estimated in the presence of a fixed firm effect (CL-F), a time effect (CL-T) and a fixed firm and time effect (CL – F&T).For full results, please see Appendix E.

Table 30 Regression Results of Monthly Portfolio Returns on Market Risk Premium / Excess Market Return (MRP), Market Capitalisation (SMB), Book-to-Market (HML) and Investor Sentiment (INVSENT) Panel – OLS (Estimating Standard Errors in the Presence of a Fixed Firm and/or Time Effect)

Panel A: Global Financial Crisis

	MRP		SMB		HML		INVSENT		Adjusted R-Squared	Std-Errors
China	-0.8611 (-0.57)		-2.1525 (-1.93)	*	-0.2281 (-0.28)		0.2665 (0.65)		0.1475	CL-T
Hong Kong	-		0.0028 (1.97)	**	-0.0829 (-9.39)	***	-		0.5738	CL-F&T
Taiwan	-5.0914 (-2.78)	***	-0.5292 (-1.28)		-0.7029 (-2.66)	***	-0.2652 (-0.62)		0.0814	CL-T

Panel B: Euro Zone Crisis

Stock Market	MRP		SMB		HML		INVSENT		Adjusted R-Squared	Std-Errors
China	18.8987 (6.23)	***	0.4015 (0.96)		-0.3755 (-0.16)		1.0961 (0.63)		0.3597	CL-T
Hong Kong	-1.1235 (-1.31)		0.0920 (0.36)		-0.1356 (-0.58)		0.2724 (2.51)	**	0.0592	CL-T
Taiwan	-5.0180 (-2.39)	**	-0.6910 (-1.15)		-0.0941 (0.20)		0.3281 (0.75)		0.2035	CL-T

*Note: Values in the parentheses are the t-statistics. *, **, *** significant at 10%, 5%, 1% respectively.*

Table 30 shows the regression results of monthly portfolio returns on market risk premium (MRP), market capitalisation (SMB), book-to-market (HML)) and Investor Sentiment (INVSENT). Coefficients (t-statistics) are presented from the OLS using monthly cross section time series data for China, Hong Kong and Taiwan stock markets during Global Financial Crisis and Euro Zone Crisis. OLS regressions are presented for each of the stock market, where a separate regression is estimated for each of them. The standard errors are estimated in the presence of a fixed firm effect (CL-F), a time effect (CL-T) and a fixed firm and time effect (CL – F&T).

The market risk premium/ excess market return factor exhibits significant and marginally significant negative t-statistics for Taiwan stock market during the Global Financial Crisis and Euro Zone Crisis. In addition, the China stock market exhibits positive coefficient for market risk premium during the Euro Zone Crisis

The SMB factor is weakly and marginally significant for the China and Hong Kong stock markets during the Global Financial Crisis. However, the SMB factor is insignificant in the three stock markets during Euro Zone Crisis.

The HML factor is significant in China and Hong Kong stock markets during the Global Financial Crisis. Growth effect is observed in both the markets, as the coefficient is negative. However, the HML factor is insignificant in the three stock markets during Euro Zone Crisis.

During the Euro Zone Crisis, the INVSENT factor is marginally significant in the Hong Kong stock market.

The adjusted R-squared for the China, Hong Kong and Taiwan stock markets are 0.15, 0.57 and 0.08 respectively during the Global Financial Crisis. During the Euro Zone Crisis, the adjusted R-squared changes to 0.36, 0.06 and 0.20 respectively.

Market Capitalisation

Table 31 reports the summary statistics for each of the factors. The summary statistics are monthly mean, standard deviation and t-mean (ratio of the mean to its standard error) statistics for each factor for Global Financial Crisis and Euro Zone Crisis respectively. Panel A and Panel B report the summary statistics of small market capitalisation and big market capitalisation portfolios during Global Financial Crisis. Panel C and Panel D report the summary statistics of small market capitalisation and big market capitalisation portfolios during Euro Zone Crisis

Only the market risk premium / excess market return has shown significant t-statistics for small and big capitalisation portfolios of China, Hong Kong and Taiwan stock markets during the Global Financial Crisis and Euro Zone Crisis.

Table 31 Noised-Augmented Asset Pricing Model (based on Three Factor Model)
- Market Capitalisation
Summary Statistics - Averages, standard deviations and t-statistics for month returns

Panel A: Global Financial Crisis - Small Cap

	China				Hong Kong			
	Rm- Rf	SMB	HML	INVSENT	Rm- Rf	SMB	HML	INVSENT
Mean	0.0467***	0.0144	0.0339	-0.0108	0.0556***	0.0636	-0.0872	-0.0103
Std dev	0.0138	0.0497	0.1025	0.0504	0.0165	0.1156	0.1205	0.0703
t-Statistic	(7.5)	(0.6)	(0.7)	(-0.4)	(7.5)	(1.2)	(-1.6)	(-0.3)

	Taiwan			
	Rm- Rf	SMB	HML	INVSENT
Mean	0.0507***	0.0864	-0.0922	-0.0017
Std dev	0.0267	0.3831	0.3772	0.0490
t-Statistic	(4.2)	(0.5)	(-0.5)	(0.0)

Panel B: Global Financial Crisis - Big Cap

	China				Hong Kong			
	Rm- Rf	SMB	HML	INVSENT	Rm- Rf	SMB	HML	INVSENT
Mean	0.0467***	0.0139	-0.0031	-0.0108	0.0556***	0.0047	-0.0231	-0.0103
Std dev	0.0138	0.0449	0.0453	0.0504	0.0165	0.1339	0.0720	0.0703
t-Statistic	(7.5)	(0.6)	(-0.1)	(-0.4)	(7.5)	(0.0)	(-0.7)	(-0.3)

	Taiwan			
	Rm- Rf	SMB	HML	INVSENT
Mean	0.0507***	-0.0022	-0.0158	-0.0017
Std dev	0.0267	0.0492	0.0387	0.0490
t-Statistic	(4.2)	(0.0)	(-0.8)	(0.0)

Panel C: Euro Zone Crisis - Small Cap

	China				Hong Kong			
	Rm- Rf	SMB	HML	INVSENT	Rm- Rf	SMB	HML	INVSENT
Mean	0.0600***	0.0106	0.0035	-0.0006	0.0584***	0.0548	-0.0506	0.0000
Std dev	0.0160	0.0298	0.0372	0.0333	0.0144	0.1526	0.0741	0.0911
t-Statistic	(8.3)	(0.7)	(0.2)	(0.0)	(9.0)	(0.8)	(-1.5)	(0.0)

	Taiwan			
	Rm- Rf	SMB	HML	INVSENT
Mean	0.0677***	0.0197	0.0023	0.0003
Std dev	0.0066	0.0560	0.0452	0.0354
t-Statistic	(22.9)	(0.7)	(0.1)	(0.0)

Panel D: Euro Zone Crisis - Big Cap

	China				Hong Kong			
	Rm- Rf	SMB	HML	INVSENT	Rm- Rf	SMB	HML	INVSENT
Mean	0.0600***	0.0071	-0.0090	-0.0006	0.0584***	0.0213	0.0097	0.0000
Std dev	0.0160	0.0453	0.0515	0.0333	0.0144	0.0782	0.1367	0.0911
t-Statistic	(8.3)	(0.3)	(-0.3)	(0.0)	(9.0)	(0.6)	(0.1)	(0.0)

	Taiwan			
	Rm- Rf	SMB	HML	INVSENT
Mean	0.0677***	-0.0032	-0.0003	0.0003
Std dev	0.0066	0.0258	0.0341	0.0354
t-Statistic	(22.9)	(-0.2)	(0.0)	(0.0)

Table 31 reports the summary statistics for each of the factors. The summary statistics are monthly mean, standard deviation and t-mean (ratio of the mean to its standard error) statistics for each factor for Global Financial Crisis and Euro Zone Crisis respectively. Panel A and Panel B report the summary statistics of small market capitalisation and large market capitalisation portfolios during Global Financial Crisis. Panel C and Panel D report the summary statistics of small market capitalisation and large market capitalisation portfolios during Euro Zone Crisis. Rm- Rf (MRP) is the market return in excess of the risk-free rate (Market Risk Premium), small minus big (SMB) is the difference between the return on a portfolio of small market capitalisation stocks and the return on a portfolio of big market capitalisation stocks and high minus low (HML) is the difference between the return on a portfolio of high book-to-market stocks, the return on a portfolio of low book-to-market stocks and investor sentiment (INVSENT) is the difference between the return on a portfolio of high trading volume trend stocks and the return on a portfolio of low trading volume trend stocks.

Table 32 shows the regression results of monthly portfolio returns on market risk premium (MRP), market capitalisation (SMB), book-to-market (HML) and investor sentiment (INVSENT). Panel A and Panel B report the regression results of small market capitalisation and big market capitalisation portfolios during Global Financial Crisis. Panel C and Panel D report the regression results of small market capitalisation and big market capitalisation portfolios during Euro Zone Crisis. The standard errors are estimated in the presence of a fixed firm effect (CL-F), a time effect (CL-T) and a fixed firm and time effect (CL – F&T).For full results, please see Appendix E.

During the Global Financial Crisis, the market risk premium / excess market return factor has significant negative coefficients in the small market capitalisation portfolios of the Hong Kong stock market. During the Euro Zone Crisis, the market risk premium factor has significant negative coefficients in the small capitalisation portfolios of the Hong Kong and Taiwan stock markets. In addition, the big capitalisation portfolios of the Taiwan stock markets have a negative coefficient.

During the Global Financial Crisis, the SMB factor is significant for the small market capitalisation portfolios of the China stock market. Size effect is observed, as the coefficient is negative. In addition, the big market capitalisation portfolios of Taiwan stock market have a positive significant SMB factor. During the Euro Zone Crisis, the small market capitalisation portfolios of the China and Taiwan stock markets are marginally significant and significant respectively. Size effect is observed, as both the markets have negative coefficients.

During the Global Financial Crisis, the HML factor is positively significant for the small market capitalisation portfolios of the China stock market. During the Euro Zone Crisis, the HML factor is marginally significant for the small market capitalisation portfolios of the Hong Kong stock market. In addition, the HML factor is positively significant for the big market capitalisation portfolios of the China and Hong Kong stock markets.

The INVSENT factor is only significant and marginally significant in the small and big market capitalisation portfolios of the Hong Kong stock markets during the Euro Zone Crisis.

During the Global Financial Crisis, the adjusted R-squared for the small market capitalisation of the China, Hong Kong and Taiwan stock markets are 0.19, 0.10 and 0.41 respectively. Whereas, the adjusted R-squared for the big market capitalization are 0.00, 0.05 and -0.24. On the other hand, the adjusted R-squared for the small market capitalisation of the China, Hong Kong and Taiwan stock markets are 0.35, 0.24 and 0.30 respectively during Euro Zone Crisis. The adjusted R-squared for the big market capitalisation are 0.19, 0.23 and -0.17.

Table 32

Regression Results of Monthly Portfolio Returns on Market Risk Premium / Excess Market Return (MRP), Market Capitalisation (SMB), Book-to-Market (HML) and Investor Sentiment (INVSENT) – Market Capitalisaton Panel – OLS (Estimating Standard Errors in the Presence of a Fixed Firm and/or Time Effect)

Panel A: Global Financial Crisis - Small Cap

Stock Market	MRP		SMB		HML		INVSENT	Adjusted R-Squared	Std-Errors
China	-0.3942 (-0.27)		-1.1461 (-2.75)	***	0.3929 (3.45)	***	0.2387 (0.99)	0.1867	CL-T
Hong Kong	-2.1796 (-2.11)	**	-0.0042 (-0.01)		-0.17 (-0.63)		0.1877 (0.74)	0.0954	CL-T
Taiwan	0.4695 (1.31)		0.2724 (1.20)		-		-	0.4089	CL - F & T

Panel B: Global Financial Crisis - Big Cap

Stock Market	MRP	SMB	HML	INVSENT	Adjusted R-Squared	Std-Errors
China	-0.4005	0.2676	0.0211	0.0987	-0.0073	CL-T
	(-0.25)	(0.45)	(0.03)	(0.43)		
Hong Kong	-1.4789	-0.0514	0.3066	0.2398	0.0529	CL-T
	(-1.04)	(-0.24)	(0.79)	(0.82)		
Taiwan	-0.2232	1.1725 ***	-0.5447	-0.1506	0.2393	CL-T
	(-0.92)	(3.75)	(-1.29)	(-0.43)		

Panel C: Euro Zone Crisis - Small Cap

Stock Market	MRP	SMB	HML	INVSENT	Adjusted R-Squared	Std-Errors
China	0.0543	-1.2493 **	-0.3838	-0.1780	0.3462	CL-T
	(0.09)	(-2.32)	(-1.00)	(-0.71)		
Hong Kong	-1.6286 **	0.0082	-0.2982 **	0.3686 ***	-0.2400	CL-T
	(-2.29)	(0.11)	(-2.37)	(2.81)		
Taiwan	-4.4247 **	-0.5422 ***	0.1260	0.2011	0.2982	CL-T
	(-1.96)	(-2.80)	(0.44)	(0.51)		

Panel D: Euro Zone Crisis - Big Cap

Stock Market	MRP	SMB	HML	INVSENT	Adjusted R-Squared	Std-Errors
China	-0.1707	0.619 ***	0.6484 ***	-0.0925	0.1895	CL-T
	(-0.32)	(2.91)	(4.31)	(-0.32)		
Hong Kong	-0.8439	0.0404	0.2962 ***	0.1925 **	0.2278	CL-T
	(-0.91)	(0.19)	(3.27)	(1.99)		
Taiwan	-3.5789 ***	0.5123 **	-0.2192	0.2662	-0.1672	CL-T
	(-3.81)	(2.04)	(-1.14)	(1.54)		

Note: Values in the parentheses are the t-statistics. *, **, *** significant at 10%, 5%, 1% respectively.

Table 32 shows the regression results of monthly portfolio returns on market risk premium (MRP), market capitalisation (SMB), book-to-market (HML) and investor sentiment (INVSENT). Panel A and Panel B report the regression results of small market capitalisation and big market capitalisation portfolios during Global Financial Crisis. Panel C and Panel D report the regression results of small market capitalisation and big market capitalisation portfolios during Euro Zone Crisis. Coefficients (t-statistics) are presented from the OLS using monthly cross section time series data for China, Hong Kong and Taiwan stock markets during Global Financial Crisis and Euro Zone Crisis. OLS regressions are presented for each of the stock market, OLS regressions are presented for each of the stock market, where a separate regression is estimated for each of the small or big market capitalization portfolio. The standard errors are estimated in the presence of a fixed firm effect (CL-F), a time effect (CL-T) and a fixed firm and time effect (CL – F&T).

Integration

Table 33 reports the summary statistics for each of the factors. The summary statistics are monthly mean, standard deviation and t-mean (ratio of the mean to its standard error) statistics for each factor for Global Financial Crisis and Euro Zone Crisis respectively. Panel A and Panel B report the summary statistics of the China, Hong Kong and Taiwan stock market under the world model during the Global Financial Crisis and Euro Zone Crisis respectively.

Table 33 Noised-Augmented Asset Pricing Model (based on Three Factor Model) – Integration
Summary Statistics - Averages, standard deviations and t-statistics for month returns – World Model

Panel A: Global Financial Crisis - World

	China / Hong Kong / Taiwan			
	WRm- Rf	WSMB	WHMLW	WINVSENT
Mean	0.0525 ***	0.3908 *	-0.0083	-0.0086
Std dev	0.0112	1.0466	0.2320	0.0364
t-Statistic	(23.2)	(1.8)	(-0.1)	(-1.0)

Panel B: Euro Zone Crisis - World

	China / Hong Kong / Taiwan			
	WRm- Rf	WSMB	WHML	WINVSENT
Mean	0.0610 ***	0.0094	0.0068	0.0013
Std dev	0.0130	0.0340	0.0295	0.0362
t-Statistic	(23.2)	(1.3)	(1.1)	(0.10)

Table 33 reports the summary statistics for each of the factors. The summary statistics are monthly mean, standard deviation and t-mean (ratio of the mean to its standard error) statistics for each factor for Global Financial Crisis and Euro Zone Crisis respectively. Panel A and Panel B report the summary statistics of the China, Hong Kong and Taiwan stock market under the world model during the Global Financial Crisis and Euro Zone Crisis respectively. WRm- Rf (WMRP) is the market return in excess of the risk-free rate of the world model (Market Risk Premium), small minus big (WSMB) is the difference between the return on a portfolio of small market capitalisation stocks and the return on a portfolio of big market capitalisation stocks of the world model, high minus low (WHML) is the difference between the return on a portfolio of high book-

to-market stocks and the return on a portfolio of low book-to-market stocks of the world model and investor sentiment (WINVSENT) is the difference between the return on a portfolio of high investor trading trend stocks and the return on a portfolio of low trading volume trend stocks of the world model.

Table 34 reports the summary statistics for each of the factors. The summary statistics are monthly mean, standard deviation and t-mean (ratio of the mean to its standard error) statistics for each factor for Global Financial Crisis and Euro Zone Crisis respectively. Panel A and Panel B report the summary statistics of the China, Hong Kong and Taiwan stock market under the international model during the Global Financial Crisis and Euro Zone Crisis respectively.

Table 34 Noised-Augmented Asset Pricing Model (based on Three Factor Model) – Integration Summary Statistics - Averages, standard deviations and t-statistics for month Returns – International Model

Panel A: Global Financial Crisis - International

	China							
	DRm-Rf	DSMB	DHML	DINVSENT	FRm-Rf	FSMB	FHML	FINVSENT
Mean	0.0247***	0.0061**	0.0036	-0.0064	0.0267***	0.3861*	-0.0117	-0.0039
Std dev	0.0069	0.0119	0.0187	0.0276	0.0078	1.0452	0.2289	0.0268
t-Statistic	(17.8)	(2.5)	(0.9)	(-1.0)	(17.1)	(1.8)	(-0.2)	(-0.5)
	Hong Kong							
	DRm- Rf	DSMB	DHML	DINVSENT	FRm- Rf	FSMB	FHML	FINVSENT
Mean	0.0211***	0.3833*	-0.0078	-0.0036	0.0319***	0.0092***	-0.0003	-0.0056
Std dev	0.0057	1.0471	0.2282	0.0243	0.0084	0.0171	0.0228	0.0273
t-Statistic	(18.5)	(1.8)	(-0.1)	(-0.6)	(18.9)	(2.6)	(0.0)	(-0.9)
	Taiwan							
	DRm- Rf	DSMB	DHML	DINVSENT	FRm- Rf	FSMB	FHML	FINVSENT
Mean	0.0100	0.0025	-0.0033	-0.0080***	0.0045**	0.3878*	-0.0053	-0.0092
Std dev	0.0000	0.0092	0.0135	0.0049	0.0112	1.0476	0.2312	0.0349
t-Statistic	(0.0)	(1.3)	(-1.1)	(-8.1)	(2.0)	(1.8)	(-0.1)	(-1.2)

Panel B: Euro Zone Crisis - International

	China							
	DRm- Rf	DSMB	DHML	DINVSENT	FRm- Rf	FSMB	FHML	FINVSENT
Mean	0.0319***	-0.0013	0.0006	0.0000	0.0274 ***	0.0113**	0.0071	-0.0045
Std dev	0.0074	0.0323	0.0180	0.0182	0.0062	0.0276	0.0230	0.0268
t-Statistic	(21.5)	(-0.1)	(0.1)	(0.0)	(22.0)	(2.0)	(1.5)	(-0.7)
	Hong Kong							
	DRm- Rf	DSMB	DHML	DINVSENT	FRm- Rf	FSMB	FHML	FINVSENT
Mean	0.0219***	0.0103**	0.0071	0.0010	0.0390***	0.0000	-0.0003	0.0000
Std dev	0.0059	0.0262	0.0226	0.0323	0.0100	0.0315	0.0179	0.0174
t-Statistic	(18.5)	(1.9)	(1.5)	(0.1)	(19.5)	(0.0)	(0.0)	(0.0)

	Taiwan							
	DRm- Rf	DSMB	DHML	DINVSENT	FRm- Rf	FSMB	FHML	FINVSENT
Mean	0.0098***	0.0006	0.0003	0.0000	0.0529***	0.0087	0.0065	0.0010
Std dev	0.0018	0.0025	0.0031	0.0044	0.0140	0.0325	0.0290	0.0350
t-Statistic	(27.2)	(1.1)	(0.4)	(0.0)	(18.8)	(1.3)	(1.1)	(0.1)

Table 34 reports the summary statistics for each of the factors. The summary statistics are monthly mean, standard deviation and t-mean (ratio of the mean to its standard error) statistics for each factor for Global Financial Crisis and Euro Zone Crisis respectively. Panel A and Panel B report the summary statistics of the China, Hong Kong and Taiwan stock market under the international model during the Global Financial Crisis and Euro Zone Crisis respectively. DRm- Rf (DMRP) is the market return in excess of the risk-free rate of the domestics model (Market Risk Premium), small minus big (DSMB) is the difference between the return on a portfolio of small market capitalisation stocks and the return on a portfolio of big market capitalisation stocks of the domestics model, high minus low (DHML) is the difference between the return on a portfolio of high book-to-market stocks and the return on a portfolio of low book-to-market stocks of the domestics model and investor sentiment (DINVSENT) is the difference between the return on a portfolio of high trading volume trend stocks and the return on a portfolio of low trading volume trend stocks of the domestics model. FRm- Rf (FMRP) is the market return in excess of the risk-free rate of the foreign element in the international model (Market Risk Premium), small minus big (FSMB) is the difference between the return on a portfolio of small market capitalisation stocks and the return on a portfolio of big market capitalisation stocks of the foreign element in the international model , high minus low (FHML) is the difference between the return on a portfolio of high book-to-market stocks and the return on a portfolio of low book-to-market stocks of the foreign element in the international model and investor sentiment (FINVSENT) is the difference between the return on a portfolio of high trading volume trend stocks and the return on a portfolio of low trading volume trend stocks of the foreign element in the international model.

Table 35 reports the summary statistics for each of the factors. The summary statistics are monthly mean, standard deviation and t-mean (ratio of the mean to its standard error) statistics for each factor for Global Financial Crisis and Euro Zone Crisis respectively. Panel A and Panel B report the summary statistics of the China, Hong Kong and Taiwan stock market under the domestic model during the Global Financial Crisis and Euro Zone Crisis respectively.

Table 35 Noised-Augmented Asset Pricing Model (based on Three Factor Model) – Integration
Summary Statistics - Averages, standard deviations and t-statistics for month returns – Domestic Model

Panel A: Global Financial Crisis - Domestics

	China			
	DRm- Rf	DSMB	DHML	DINVSENT
Mean	0.0247 ***	0.0061 **	0.0036	-0.0064
Std dev	0.0069	0.0119	0.0187	0.0276
t-Statistic	(17.8)	(2.5)	(0.9)	(-1.0)
	Hong Kong			
	DRm- Rf	DSMB	DHML	DINVSENT
Mean	0.0211 ***	0.3833 *	-0.0078	-0.0036
Std dev	0.0057	1.0471	0.2282	0.0243
t-Statistic	(18.5)	(1.8)	(-0.1)	(-0.6)
	Taiwan			
	DRm- Rf	DSMB	DHML	DINVSENT
Mean	0.0100	0.0025	-0.0033	-0.0008
Std dev	0.0000	0.0092	0.0135	0.0049
t-Statistic	(0.0)	(1.3)	(-1.1)	(0.0)

Panel B: Euro Zone Crisis - Domestics

	China			
	DRm- Rf	DSMB	DHML	DINVSENT
Mean	0.0319 ***	-0.0013	0.0006	0.0000
Std dev	0.0074	0.0323	0.0180	0.0182
t-Statistic	(21.5)	(-0.1)	(0.1)	(0.0)
	Hong Kong			
	DRm- Rf	DSMB	DHML	DINVSENT
Mean	0.0219 ***	0.0103 *	0.0071	0.0010
Std dev	0.0059	0.0262	0.0226	0.0323
t-Statistic	(18.5)	(1.9)	(1.5)	(0.1)
	Taiwan			
	DRm- Rf	DSMB	DHML	DINVSENT
Mean	0.0098 ***	0.0006	0.0003	0.0000
Std dev	0.0018	0.0025	0.0031	0.0044
t-Statistic	(27.2)	(1.1)	(0.4)	(0.0)

Table 35 reports the summary statistics for each of the factors. The summary statistics are monthly mean, standard deviation and t-mean (ratio of the mean to its standard error) statistics for each factor for Global Financial Crisis and Euro Zone Crisis respectively. Panel A and Panel B report the summary statistics of the China, Hong Kong and Taiwan stock market under the domestic model during the Global Financial Crisis and Euro Zone Crisis respectively. DRm- Rf (DMRP) is the market return in excess of the risk-free rate of the domestics model (Market Risk Premium), small minus big (DSMB) is the difference between the return on a portfolio of small market capitalisation stocks and the return on a portfolio of big market capitalisation stocks of the domestics model, high minus low (DHML) is the difference between the return on a portfolio of high book-to-market stocks and the return on a portfolio of low book-to-market stocks of the domestics model and investor sentiment (DINVSENT) is the difference between the return on a portfolio of high trading volume trend stocks and the return on a portfolio of low trading volume trend stocks of the domestics model.

With the exception of the domestics and foreign market risk premium (FMRP) of the international model in the Taiwan stock market during the Global Financial Crisis, the market risk premium has shown significant t-statistics in the China, Hong Kong and Taiwan stock markets during the Global Financial Crisis and Euro Zone Crisis, under the three difference models – world, international (foreign market risk premium) and domestic. The FMRP is marginally significant under the international model of the Taiwan stock market.

During the Global Financial Crisis, the SMB factor is weakly significant under the world model. Under the domestic model, the factor is significant and weakly marginally significant in the China and Hong Kong stock markets. As for the international mode, the foreign small minus big (FSMB) is significant in the Hong Kong market. However, the factor is weakly significant in the China and Taiwan stock markets. The HML factor does not exhibit any form of significance under the three models. . Lastly, the domestic INVSENT factor (DINVSENT) is significant in the Taiwan stock market under the international model.

During the Euzo Zone Crisis, the foreign small minus big factor (FSMB) under the international model is marginally significant in the China stock market. The SMB factor is also weakly significant in the Hong Kong stock market under the domestic model. Similar to the Global Financial Crisis, the HML factor does not exhibit any form of significance under the three models during the Euro Zone Crisis.

Table 36 shows the regression results of monthly portfolio returns on market risk premium / excess market return (MRP), market capitalisation (SMB), book-to-market (HML) and investor sentiment (INVSENT), under three models which examine the effect of integration – world, international and domestics. Panel A, Panel B and Panel C report the regression results of 25 portfolios of the China, Hong Kong and Taiwan stock markets during Global Financial Crisis. Panel D, Panel E and Panel F report the regression results of 25 portfolios of the China, Hong Kong and Taiwan stock markets during Euro Zone Crisis. The standard errors are estimated in the presence of a fixed firm effect (CL-F), a time effect (CL-T) and a fixed firm and time effect (CL – F&T).For full results, please see Appendix E.

Table36 Regression Results of Monthly Portfolio Returns on Market Risk Premium / Excess Market Returns (MRP), Market Capitalisation (SMB) , Book-to-Market (HML) and Investor Sentiment (INVSENT) – Market Integration Panel – OLS (Estimating Standard Errors in the Presence of a Fixed Firm and/or Time Effect)

Panel A: Global Financial Crisis - China

	WMRP		WSMB		WHML		WINVSENT		Adj.R2	Std.Errors
World Model	0.02		0.016		0.0222		-0.1198		0.0134	CL-T
	(0.01)		(1.39)		(0.39)		(-0.27)			
	DMRP		DSMB		DHML		DINVSENT			
International Model	6.5927	*	-4.2164	**	-0.9094		1.0369	*		
	(1.70)		(-2.00)		(-0.64)		(1.68)			
	FMRP		FSMB		FHML		FINVSENT		Adj.R2	Std.Errors
	-5.9849		0.0014		0.0677		-0.2447		0.2316	CL-T
	(-1.55)		(0.09)		(0.77)		(-0.32)			
	DMRP		DSMB		DHML		DINVSENT		Adj.R2	Std.Errors
Domestics Model	2.3223		-4.2689	*	-0.3265		0.6804		0.1565	CL-T
	(0.73)		(-1.84)		(-0.24)		(0.99)			

Panel B: Global Financial Crisis - Hong Kong

	WMRP		WSMB		WHML		WINVSENT		Adj.R2	Std.Errors
World Model	-		0.0117	***	-0.2251	***	-		0.0534	CL - F & T
			(3.04)		(-9.42)					
	DMRP		DSMB		DHML		DINVSENT			
International Model	-0.1821	***	-		0.0083	**	-0.2279	****		
	(-13.89)				(2.13)		(-9.41)			
	FMRP		FSMB		FHML		FINVSENT		Adj.R2	Std.Errors
	-		-		-		-		0.5719	CL - F & T
	DMRP		DSMB		DHML		DINVSENT		Adj.R2	Std.Errors
Domestics Model	-		0.0083	**	-0.2279	***	-		0.5738	CL - F & T
			(2.13)		(-9.41)					

Panel C: Global Financial Crisis - Taiwan

	WMRP	WSMB	WHML	WINVSENT	Adj.R2	Std.Errors
World Model	-2.1823	0.0201 *	-0.0125	-0.0196	0.0159	CL-T
	(-0.98)	(1.69)	(-0.32)	(-0.04)		
	DMRP	DSMB	DHML	DINVSENT		
International Model	-	-4.2089	-6.9898 **	-0.9208		
		(-0.97)	(-2.30)	(-0.22)		
	FMRP	FSMB	FHML	FINVSENT	Adj.R2	Std.Errors
	-3.5828 *	0.0218	0.0228	-0.3636	0.0684	CL-T
	(-1.67)	(1.62)	(0.47)	(-0.61)		
	DMRP	DSMB	DHML	DINVSENT	Adj.R2	Std.Errors
Domestics Model	-	-3.9761	-5.5242 *	-2.0248	0.0348	CL-T
		(-0.86)	(-1.85)	(-0.47)		

Panel D: Euro Zone Crisis - China

	WMRP	WSMB	WHML	WINVSENT	Adj.R2	Std.Errors
World Model	24.7155 ***	0.3497	0.8271	1.4219	0.4010	CL- T
	(7.14)	(0.26)	(0.41)	(0.95)		
	DMRP	DSMB	DHML	DINVSENT		
International Model	10.6046	-1.2981	0.6383	3.6186		
	(0.87)	(-0.65)	(1.18)	(1.01)		
	FMRP	FSMB	FHML	FINVSENT	Adj.R2	Std.Errors
	40.2739 **	0.3986	3.0597	2.8365 *	0.3384	CL- T
	(2.18)	(0.18)	(0.93)	(1.76)		
	DMRP	DSMB	DHML	DINVSENT	Adj.R2	Std.Errors
Domestics Model	29.4737 ***	1.2045	1.0639	3.3521	0.2069	CL- T
	(3.48)	(0.84)	(0.23)	(0.87)		

Panel E: Euro Zone Crisis - Hong Kong

	WMRP	WSMB	WHML	WINVSENT	Adj.R2	Std.Errors
World Model	-1.0189	-0.5966	0.4643	0.9249 ***	0.0700	CL- T
	(-1.05)	(-1.59)	(1.28)	(2.63)		
	DMRP	DSMB	DHML	DINVSENT		
International Model	2.8372	0.1511	-0.2090	1.1157 ***		
	(1.08)	(0.24)	(-0.36)	(3.56)		
	FMRP	FSMB	FHML	FINVSENT	Adj.R2	Std.Errors
	-3.5857 ***	-0.7327	1.0668 **	0.3489	0.1186	CL- T
	(-2.60)	(-1.34)	(2.11)	(0.55)		
	DMRP	DSMB	DHML	DINVSENT	Adj.R2	Std.Errors
Domestics Model	-0.4429	0.5491	-0.3985	0.8098 ***	-0.0480	CL- T
	(-0.21)	(0.86)	(-0.58)	(2.68)		

Panel F: Euro Zone Crisis - Taiwan

	WMRP		WSMB		WHML		WINVSENT		Adj.R2	Std.Errors
World Model	-0.9954		-0.5847		0.8695	**	0.6810	*	0.1879	CL- T
	(-0.93)		(-1.41)		(2.22)		(1.88)			
	DMRP		DSMB		DHML		DINVSENT			
International Model	13.8692	**	6.628	**	-6.5602	**	-5.4998			
	(2.52)		(1.98)		(-2.08)		(-1.34)			
	FMRP		FSMB		FHML		FINVSENT		Adj.R2	Std.Errors
	-0.9015		-0.3059		0.9391		1.0209	***	0.3631	CL- T
	(-1.11)		(-0.79)		(2.35)		(3.23)			
	DMRP		DSMB		DHML		DINVSENT		Adj.R2	Std.Errors
Domestics Model	5.8058		10.7952	***	-4.255	***	-0.321		0.1506	CL- T
	(1.24)		(6.41)		(-3.73)		(-1.60)			

Notes: Values in the parentheses are the t-statistics. *, **, *** significant at 10%, 5%, 1% respectively

Table 36 shows the regression results of monthly portfolio returns on market risk premium (MRP), market capitalisation (SMB), book-to-market (HML) and investor sentiment (INVSENT), under three models which examine the effect of integration – world, international and domestics. Panel A, Panel B and Panel C report the regression results of 25 portfolios of the China, Hong Kong and Taiwan stock markets during Global Financial Crisis. Panel D, Panel E and Panel F report the regression results of 25 portfolios of the China, Hong Kong and Taiwan stock markets during Euro Zone Crisis. Coefficients (t-statistics) are presented from the OLS using monthly cross section time series data for China, Hong Kong and Taiwan stock markets during Global Financial Crisis and Euro Zone Crisis. OLS regressions are presented for each of the stock market, where a separate regression is estimated for each of the model.. The standard errors are estimated in the presence of a fixed firm effect (CL-F), a time effect (CL-T) and a fixed firm and time effect (CL – F&T).

Global Financial Crisis

During the Global Financial Crisis, the market risk premium factor has a weakly significant coefficient in the China stock market under the international model. The coefficient of the DMRP factor of the international model is positive.

The domestics SMB factor of the China stock market is marginally significant and weakly significant under the international and domestic models. Size effect is observed as the coefficients are negative.

The HML factor of the China stock market, however, is insignificant under the three models.

The domestic INVSENT factor is weakly significant in the international model of the China stock market.

The adjusted R-squared of the world, international and domestic models are 0.01, 0.23 and 0.16 respectively.

In Hong Kong, the domestic market risk premium factor has significant negative coefficients under the international model. In addition, the SMB factor has significant and marginally coefficients under the world and domestic models. As for the HML factor, it is negatively significant under the world model and domestic model. Therefore, growth effect is observed. Further examination shows that the domestic HML factor of the international model is marginally significant. Lastly, the domestic INVSENT factor of the international model has a negative significant coefficient.

The adjusted R-squared of the world, international and domestic models are 0.05, 0.57 and 0.57 respectively.

In Taiwan, the market risk premium factor is insignificant under of the three models. The SMB factor is weakly significant under the world model. Thirdl, the domestic HML factors of the international and domestic models are marginally and weakly significant respectively. Both have negative coefficients. Lastly, the INVSENT factor is insignificant statistically under the three models.

The adjusted R-squared of the world, international and domestic models are 0.02, 0.07 and 0.03 respectively.

Euro Zone Crisis

The market risk premium has shown significant positive coefficient in the China stock market under the world and domestic models. In addition, the foreign market risk premium (FMRP) factor of the international model is marginally significant.

The SMB factor and HML factors, however, are insignificant under the three models. The foreign INVSENT factor of the international model is weakly significant.

The adjusted R-squared of the world, international and domestic models are 0.40, 0.34 and 0.21 respectively.

In Hong Kong, the foreign market risk premium factor of the international model has a significant negative coefficient. However, the SMB factor is insignificant under the three models. In addition, the foreign HML factor of the international model is marginally significant. With the exception of foreign INVSENT factor under the international model, the INVSENT factor is positively significant under the three models.

The adjusted R-squared of the world, international and domestic models are 0.07, 0.012 and -0.05 respectively.

In Taiwan, the domestic market risk premium factor of the international model is marginally significant. In addition, the domestic SMB factor of the international and domestic models is marginally significant and significant respectively. Similarly, the domestic HML factor of the international and domestic models is marginally significant and significant respectively. Growth effect is observed, as the coefficients are negative. However, the HML factor is marginally significant under the world model, with positive coefficient. Lastly, the INVSENT factor is weakly significant under the world model. The foreign INVSENT factor of the international model has a positive significant coefficient.

The adjusted R-squared of the world, international and domestic models are 0.19, 0.36 and 0.15 respectively.

6.5.2. Noise augmented asset pricing model (based on Fama and French Five Factor Model)

Overall Firm

Table 37 reports the summary statistics for each of the factors. Panel A and Panel B show monthly mean, standard deviation and t-mean (ratio of the mean to its standard error) statistics for each factor for Global Financial Crisis and Euro Zone Crisis respectively.

Table 37 Noised-Augmented Asset Pricing Model (based on Five Factor Model)
Summary Statistics - Averages, standard deviations and t-statistics for month returns

Panel A: Global Financial Crisis						
	China					
	Rm- Rf	SMB	HML	RMW	CMA	INVSENT
Mean	0.0467***	0.0111**	0.0058	0.0200**	0.0222***	-0.0108
Std dev	0.0138	0.0247	0.0348	0.0395	0.0379	0.0503
t-Statistic	(17.6)	(2.2)	(0.8)	(2.5)	(2.9)	(-0.9)
	Hong Kong					
	Rm- Rf	SMB	HML	RMW	CMA	INVSENT
Mean	0.0556***	1.0528*	-0.0267	-0.0161	0.0081	-0.0103
Std dev	0.0164	2.8525	0.6192	0.0661	0.1562	0.0701
t-Statistic	(16.7)	(1.8)	(-0.2)	(-1.2)	(0.2)	(-0.7)
	Taiwan					
	Rm- Rf	SMB	HML	RMW	CMA	INVSENT
Mean	0.0633***	0.0264	-0.0381	0.0167**	-0.0033	-0.0017
Std dev	0.0091	0.0862	0.1234	0.0352	0.1448	0.0489
t-Statistic	(34.7)	(1.5)	(-1.5)	(2.3)	(-0.1)	(-0.1)

Panel B: Euro Zone Crisis

	Rm- Rf	SMB	HML	RMW	CMA	INVSENT
China						
Mean	0.0613***	-0.0010	0.0003	0.0145***	0.0071	0.0003
Std dev	0.0162	0.0585	0.0325	0.0186	0.0831	0.0337
t-Statistic	(18.9)	(0.0)	(0.0)	(3.8)	(0.4)	(0.0)
Hong Kong						
Mean	0.0584***	0.0294*	0.0190	-0.0165	-0.0106	0.0000
Std dev	0.0144	0.0744	0.0614	0.0732	0.0501	0.0909
t-Statistic	(20.2)	(1.9)	(1.5)	(-1.0)	(-0.9)	(0.0)
Taiwan						
Mean	0.0677***	0.0087*	0.0010	0.0229***	0.0168***	0.0003
Std dev	0.0066	0.0249	0.0324	0.0241	0.0319	0.0353
t-Statistic	(51.2)	(1.7)	(0.1)	(4.7)	(2.6)	(0.0)

Table 37 reports the summary statistics for each of the factors. Panel A and Panel B show monthly mean, standard deviation and t-mean (ratio of the mean to its standard error) statistics for each factor for Global Financial Crisis and Euro Zone Crisis respectively. Rm- Rf (MRP) is the market return in excess of the risk-free rate (Market Risk Premium), small minus big (SMB) is the difference between the return on a portfolio of small market capitalisation stocks and the return on a portfolio of big market capitalisation stocks, high minus low (HML) is the difference between the return on a portfolio of high book-to-market stocks and the return on a portfolio of low book-to-market stocks, robust minus weak (RMW) is the difference between the returns on diversified portfolios of stocks with robust and weak profitability and conservative minus aggressive (CMA) is the difference between the returns on diversified portfolios of low and high investment firms, investor sentiment (INVSENT) is the difference between the return on a portfolio of high trading trend stocks and the return on a portfolio of low high investor trading trend stocks.

The market risk premium / excess market return has shown significant t-statistics for China, Hong Kong and Taiwan stock markets during the Global Financial Crisis and Euro Zone Crisis. In addition, the SMB factor is weakly significant in Hong Kong stock market during the Global Financial Crisis and Euro Zone Crisis. The profitability factor exhibit significant t-statistics in the China and Taiwan stock markets during the Euro Zone Crisis. During the Global Financial Crisis, the profitability factor is marginally significant in the China and Taiwan stock markets. The investment factor is significant in the China stock market during Global Financial Crisis and Taiwan stock market during Euro Zone Crisis/

Table 38 shows the regression results of monthly portfolio returns on market risk premium/ excess market return (MRP), market capitalisation (SMB), book-to-market (HML), profitability factor (RMW), investment factor (CMA) and investor sentiment (INVSENT). Coefficients (t-statistics) are presented from the OLS using monthly cross section time series data for China , Hong Kong and Taiwan stock markets during Global Financial Crisis and Euro Zone Crisis. OLS regressions are presented for each of the stock market, where a separate regression is estimated for each of them. The standard errors are estimated in the presence of a fixed firm effect (CL-F), a time effect (CL-T) and a fixed firm and time effect (CL – F&T).For full results, please see Appendix F.

Table 38 Regression Results of Monthly Portfolio Returns on Market Risk Premium / Excess Market Return (MRP), Market Capitalisation (SMB),Book-to-Market (HML), Profitability Factor (RMW), Investment Factor (CMA) and Investor Sentiment (INVSENT)
Panel – OLS (Estimating Standard Errors in the Presence of a Fixed Firm and/or Time Effect)

Panel A: Global Financial Crisis

Stock Market	MRP	SMB	HML	RMW	CMA	INVSENT	Adjusted R-Squared	Std. Errors
China	-1.0213	-2.3562**	-0.1772	-1.0194	0.6643	0.2446	0.1595	CL- T
	(-0.69)	(-2.07)	(-0.20)	(-0.65)	(0.50)	(0.55)		
Hong Kong	-	0.0028**	-0.0829***	-	-	-	0.5728	CL - F & T
		(1.97)	(-9.39)					
Taiwan	-4.0858***	-0.8851	-0.7221*	-0.1178	-1.1338	-0.2407	0.1088	CL- T
	(-2.57)	(-1.60)	(-1.74)	(-0.28)	(-1.64)	(-0.65)		

Panel B: Euro Zone Crisis

Stock Market	MRP	SMB	HML	RMW	CMA	INVSENT	Adjusted R- Squared	Std. Errors
China	19.2552***	0.7954	-0.5240	1.8377	-0.7092	1.4125	0.3680	CL- T
	(5.26)	(0.71)	(-0.16)	(0.38)	(-0.55)	(0.87)		
Hong Kong	-0.7099	0.0277	-0.134	-0.0888	-0.3199	0.1982*	0.0663	CL- T
	(-0.73)	(0.10)	(-0.56)	(-0.54)	(-0.95)	(1.84)		
Taiwan	-4.8645**	-0.9659	0.2433	-0.5177	-0.3636	0.6619*	0.2446	CL- T
	(-2.22)	(-1.47)	(0.47)	(-0.43)	(-0.38)	(1.80)		

*Note: Values in the parentheses are the t-statistics. *, **, *** significant at 10%, 5%, 1% respectively.*

Table 38 shows the regression results of monthly portfolio returns on market risk premium (MRP), market capitalisation (SMB), book-to-market (HML), profitability factor (RMW), investment factor (CMA) and investor sentiment (INVSENT). Coefficients (t-statistics) are presented from the OLS using monthly cross section time series data for China, Hong Kong and Taiwan stock markets during Global Financial Crisis and Euro Zone Crisis. OLS regressions are presented for each of the stock market, where a separate regression is estimated for each of them. The standard errors are estimated in the presence of a fixed firm effect (CL-F), a time effect (CL-T) and a fixed firm and time effect (CL – F&T).

The market risk premium / excess market return factor exhibits significant negative t-statistics for the Taiwan stock markets during the Global Financial Crisis and Euro Zone Crisis. However, the China stock market exhibits significant positive t-statistics during the Euro Zone Crisis.

The SMB factor is marginally and weakly significant in the China and Hong Kong stock markets during Global Financial Crisis. The size effect is observed in the China stock market, as the coefficient is negative. However, the SMB factor is insignificant in the three stock markets during the Euro Zone Crisis.

The HML factor is significant and weakly significant in the Hong Kong and Taiwan stock markets during the Global Financial Crisis. Growth effect is observed in these markets as the coefficient is negative.

During the Global Financial Crisis, the profitability factor (RMW) is significant for the China and Hong Kong stock markets. The coefficients of both the markets are negatives. Whereas during the Euro Zone Crisis, the profitability factor (RMW) is significant for the China and Taiwan stock market. Only the coefficient of the China stock market is positive.

The investment factor (CMA) and the profitability factor (RMW) are insignificant in the three stock markets during the Global Financial Crisis and Euro Zone Crisis.

The INVSENT factor is insignificant in the three stock markets during the Global Financial Crisis. During the Euro Zone Crisis, the Hong Kong and Taiwan stock market have weakly significant INVSENT factor.

The adjusted R-squared for the China, Hong Kong and Taiwan stock markets are 0.16, 0.57 and 0.11 respectively during the Global Financial Crisis. During the Euro Zone Crisis, the adjusted R-squared changes to 0.37, 0.07 and 0.24 respectively.

Market Capitalisation

Table 39 reports the summary statistics for each of the factors. The summary statistics are monthly mean, standard deviation and t-mean (ratio of the mean to its standard error) statistics for each factor for Global Financial Crisis and Euro Zone Crisis respectively. Panel A and Panel B report the summary statistics of small market capitalisation and big market capitalisation portfolios during Global Financial Crisis. Panel C and Panel D report the summary statistics of small market capitalisation and big market capitalisation portfolios during Euro Zone Crisis

Only the market risk premium / excess market return has shown significant t-statistics for China, Hong Kong and Taiwan stock markets during the Global Financial Crisis and Euro Zone Crisis.

Table 39 Noised-Augmented Asset Pricing Model (based on Five Factor Model)
Market Capitalisation
Summary Statistics - Averages, standard deviations and t-statistics for month returns

Panel A: Global Financial Crisis - Small Cap

	China					
	Rm- Rf	SMB	HML	RMW	CMA	INVSENT
Mean	0.0467***	0.0144	0.0339	0.0422	0.0514	-0.0108
Std dev	0.0138	0.0497	0.1025	0.1172	0.0900	0.0504
t-Stat	(7.5)	(0.6)	(0.7)	(0.8)	(1.2)	(-0.4)
	Hong Kong					
	Rm- Rf	SMB	HML	RMW	CMA	INVSENT
Mean	0.0556***	0.0636	-0.0872	-0.0222	0.0719	-0.0103
Std dev	0.0165	0.1156	0.1205	0.0782	0.1003	0.07030
t-Stat	(7.5)	(1.2)	(-1.6)	(-0.6)	(1.6)	(-0.3)
	Taiwan					
	Rm- Rf	SMB	HML	RMW	CMA	INVSENT
Mean	0.0507***	0.0864	-0.0922	0.0186	0.0289	-0.0017
Std dev	0.0267	0.3831	0.3772	0.0503	0.0455	0.0490
t-Stat	(4.2)	(0.5)	(-0.5)	(0.8)	(1.4)	(0.0)

Panel B: Global Financial Crisis - Big Cap

	China					
	Rm- Rf	SMB	HML	RMW	CMA	INVSENT
Mean	0.0467	0.0139	-0.0031	0.0119	0.0117	-0.0108
Std dev	0.0138	0.0449	0.0453	0.0590	0.0626	0.0504
t-Stat	(7.5)***	(0.6)	(-0.1)	(0.4)	(0.4)	(-0.4)
	Hong Kong					
	Rm- Rf	SMB	HML	RMW	CMA	INVSENT
Mean	0.0556	0.0047	-0.0231	0.0039	0.0300	-0.0103
Std dev	0.0165	0.1339	0.0720	0.0709	0.1401	0.0703
t-Stat	(7.5)***	(0.0)	(-0.7)	(0.1)	(0.4)	(-0.3)
	Taiwan					
	Rm- Rf	SMB	HML	RMW	CMA	INVSENT
Mean	0.0507	-0.0022	-0.0158	0.0150	0.0253	-0.0017
Std dev	0.0267	0.0492	0.0387	0.0579	0.0508	0.0490
t-Stat	(4.2)***	(0.0)	(-0.8)	(0.5)	(1.1)	(0.0)

Panel C: Euro Zone Crisis - Small Cap

	Rm- Rf	SMB	HML	RMW	CMA	INVSENT
China						
Mean	0.0600	0.0106	0.0035	0.0142	0.0216	-0.0006
Std dev	0.0160	0.0298	0.0372	0.0303	0.0280	0.0333
t-Stat	(8.3)***	(0.7)	(0.2)	(1.0)	(1.7)	(0.0)
Hong Hong						
Mean	0.0584	0.0548	-0.0506	-0.0219	0.0558	0.0000
Std dev	0.0144	0.1526	0.0741	0.0790	0.1614	0.0911
t-Stat	(9.0)***	(0.8)	(-1.5)	(-0.5)	(0.7)	(0.0)
Taiwan						
Mean	0.0677	0.0197	0.0023	-0.0145	-0.0152	0.0003
Std dev	0.0066	0.0560	0.0452	0.0346	0.0437	0.0354
t-Stat	(22.9)***	(0.7)	(0.1)	(-0.9)	(-0.7)	(0.0)

Panel D: Euro Zone Crisis - Big Cap

	Rm- Rf	SMB	HML	RMW	CMA	INVSENT
China						
Mean	0.0600	0.0071	-0.0090	0.0087	0.0116	-0.0006
Std dev	0.0160	0.0453	0.0515	0.0516	0.0388	0.0333
t-Stat	(8.3)***	(0.3)	(-0.3)	(0.3)	(0.6)	(0.0)
Hong Kong						
Mean	0.0584	0.0213	0.0097	0.0103	-0.0058	0.0000
Std dev	0.0144	0.0782	0.1367	0.0402	0.1611	0.0911
t-Stat	(9.0)***	(0.6)	(0.1)	(0.5)	(0.0)	(0.0)
Taiwan						
Mean	0.0677	-0.0032	-0.0003	0.0016	0.0003	0.0003
Std dev	0.0066	0.0258	0.0341	0.0375	0.0290	0.0354
t-Stat	(22.9)***	(-0.2)	(0.0)	(0.0)	(0.0)	(0.0)

Table 39 reports the summary statistics for each of the factors. The summary statistics are monthly mean, standard deviation and t-mean (ratio of the mean to its standard error) statistics for each factor for Global Financial Crisis and Euro Zone Crisis respectively. Panel A and Panel B report the summary statistics of small market capitalisation and big market capitalisation portfolios during Global Financial Crisis. Panel C and Panel D report the summary statistics of small market capitalisation and big market capitalisation portfolios during Euro Zone Crisis. Rm- Rf (MRP) is the market return in excess of the risk-free rate (Market Risk Premium), small minus big (SMB) is the difference between the return on a portfolio of small market capitalisation stocks and the return on a portfolio of big market capitalisation stock, high minus low (HML) is the difference between the return on a portfolio of high book-to-market stocks and the return on a portfolio of low book-to-market stocks , robust minus weak (RMW) is the difference between the returns on diversified portfolios of stocks with robust and weak profitability, conservative minus aggressive (CMA) is the difference between the returns on diversified portfolios of low and high investment firms, and investor sentiment (INVSENT) is the difference between the return on a portfolio of high trading trend stocks and the return on a portfolio of low trading volume trend stocks.

Table 40 shows the regression results of monthly portfolio returns on market risk premium / excess market return (MRP), market capitalisation (SMB), book-to-market (HML), profitability factor (RMW), investment factor (CMA) and investor sentiment (INVSENT). Panel A and Panel B report the regression results of small market capitalisation and big market capitalisation portfolios during Global Financial Crisis. Panel C and Panel D report the regression results of small market capitalisation and big market capitalisation portfolios during Euro Zone Crisis. The standard errors are estimated in the presence of a fixed firm effect (CL-F), a time effect (CL-T) and a fixed firm and time effect (CL – F&T).For full results, please see Appendix F.

Table 40
Regression Results of Monthly Portfolio Returns on Market Risk Premium / Excess Market Return (MRP), Market Capitalisation (SMB),Book-to-Market (HML), Profitability Factor (RMW), Investment Factor (CMA) and Investor Sentiment (INVSENT) – Market Capitalisation
Panel – OLS (Estimating Standard Errors in the Presence of a Fixed Firm and/or Time Effect)

Panel A: Global Financial Crisis - Small Cap

Stock Market	MRP	SMB	HML	RMW	CMA	INVSENT	Adjusted R-Squared	Std. Errors
China	-0.6605	-0.9433***	-0.2469	0.0705	0.5130	0.2532	-0.2176	CL-T
	(-0.42)	(-2.17)	(-0.53)	(0.13)	(1.39)	(0.95)		
Hong Kong	-1.5900*	0.0534	0.0477	0.1830	-0.7809**	0.5189	0.2722	CL-T
	(-1.73)	(0.19)	(0.20)	(0.83)	(-2.16)	(1.36)		
Taiwan	0.4695	0.2724	-	-	-	-	0.4021	CL - F & T
	(1.31)	(1.20)						

Panel B: Global Financial Crisis - Big Cap

Stock Market	MRP	SMB	HML	RMW	CMA	INVSENT	Adjusted R-Squared	Std. Errors
China	-0.5337	0.6623	-0.0512	0.0646	0.5756*	-0.1951	0.0322	CL-T
	(-0.33)	(0.98)	-(-0.08)	(0.37)	(1.69)	(-0.75)		
Hong Kong	-2.0869**	-0.2767	0.0543	-0.0054	-1.4372***	0.2979	0.4616	CL-T
	(-2.56)	(-0.90)	(0.24)	(-0.02)	(-5.83)	(1.63)		
Taiwan	-0.1397	0.8306	-0.2937	2.158***	-2.187***	-0.1455	0.5024	CL-T
	(-0.98)	(1.09)	(-0.61)	(6.15)	(-4.23)	(-0.49)		

Panel C: Euro Zone Crisis - Small Cap

Stock Market	MRP	SMB	HML	RMW	CMA	INVSENT	Adjusted R-Squared	Std. Errors
China	0.1336	-1.4909***	-0.4726*	0.5839*	-1.0526***	-0.0148	0.5501	CL-T
	(0.25)	(-4.65)	(-1.85)	(1.65)	(-4.71)	(-0.06)		
Hong Kong	-1.6656**	0.0202	-0.3130***	0.0981	0.0903	0.2362**	-0.2460	CL-T
	(-2.16)	(0.21)	(-2.52)	(1.15)	(0.56)	(1.97)		
Taiwan	-3.9684**	-0.6348**	0.1007	1.2860***	-1.8950***	0.5428***	0.4922	CL-T
	(-2.32)	(-2.53)	(0.47)	(3.73)	(-3.96)	(9.25)		

Panel D: Euro Zone Crisis - Big Cap

Stock Market	MRP	SMB	HML	RMW	CMA	INVSENT	Adjusted R-Squared	Std. Errors
China	-0.0099	1.1119***	0.6318***	0.5098	0.2264	-0.3398	0.2209	CL-T
	(-0.02)	(2.59)	(3.86)	(0.69)	(0.65)	(-1.12)		
Hong Kong	-0.6531	0.0498	0.3393	0.0681	-0.2352	0.2122**	0.2237	CL-T
	(-0.61)	(0.10)	(1.32)	(0.20)	(-0.58)	(2.06)		
Taiwan	-4.0968***	0.4977	-0. 2325	3.1164***	-2.4662***	0.4942*	0.5573	CL-T
	(-2.80)	(1.03)	(-0.76)	(4.86)	(-5.66)	(1.78)		

Notes: Values in the parentheses are the t-statistics. *, **, *** significant at 10%, 5%, 1% respectively

Table 40 shows the regression results of monthly portfolio returns on market risk premium / excess market return (MRP), market capitalisation (SMB), book-to-market (HML), profitability factor (RMW), investment factor (CMA) and investor sentiment (INVSENT). Panel A and Panel B report the regression results of small market capitalisation and big market capitalisation portfolios during Global Financial Crisis. Panel C and Panel D report the regression results of small market capitalisation and big market capitalisation portfolios during Euro Zone Crisis. Coefficients (t-statistics) are presented from the OLS using monthly cross section time series data for China , Hong Kong and Taiwan stock markets during Global Financial Crisis and Euro Zone Crisis. OLS regressions are presented for each of the stock market, where a separate regression is estimated for each of the small or big market capitalization portfolio. The standard errors are estimated in the presence of a fixed firm effect (CL-F), a time effect (CL-T) and a fixed firm and time effect (CL – F&T).

During the Global Financial Crisis, the market risk premium / excess market return factor exhibits weakly significant and marginally significant t-statistics for small and big market capitalisation portfolios of the Hong Kong stock market during the Global Financial Crisis. These coefficients of the market risk premium are negatives. On other hand, the market risk premium / excess market return factor exhibits marginally significant t-statistics for small market capitalisation portfolios of the Hong Kong and Taiwan stock markets. These coefficients of the market risk premium are negatives as well. As for the big market capitalisation portfolios, the Taiwan stock market has a negatively significant coefficient.

During the Global Financial Crisis, the small market capitalisation portfolios of the China stock market have a negatively significant coefficient. Hence, size effect is observed. Furthermore, the small market capitalisation portfolios of the China and Taiwan stock markets have significant and marginally significant coefficients during the Euro Zone Crisis. Therefore, size effect is observed as well. In addition, the big market capitalisation portfolios of the China stock market exhibit a positive significant coefficient.

During the Global Financial Crisis, the HML factor is insignificant for both the small and big market capitalisation portfolios of the three stock markets. During the Euro Zone Crisis, the HML factor is weakly significant and significant for the small market capitalisation portfolios of the China and Hong Kong Taiwan stock markets. Growth effect is observed as the coefficients are negatives. On the other hand, the big market capitalisation portfolios of the China stock market exhibits positively signifcaint HML factor.

The profitability factor (RMW) shows mixed results. With the exception of big market capitalisation of Taiwan stock market, the factor is insignificant in both the small and big market capitalisation portfolios of the three stock markets during the Global Financial Crisis. During the Euro Zone Crisis, the RMW factor is weakly significant and significant in the small market capitalisation portflios of the China and Taiwan stock markets. Furthermore, the factor is significant in the big market capitalisation portflios of the Taiwan stock market during the Euro Zone Crisis.

During the Global Financial Crisis, the investment factor (CMA) is weak significant in the big market capitalisation portfolio of China stock market. In addition, the factor is marginally significant and significant in the small and big market capitalisation portfolios of the Hong Kong stock market respectively. As for the Taiwan stock market, the factor is negatively significant for the big market capitalisation. During the Euro Zone Crisis, the investment factor is negatively significant in small market capitalisation portfolios of the

China and Taiwan stock markets. The factor is also negatively significant in the big market capitalisation portfolios of the Taiwan stock market.

The INVSENT factor shows mixed results. During the Global Financial Crisis, the factor is insignificant in both the small and big market capitalisation portfolios of the three stock markets. During the Euro Zone Crisis, the INVENT factor is marginally significant and significant in the small market capitalisation portfolios of the Hong Kong and Taiwan stock markets. The factor is also marginally significant and weakly significant in the big market capitalisation portfolios of the Hong Kong and Taiwan stock markets.

During the Global Financial Crisis, the adjusted R-squared for the small market capitalisation of the China, Hong Kong and Taiwan stock markets are -0.21, 0.27 and 0.40 respectively. Whereas, the adjusted R-squared for the big market capitalization are 0.03, 0.46 and 0.50. On the other hand, the adjusted R-squared for the small market capitalisation of the China, Hong Kong and Taiwan stock markets are 0.55, -0.24 and 0.49 respectively during Euro Zone Crisis. The adjusted R-squared for the big market capitalisation are 0.22, 0.22 and 0.56.

Integration

Table 41 reports the summary statistics for each of the factors. The summary statistics are monthly mean, standard deviation and t-mean (ratio of the mean to its standard error) statistics for each factor for Global Financial Crisis and Euro Zone Crisis respectively. Panel A and Panel B report the summary statistics of the China, Hong Kong and Taiwan stock market under the world model during the Global Financial Crisis and Euro Zone Crisis respectively

Table 41 Noised-Augmented Asset Pricing Model (based on Five Factor Model) – Integration
Summary Statistics - Averages, standard deviations and t-statistics for month returns - World Model

Panel A: Global Financial Crisis - World

	WRm- Rf	WSMB	WHML	WRMW	WCMA	WINVSENT
Mean	0.0525 ***	0.3908 *	-0.0083	0.0064	0.0144	-0.0086
Std dev	0.0112	1.0466	0.2320	0.0338	0.0640	0.0364
t-Stat	(23.2)	(1.8)	(-0.1)	(0.9)	(1.1)	(-1.0)

Panel B : Euro Zone Crisis - World

	WRm- Rf	WSMB	WHML	WRMW	WCMA	WINVSENT
Mean	0.0610***	0.0094	0.0068	0.0023	0.0035	0.0013
Std dev	0.0130	0.0340	0.0295	0.0555	0.0252	0.0362
t-Stat	(23.2)	(1.3)	(1.1)	(0.2)	(0.6)	(0.10)

Table 41 reports the summary statistics for each of the factors. The summary statistics are monthly mean, standard deviation and t-mean (ratio of the mean to its standard error) statistics for each factor for Global Financial Crisis and Euro Zone Crisis respectively. Panel A and Panel B report the summary statistics of the China, Hong Kong and Taiwan stock market under the world model during the Global Financial Crisis and Euro Zone Crisis respectively. WRm- Rf (WMRP) is the market return in excess of the risk-free rate of the world model (Market Risk Premium), small minus big (WSMB) is the difference between the return on a portfolio of small market capitalisation stocks and the return on a portfolio of big market capitalisation stocks of the world model and high minus low (WHML) is the difference between the return on a portfolio of high book-to-market stocks and the return on a portfolio of low book-to-market stocks of the world model, robust minus weak (WRMW) is the difference between the returns on diversified portfolios of stocks with robust and weak profitability of the world model, conservative minus aggressive (WCMA) is the difference between the returns on diversified portfolios of low and high investment firms of the world model and investor sentiment (WINVSENT) is the difference between the return on a portfolio of high trading volume trend stocks and the return on a portfolio of low trading volume trend stocks of the world model.

Table 42 reports the summary statistics for each of the factors. The summary statistics are monthly mean, standard deviation and t-mean (ratio of the mean to its standard error) statistics for each factor for Global Financial Crisis and Euro Zone Crisis respectively. Panel A and Panel B report the summary statistics of the China, Hong Kong and Taiwan stock market under the international model during the Global Financial Crisis and Euro Zone Crisis respectively.

Table 42 Noised-Augmented Asset Pricing Model (based on Five Factor Model) – Integration
Summary Statistics - Averages, standard deviations and t-statistics for month returns – International Model

Panel A: Global Financial Crisis - International

China

	DRm- Rf	DSMB	DHML	DRMW	DCMA	DINVSENT	FRm- Rf	FSMB	FHML	FRMW	FCMA	FINVSENT
Mean	0.0247 ***	0.0061**	0.0036	0.0106**	0.0117**	*-0.0064	0.0267***	0.3861*	-0.0117	-0.0044	0.0036	-0.0039
Std dev	0.0069	0.0119	0.0187	0.0216	0.0212	0.0276	0.0078	1.0452	0.2289	0.0246	0.0612	0.0268
t-Statistic	(17.8)	(2.5)	(0.9)	(2.4)	(2.7)	(-1.0)	(17.1)	(1.8)	(-0.2)	(-0.8)	(0.2)	(-0.5)

Hong Kong

	DRm- Rf	DSMB	DHML	DRMW	DCMA	DINVSENT	FRm- Rf	FSMB	FHML	FRMW	FCMA	FINVSENT
Mean	0.0211***	0.3833*	-0.0078	-0.0053	0.0025	-0.0036	0.0319***	0.0092**	-0.0003	0.0122	0.0103	-0.0056
Std dev	0.0057	1.0471	0.2282	0.0236	0.0571	0.0243	0.0084	0.0171	0.0228	0.0221	0.0226	0.0273
t-Statistic	(18.5)	(1.8)	(-0.1)	(-1.0)	(0.2)	(-0.6)	(18.9)	(2.6)	(0.0)	(2.7)	(2.2)	(-0.9)

Taiwan

	DRm- Rf	DSMB	DHML	DRMW	DCMA	DINVSENT	FRm- Rf	FSMB	FHML	FRMW	FCMA	FINVSENT
Mean	0.0100	0.0025	-0.0033	0.0019**	-0.0008	-0.0080***	0.0045**	0.3878*	-0.0053	0.0044	0.0156	-0.0092
Std dev	0.0000	0.0092	0.0135	0.0040	0.0156	0.0049	0.0112	1.0476	0.2312	0.0336	0.0615	0.0349
t-Statistic	(0.0)	(1.3)	(-1.1)	(2.3)	(0.0)	(-8.1)	(2.0)	(1.8)	(-0.1)	(0.6)	(1.2)	(-1.2)

Panel B: Euro Zone Crisis - International

China

	DRm- Rf	DSMB	DHML	DRMW	DCMA	DINVSENT	FRm- Rf	FSMB	FHML	FRMW	FCMA	FINVSENT
Mean	0.0319***	-0.0013	0.0006	0.0048	0.0071***	0.0000	0.0274***	0.0113**	0.0071	-0.0016	-0.0045	(0.0045)
Std dev	0.0074	0.0323	0.0180	0.0440	0.0108	0.0182	0.0062	0.0276	0.0230	0.0187	0.0268	0.0268
t-Statistic	(21.5)	(-0.1)	(0.1)	(0.5)	(3.2)	(0.0)	(22.0)	(2.0)	(1.5)	(-0.2)	(-0.7)	(-0.7)

Hong Kong

	DRm- Rf	DSMB	DHML	DRMW	DCMA	DINVSENT	FRm- Rf	FSMB	FHML	FRMW	FCMA	FINVSENT
Mean	0.0219***	0.0103*	0.0071	0.0065	-0.0061	0.0010	0.0390***	0.0000	-0.0003	0.0065	0.0094***	0.0000
Std dev	0.0059	0.0262	0.0226	0.0444	0.0269	0.0323	0.0100	0.0315	0.0179	0.0444	0.0108	0.0174
t-Statistic	(18.5)	(1.9)	(1.5)	(0.7)	(-1.1)	(0.1)	(19.5)	(0.0)	(0.0)	(0.7)	(4.3)	(0.0)

Taiwan

	DRm- Rf	DSMB	DHML	DRMW	DCMA	DINVSENT	FRm- Rf	FSMB	FHML	FRMW	FCM	FINVSENT
Mean	0.0098***	0.0006	0.0003	0.0013	0.0016	0.0000	0.0529***	0.0087	0.0065	0.0003	0.0010	0.0010
Std dev	0.0018	0.0025	0.0031	0.0042	0.0370	0.0044	0.0140	0.0325	0.0290	0.0539	0.0261	0.0350
t-Statistic	(27.2)	(1.1)	(0.4)	(1.5)	(0.2)	(0.0)	(18.8)	(1.3)	(1.1)	(0.0)	(0.1)	(0.1)

Table 42 reports the summary statistics for each of the factors. The summary statistics are monthly mean, standard deviation and t-mean (ratio of the mean to its standard error) statistics for each factor for Global Financial Crisis and Euro Zone Crisis respectively. Panel A and Panel B report the summary statistics of the China, Hong Kong and Taiwan stock market under the international model during the Global Financial Crisis and Euro Zone Crisis respectively. DRm- Rf (DMRP) is the market return in excess of the risk-free rate of the domestics model (Market Risk Premium), small minus big (DSMB) is the difference between the return on a portfolio of small market capitalisation stocks and the return on a portfolio of big market capitalisation stocks of the domestics model and high minus low (DHML) is the difference between the return on a portfolio of high book-to-market stocks and the return on a portfolio of low book-to-market stocks of the domestics model, robust minus weak (DRMW) is the difference between the returns on diversified portfolios of stocks with robust and weak profitability of the domestics model and conservative minus aggressive (DCMA) is the difference between the returns on diversified portfolios of low and high investment firms of domestics model and investor sentiment (DINVSENT) is the difference between the return on a portfolio of high trading volume trend stocks and the return on a portfolio of low trading volume trend stocks of the domestics model. FRm- Rf (FMRP) is the market return in excess of the risk-free rate of the foreign element in the international model (Market Risk Premium), small minus big (FSMB) is the difference between the return on a portfolio of small market capitalisation stocks and the return on a portfolio of big market capitalisation stocks of the foreign element in the international model and high minus low (FHML) is the difference between the return on a portfolio of high book-to-market stocks and the return on a portfolio of low book-to-market stocks of the foreign element in the international model, , robust minus weak (FRMW) is the difference between the returns on diversified portfolios of stocks with robust and weak profitability of the foreign element of the international model, conservative minus aggressive (FCMA) is the difference between the returns on diversified portfolios of low and high investment firms of foreign of the international model and investor sentiment (FINVSENT) is the difference between the return on a portfolio of high investor trading trend stocks and the return on a portfolio of low trading volume trend stocks of the foreign element in the international model.

Table 43 reports the summary statistics for each of the factors. The summary statistics are monthly mean, standard deviation and t-mean (ratio of the mean to its standard error) statistics for each factor for Global Financial Crisis and Euro Zone Crisis respectively. Panel A and Panel B report the summary statistics of the China, Hong Kong and Taiwan stock market under the domestic model during the Global Financial Crisis and Euro Zone Crisis respectively

Table 43 Noised-Augmented Asset Pricing Model (based on Five Factor Model)
Summary Statistics - Averages, standard deviations and t-statistics for month returns - Domestic Model

Panel A: Global Financial Crisis - Domestics

	DRm- Rf	DSMB	DHML	DRMW	DCMA	DINVSENT
China						
Mean	0.0247 ***	0.0061**	0.0036	0.0106 **	0.0117***	-0.0064
Std dev	0.0069	0.0119	0.0187	0.0216	0.0212	0.0276
t-Stat	(17.8)	(2.5)	(0.9)	(2.4)	(2.7)	(-1.0)
Hong Kong						
Mean	0.0211 ***	0.3833*	-0.0078	-0.0053	0.0025	-0.0036
Std dev	0.0057	1.0471	0.2282	0.0236	0.0571	0.0243
t-Stat	(18.5)	(1.8)	(-0.1)	(-1.0)	(0.2)	(-0.6)
Taiwan						
Mean	0.0100	0.0025	-0.0033	0.0019 *	-0.0008	-0.0008
Std dev	0.0000	0.0092	0.0135	0.0040	0.0156	0.0049
t-Statistic	(0.0)	(1.3)	(-1.1)	(2.3)	(0.0)	(0.0)

Panel B: Euro Zone Crisis - Domestics

	DRm- Rf	DSMB	DHML	DRMW	DCMA	DINVSENT
China						
Mean	0.0319***	-0.0013	0.0006	0.0048	0.0071 ***	0.0000
Std dev	0.0074	0.0323	0.0180	0.0440	0.0108	0.0182
t-Stat	(21.5)	(-0.1)	(0.1)	(0.5)	(3.2)	(0.0)
Hong Kong						
Mean	0.0219***	0.0103 *	0.0071	0.0065	-0.0061	0.0010
Std dev	0.0059	0.0262	0.0226	0.0444	0.0269	0.0323
t-Stat	(18.5)	(1.9)	(1.5)	(0.7)	(-1.1)	(0.1)

Taiwan	DRm- Rf	DSMB	DHML	DRMW	DCMA	DINVSENT
Mean	0.0098***	0.0006	0.0003	0.0013	0.0016	0.0000
Std dev	0.0018	0.0025	0.0031	0.0042	0.0370	0.0044
t-Statistic	(27.2)	(1.1)	(0.4)	(1.5)	(0.2)	(0.0)

Table 43 reports the summary statistics for each of the factors. The summary statistics are monthly mean, standard deviation and t-mean (ratio of the mean to its standard error) statistics for each factor for Global Financial Crisis and Euro Zone Crisis respectively. Panel A and Panel B report the summary statistics of the China, Hong Kong and Taiwan stock market under the domestic model during the Global Financial Crisis and Euro Zone Crisis respectively. DRm- Rf (DMRP) is the market return in excess of the risk-free rate of the domestics model (Market Risk Premium), small minus big (DSMB) is the difference between the return on a portfolio of small market capitalisation stocks and the return on a portfolio of big market capitalisation stocks of the domestics model and high minus low (DHML) is the difference between the return on a portfolio of high book-to-market stocks and the return on a portfolio of low book-to-market stocks of the domestics model, robust minus weak (DRMW) is the difference between the returns on diversified portfolios of stocks with robust and weak profitability of the domestics model, conservative minus aggressive (DCMA) is the difference between the returns on diversified portfolios of low and high investment firms of domestics model and investor sentiment (DINVSENT) is the difference between the return on a portfolio of high investor trading trend stocks and the return on a portfolio of low trading volume trend stocks of the domestics model.

With the exception of the domestics and foreign market risk premium (FMRP) of the international model in the Taiwan stock market during the Global Financial Crisis, the market risk premium has shown significant t-statistics in the China, Hong Kong and Taiwan stock markets during the Global Financial Crisis and Euro Zone Crisis, under the three difference models – world, international (foreign market risk premium) and domestic. The FMRP is marginally significant under the international model of the Taiwan stock market.

During the Global Financial Crisis, the SMB factor is weakly significant under the world model. Under the domestic model, the factor is significant and weakly marginally significant in the China and Hong Kong stock markets. As for the international model, the foreign small minus big (FSMB) is significant in the Hong Kong market. However, the factor is weakly significant in the China and Taiwan stock markets. The HML factor does not exhibit any form of significance under the three models. The profitability factor is significant and marginal significant in the China and Taiwan stock markets under the domestic model. The foreign profitability factor (FRMW) is significant in the Hong Kong stock market under the international model. In addition, the investment factor is significant in the China stock market under the domestic model. The foreign investment factor (FCMA) is significant in the Hong Kong stock market under the international model. Lastly, the domestic INVSENT factor (DINVSENT) is significant in the Taiwan stock market under the international model.

During the Euzo Zone Crisis, the foreign small minus big factor (FSMB) under the international model is marginally significant in the China stock market. The SMB factor is also weakly significant in the Hong Kong stock market under the domestic model. Similar to the Global Financial Crisis, the HML factor does not exhibit any form of significance under the three models during the Euro Zone Crisis. Furthermore, profitability factor also does not exhibit any form of significance under the three models during the Euro Zone Crisis. The investment factor is significant in the China stock market under the domestic model. The foreign investment factor is also significant in the Hong Kong stock market under the international model.

Table 44 shows the regression results of monthly portfolio returns on market risk premium / excess market return (MRP), market capitalisation (SMB), book-to-market (HML), profitability factor (RMW), investment factor (CMA) and investor sentiment, under three models which examine the effect of integration – world, international and domestics. Panel A, Panel B and Panel C report the regression results of 25 portfolios of the China, Hong Kong and Taiwan stock markets during Global Financial Crisis. Panel D, Panel E and Panel F report the regression results of 25 portfolios of the China, Hong Kong and Taiwan stock markets during Euro Zone Crisis. The standard errors are estimated in the presence of a fixed firm effect (CL-F), a time effect (CL-T) and a fixed firm and time effect (CL – F&T).For full results, please see Appendix F.

Global Financial Crisis

During the Global Financial Crisis, the domestic market risk premium (DMRP) factor and foreign market risk premium (FMRP) factor of the international model have marginally and weakly significant coefficients. In addition, the foreign market risk premium (FMRP) factor of the international model is negatively coefficient. As for the HML factor, it is insignificant under the three models. The investment factor (WCMA) of the world model and the foreign investment factor (FCMA) of the international model are significant. Furthermore, the investment factor of the domestic model (DCMA) is marginally significant. The INVSENT factor is in significant in all the three models.

The adjusted R-squared of the world, international and domestic models are 0.26, 0.49 and 0.22 respectively.

Table 44 Regression Results of Monthly Portfolio Returns on Market Risk Premium / Excess Market Return(MRP), Market Capitalisation (SMB) and Book-to-Market (HML), Profitability Factor (RMW), Investment Factor (CMA) and Investor Sentiment (INVSENT) - Market Integration
Panel – OLS (Estimating Standard Errors in the Presence of a Fixed Firm and/or Time Effect)

Panel A: Global Financial Crisis - China

	WMRP	WSMB	WHML	WRMW	WCMA	WINVSENT	Adjusted R-Squared	Standard Errors
World	0.0971	0.0061	0.0661	0.7295	-1.2882***	-0.3031	0.2626	CL-T
	(0.06)	(0.55)	(0.94)	(1.03)	(-3.16)	(-0.61)		
	DMRP	DSMB	DHML	DRMW	DCMA	DINVSENT		
	7.5722**	-3.8629**	-0.8761	0.3170	-0.9460	1.0213		
Intl.	(2.33)	(-2.48)	(-0.70)	(0.15)	(-0.46)	(1.50)		
	FMRP	FSMB	FHML	FRMW	FCMA	FINVSENT	Adjusted R-Squared	Standard Errors
	-4.6499*	-0.0084	0.1054	-0.5795	-0.9474***	-0.2905		
	(-1.87)	(-0.69)	(1.13)	(-0.68)	(-2.83)	(-0.43)	0.4868	CL-T
	DMRP	DSMB	DHML	DRMW	DCMA	DINVSENT	Adjusted R-Squared	Standard Errors
Domes.	1.2758	-4.4056**	-0.1158	3.6933	-4.2876**	0.4300	0.2227	CL-T
	(0.41)	(-2.06)	(-0.08)	(1.63)	(-1.98)	(0.61)		

Panel B: Global Financial Crisis - Hong Kong

	WMRP	WSMB	WHML	WRMW	WCMA	WINVSENT	Adjusted R-Squared	Standard Errors
World	-	0.0117***	-0.2251***	-	-	-	0.5728	CL - F & T
		(3.04)	(-9.42)					
	DMRP	DSMB	DHML	DRMW	DCMA	DINVSENT		
Intl.	-	0.0083**	-0.2279***	-	-	-		
		(2.13)	(-9.41)					
	FMRP	FSMB	FHML	FRMW	FCMA	FINVSENT	Adjusted R-Squared	Standard Errors
	-	-	-	-	-	-	0.5700	CL - F & T
	DMRP	DSMB	DHML	DRMW	DCMA	DINVSENT	Adjusted R-Squared	Standard Errors
Domes.	-	0.0083**	-0.2279***	-	-	-	0.5728	CL - F & T
		(2.13)	(-9.41)					

Panel C: Global Financial Crisis - Taiwan

							Adjusted R-Squared	Standard Errors
	WMRP	WSMB	WHML	WRMW	WCMA	WINVSENT		
World	-2.2365	0.0111	0.0338	1.3082*	-1.3218***	-0.3336	0.093	CL-T
	(-1.43)	(0.97)	(0.66)	(1.95)	(-3.83)	(-0.82)		
	DMRP	DSMB	DHML	DRMW	DCMA	DINVSENT		
Intl.	-	-0.8351	0.1119	0.3573	-3.7926	4.3908		
		(-0.20)	(0.03)	(0.10)	(-1.60)	(0.93)		
	FMRP	FSMB	FHML	FRMW	FCMA	FINVSENT	Adjusted R-Squared	Standard Errors
	-3.1005*	0.0086	0.0303	1.2392*	-1.2192***	-0.4317	0.1141	CL-T
	(-1.87)	(0.74)	(0.67)	(1.87)	(-3.28)	(-0.75)		
	DMRP	DSMB	DHML	DRMW	DCMA	DINVSENT	Adjusted R-Squared	Standard Errors
Domes.	-	-5.0736	-1.9294	0.2661	-3.9374	-1.3734	0.0408	CL-T
		(-1.03)	(-0.43)	(0.05)	(-1.28)	(-0.33)		

Panel D: Euro Zone Crisis - China

							Adjusted R-Squared	Standard Errors
	WMRP	WSMB	WHML	WRMW	WCMA	WINVSENT		
World	26.1167***	0.5674	1.0705	-0.9651	-1.5607	1.0774	0.4164	CL-T
	(4.87)	(0.34)	(0.44)	(-0.56)	(-0.63)	(0.67)		
	DMRP	DSMB	DHML	DRMW	DCMA	DINVSENT		
Intl.	9.5071	2.9752	2.8040	-3.2981	-0.5924	6.3994*		
	(0.68)	(0.71)	(0.45)	(-1.34)	(-0.07)	(1.76)		
	FMRP	FSMB	FHML	FRMW	FCMA	FINVSENT	Adjusted R-Squared	Standard Errors
	43.2376**	2.0736	0.3059	0.4992	-3.5495	0.9083	0.3889	CL- T
	(2.18)	(0.51)	(0.07)	(0.08)	(-1.16)	(0.40)		
	DMRP	DSMB	DHML	DRMW	DCMA	DINVSENT	Adjusted R-Squared	Standard Errors
Domes.	31.2053***	2.3664	1.8242	-1.5965	0.7932	3.9868	0.2169	CL- T
	(2.60)	(0.90)	(0.26)	(-0.59)	(0.07)	(1.12)		

Panel E: Euro Zone Crisis - Hong Kong

	WMRP	WSMB	WHML	WRMW	WCMA	WINVSENT	Adjusted R-Squared	Standard Errors
World	-0.0658	-0.4125	0.6764	-0.5578**	-0.105	0.8336***	0.1130	CL-T
	(-0.06)	(-1.03)	(1.61)	(-2.12)	(-0.21)	(2.67)		
	DMRP	DSMB	DHML	DRMW	DCMA	DINVSENT		
Intl.	3.0393	0.3511	0.1568	-0.7089***	0.2691	1.0499***		
	(1.16)	(0.74)	(0.31)	(-2.80)	(0.59)	(3.14)		
	FMRP	FSMB	FHML	FRMW	FCMA	FINVSENT	Adjusted R-Squared	Standard Errors
	-1.7841	0.3283	2.8443***	-	-3.1693***	0.2402	0.1634	CL-T
	(-1.34)	(0.67)	(3.80)		(-3.04)	(0.35)		
	DMRP	DSMB	DHML	DRMW	DCMA	DINVSENT	Adjusted R-Squared	Standard Errors
Domes.	0.3623	0.2515	-0.1208	-0.5397*	-0.0479	0.8226**	0.0750	CL- T
	(0.20)	(0.45)	(-0.20)	(-1.73)	(-0.08)	(2.13)		

Panel F: Euro Zone Crisis - Taiwan

	WMRP	WSMB	WHML	WRMW	WCMA	WINVSENT	Adjusted R-Squared	Standard Errors
World	-0.2099	-0.4451**	1.0286	-0.4930*	-0.4095**	0.5574	0.3066	CL- T
	(-1.00)	(-2.22)	(0.95)	(-1.79)	(-2.35)	(0.10)		
	DMRP	DSMB	DHML	DRMW	DCMA	DINVSENT		
Intl.	17.1889***	6.2399**	-6.0161***	-1.1395	-5.3239**	-7.8361		
	(2.94)	(2.43)	(-2.71)	(-0.21)	(-2.05)	(-1.42)		
	FMRP	FSMB	FHML	FRMW	FCMA	FINVSENT	Adjusted R-Squared	Standard Errors
	-0.8000	-0.0390	1.0279**	-0.2848**	-0.6453	1.0325***	0.5249	CL- T
	(-0.98)	(-0.10)	(2.25)	(-2.21)	(-0.81)	(3.96)		
	DMRP	DSMB	DHML	DCMA	DRMW	DINVSENT	Adjusted R-Squared	Standard Errors
Domes.	4.6018	11.7985***	-3.3389***	-3.4895	-2.6305	1.6245	0.1968	CL- T
	(1.03)	(5.63)	(-2.58)	(-0.88)	(-0.91)	(0.39)		

Notes: Values in the parentheses are the t-statistics. *, **, *** significant at 10%, 5%, 1% respectively

Table 44 shows the regression results of monthly portfolio returns on market risk premium ./ excess market return (MRP), market capitalisation (SMB), book-to-market (HML), profitability factor (RMW), investment factor (CMA) and investor sentiment, under three models which examine the effect of integration – world, international and domestics. Panel A, Panel B and Panel C report the regression results of 25 portfolios of the China, Hong Kong and Taiwan stock markets during Global Financial Crisis. Panel D, Panel E and Panel F report the regression results of 25 portfolios of the China, Hong Kong and Taiwan stock markets during Euro Zone Crisis. Coefficients (t-statistics) are presented from the OLS using monthly cross section time series data for China, Hong Kong and Taiwan stock markets during Global Financial Crisis and Euro Zone Crisis. OLS regressions are presented for each of the stock market, where a separate regression is estimated for each of the model. The standard errors are estimated in the presence of a fixed firm effect (CL-F), a time effect (CL-T) and a fixed firm and time effect (CL – F&T).

In Hong Kong, the SMB factor has significant coefficients under the world model. The domestic SMB (DSMB) factor of the international model and domestic models exhibits marginally significant coefficint. As for the HML factor, it is negatively significant under the world model. Therefore, growth effect is observed. Further examination shows that the domestic HML (HML) is marginally significant under the international and domestics model. Growth effect is observed in the two model as well, as the coefficients are in negative.

The adjusted R-squared of the world, international and domestic models are 0.57, 0.57 and 0.57 respectively.

In Taiwan, the domestic market risk premium factor (DMRP) of the international model is weakly significant, with a negative coefficient. The SMB factor and the HML factor are insignificant under the three models. The investment factor of the world model (WCMA) and the foreign investment factor of the international model (FCMA) are significant. In addition, the profitability factor of the world model (WRMW) and the foreign investment factor of the international model (FRMW) are weakly significant.

The adjusted R-squared of the world, international and domestic models are 0.09, 0.11 and 0.04 respectively.

Euro Zone Crisis

The market risk premium factor (MRP) has shown significant positive coefficients in the China stock market under the world and domestic models. The foreign MRP (FMRP) of the international model is also significant, with positive coefficient.

The other three factors – SMB factor, HML factor and profitability factor are insignificant under the three models. However,the domestic INVSENT factor (DINVSENT) of the international model is weakly significant.

The adjusted R-squared of the world, international and domestic models are 0.42, 0.39 and 0.22 respectively.

In Hong Kong, the market risk premium factor (MRP) factor and the SMB factor are insignificant under the three models. The foreign HML factor (FHML) and the foreign investment factor (FCMA) of the international model are significant. As for the investment factor, it is negatively significant under the world model. The profitability factor is marginally significant under the world model. The domestic profitability factor (DRMW) of the international and domestic models are significant and weakly significant respectively. Lastly, the INVSENT factor is significant under the world model. The domestic INVSENT factor(DINVSENT) of the international and domestic models are significant and marginally significant respectively

The adjusted R-squared of the world, international and domestic models are 0.11, 0.16 and 0.08 respectively.

In Taiwan, the foreign market risk premium factor (FMRP) of the international model has significant coefficient. The SMB factor is marginally significant under the world model, with negative coefficient. Furthermore, the domestic SMB factor (DSMB) of the international and domestic models is marginally significant and significant, with positive coefficient. The foreign HML factor (FHML) as well as the domestic HML factor(DHML) of the international model are significant and marginally significant respectively. The domestic HML factor (DHML) of the domestic models is negatively significant. The investment factor of the world model (WCMA) and the domestic investment factor (DCMA) of the international model are marginally significant respectively. As for the profitability factor, it is weakly significant under the world model. The foreign profitability factor of the international model is marginally significant. Lastly, foreign INVESNT factor of the international model is positively significant.

The adjusted R-squared of the world, international and domestic models are 0.31, 0.52 and 0.20 respectively.

6.6 Empirical Discussion – China, Hong Kong and Taiwan Stock Markets

6.6.1 Noise augmented asset pricing model (based on Fama and French Three Factor Model)

Overall Firm

The market risk premium (MRP) is a significant factor, at 1% and 5% levels respectively in the Taiwan stock during the Global Financial Crisis and Euro Zone Crisis. The MRP factor has a coefficient of -5.0914 and -5.0180. The negative coefficients are with t-statistic values of -2.78 and -2.39. The empirical evidences suggest that the investors and traders carry out portfolio rebalancing activities in order to ensure the safety of the financial assets and mitigate losses. As equity is a riskier financial asset than the fixed income securities, these equity market participants were shorting equity especially and longing fixed income securities. On the other hand, it is a puzzle when the MRP factor in the China stock market has a high positive efficient of 18.8987 during the Euro Zone Crisis. The coefficient is with t-statistics value of 6.23, significant at 1% level. This phenomenon in the China stock market may be due to the market consists of a large proportion uninformed retail investors. Stein (2009) has argued that the level of sophistication of the investors would have an impact on the financial markets. These uninformed retail investors either do not have or lacking in the financial knowledge to rebalance portfolio during Euro Zone Crisis. However, the MRP factor is insignificant in the Hong Kong market during these two financial crises. Based on the empirical results, it is argued that the market risk premium (MRP) factor is a semi-strong signal.

The SMB factor has a coefficient of -2.1525 in the China stock market during the Global Financial Crisis. The t-statistic value is -1.93, significant at 10% level. Size effect is observed due to the negative coefficient. On the other hand, the SMB factor has a positively coefficient of 0.0028 in the Hong Kong stock market during Global Financial Crisis. The t-statistics value is 1.97, significant at 5% level. During the Euro Zone Crisis, the SMB factor is insignificant in the three stock markets of the Greater China region. As the cross sectional return does not fully captured the SMB factor in the three stock markets during the Global Financial Crisis and Euro Zone Crisis, it is argued that the SMB factor is a semi-strong signal.

During the Global Financial Crisis, the HML factor of the Hong Kong and Taiwan stock markets is significant at 1% level. The factor has a coefficient of -0.0829 and -0.7029 respectively. The t-statistics values are -9.39 and -2.66 respectively. Similar to the SMB factor, the HML factor is insignificant in the three stock markets of the Greater China region during the Euro Zone Crisis. As the cross sectional return does not fully captured the HML factor in the three stock markets during the Global Financial Crisis and Euro Zone Crisis, it is argued that the HML factor is a semi-strong signal.

The INVSENT factor has a coefficient of 0.2724 in the Hong Kong stock market during the Euro Zone Crisis. The t-statistics value is 2.51, significant at 5% level. This empirical result may be due to the fact that the Hong Kong stock market is a well-developed financial market and consists of a large proportion of institutional investors / money managers. However, the INVSENT factor is insignificant in the three stock markets of the Greater China region during the Global Financial Crisis. On these grounds, it is argued that the INVSENT factor is a weak signal.

Therefore, based on the empirical results, it is argued that market risk premium, the SMB factor and HML factor are semi-strong signals. In addition, the INVSENT factor is a weak signal. From the adjusted R-squared values observed, it is argued that there may be are other sources of systematic noise which may explain the stock returns.

Market Capitalisation

During the Global Financial Crisis, the market risk premium (MRP) factor of the Hong Kong stock market has a coefficient of -2.1796 in the small market capitalisation portfolios. The factor is significant at 5% level, with t-statistics value of -2.11. During the Euro Zone Crisis, the MRP factor is significant in the small market capitalisation portfolios of the Hong Kong and Taiwan stock markets at 5% levels. The coefficient of the MRP factor is -1.6286 and -4.4247 respectively. The t-statistics values are -2.29 and -1.96 respectively. Also, the MRP factor has a coefficient of -3.5789 in the big market capitalisation portfolio of the Taiwan stock market. The t-statistics value is -3.81, significant at 1% level. The negative coefficient of the significant factor may be due to the portfolio rebalancing activities of the traders and investors, so as to ensure safety of the financial assets and to mitigate possible loss. Hence, the MRP factor is considered to be a semi-strong signal.

During the Global Financial Crisis, the SMB factor of the small market capitalisation portfolios of the China stock market is significant at 1% level. The SMB factor has a coefficient of -1.1461 and the t-statistics value is -2.75. Size effect is observed, as the coefficient is negative. In addition, the SMB factor has a coefficient of 1.1725 in the big capitalisation portfolios of the Taiwan stock market. The t-statistics value is 3.75, significant at 1% level. During the Euro Zone Crisis, the SMB factor of the small market capitalisation portfolios in the China and Taiwan stock markets have a coefficient of -1.2493 and -0.5422 respectively. The t-statistics values are -2.32 and -2.80, significant at 5% and 1% level respectively. Size effect is observed, with the negative coefficient. In addition, the SMB factor of the big market capitalisation portfolios in the China and Taiwan stock markets has a coefficient of 0.6190 and 0.5123 respectively. The t-statistics values are 2.91 and 2.04, significant at 5% and 1% level respectively. As the cross sectional return does not fully captured the SMB factor in the three stock markets during the Global Financial Crisis and Euro Zone Crisis, it is argued that the SMB factor is a semi-strong signal.

During the Global Financial Crisis, the HML factor of the small market capitalisation portfolios of the China stock market is significant at 1% level. The SMB factor has a coefficient of 0.3929 and the t-statistics value is 3.45. However, the HML factor is insignificant in the small and big market capitalisation portfolios of the Hong Kong and Taiwan stock markets during the Global Financial Crisis. During the Euro Zone Crisis, the HML factor of the small market capitalisation portfolios of the Hong Kong stock market is significant at 5% level. The SMB factor has a coefficient of -0.2982 and the t-statistics value is -2.37. Also, the HML factor exhibit coefficient of 0.6484 and 0.2962 respectively for the big market capitalisation portfolio of the China and Hong Kong stock markets. The t-statistics values are 4.31 and 3.27 significant at 1% levels. The empirical evidence suggest that at the market capitalisation level, the cross sectional return of stock does not fully captured the HML factor in the three Great China stock markets during the two financial crises. Therefore, the HML factor is considered to be a semi-strong signal.

Lastly, the INVSENT factor is insignificant in both the small and big market capitalisation portfolios of the three stock markets during the Global Financial Crisis. However, the INVSENT factor of the small and big market capitalisation portfolios in the Hong Kong stock market has a coefficient of 0.3686 and 01925 respectively, significant at 1% and 5% levels. It is proposed that the INVSENT is to be considered as a weak signal.

In summary, it is concluded that that market risk premium, SMB factor and HML factors are semi-strong signals. However, INVSENT factor is to be classified as a weak signal.

Integration

During the Global Financial Crisis, the domestic market risk premium factor (DMRP) of the international model in the China and Hong Kong stock markets are significant at 10% and 1% level. The MRP factor has a coefficient of 6.5927 and-0.1821 respectively, with the t-statistic values of 1.70 and -13.89. However, the foreign market risk premium factor (FMRP) of the international model in the Taiwan stock market is significant at 10% level. The FMRP factor has a coefficient of -3.5828. The t-statistic value is -1.67. The empirical evidence suggest the in the Hong Kong stock market, the traders and investor rebalanced their portfolio, these equity market participants were shorting equity especially and longing fixed income securities in the domestic market. However, the China stock market which consists of largely uninformed traders, still invest in the domestic equity market, to a lesser extent. Finally, the players in the Taiwan stock market also rebalanced their portfolio - shorting equity especially and longing fixed income securities, but in the foreign market

During the Euro Zone Crisis, the market risk premium factor of the China stock market has a coefficient of 24.7155 and 29.4737 under the world and domestic models. The t-statistics values are 7.14 and 2.18 respectively, significant at 1 % and 5 levels Furthermore, the foreign market risk premium factor (FMRP) of the international model has a coefficient of 45.1145 and a t-statistic value of 2.26, significant at 5% level. . The empirical results suggest that both the portfolio rebalancing activities are carried out at the regional and domestic capital markets. Furthermore, the foreign market risk premium factor (FMRP) of the international model in the Hong Kong stock market has a coefficient of -3.5857 and a t-statistic value of -2.60 significant at 1% level. In Taiwan stock market, however, the market risk premium factor stock market has a coefficient of 13.8692 under the domestic model. The t-statistics value is 2.52, significant at 5 % level. It appears that the institutional investors / smart money managers which are the main players in the Hong Kong stock market rebalanced the portfolios in the foreign market. On the other hand, the market participants in the Taiwan stock market managed their portfolios in the domestic market. It is suggested that the market risk premium factor (MRP) is a semi-strong signal.

During the Global Financial Crisis, the domestic SMB (DSMB) factor of the international and domestic models of the China stock market is significant at 5% and 10% levels respectively. The domestic SMB factor has a coefficient of -4.2164 and -4.2689 respectively. The t statistic values are -2.00 and -1.84, significant at 1% and 5%. The results suggest that the size effect is stronger in the domestic China stock market, with the negative coefficient. Furthermore, the SMB factor of the Hong Kong stock market has a coefficient of 0.0117 and 0.0083 respectively under the world and domestic models. The t statistic values are 3.04 and 2.13, significant at 1% and 5% levels. Lastly, the SMB factor of the Taiwan stock market has a coefficient of 0.0201. The t-statistics value is 1.69, significant at 10% level. During the Euro Zone Crisis, the SMB factor is insignificant in the China and Hong Kong stock markets. In the Taiwan stock market, the domestic SMB (DSMB) factor of the international and domestic models has a coefficient of 6.6280 and 10.7952. The t-statistic values are 1.98 and 6.41, significant at 5% and 1% levels. The empirical analysis above suggests that at the integration level, the cross sectional of stock return does not fully captured the SMB factor. Hence, it is proposed that the SMB factor is to be classified as a semi-strong signal.

During the Global Financial Crisis, the HML factor of the world and domestic models in the Hong Kong stock market is significant at 1% level. The HML factor has a coefficient of -0.2251 and -0.2279 respectively. The t-statistics values are -9.42 and -9.41, significant at 1% level. In addition, the domestic HML (DHML) factor of the international model has a coefficient of 0.0083. The t-statistics value is 2.13, significant at 5% level. However, the HML factor is insignificant in the China stock market. In the Taiwan stock market, the domestic HML (DHML) factor of the international and domestic models has a coefficient of -6.9898 and -5.5242. The t-statistic values are -2.30 and -1.85 respectively. During the Euro Zone Crisis, the HML factor is insignificant in the China stock market. As for the Hong Kong stock market, the foreign HML factor of the international model has a coefficient of 1.0668. The t-statistics value is 2.11, significant at 5% level. Furthermore, the HML factor of the Taiwan stock market has a coefficient of 0.8695 and -4.255 respectively under the world and domestic models. The t-statistics values are 2.22 and -3.72, significant at 5% and 1% respectively. Also, the domestic HML factor of the international model has a coefficient of -6.5602. The t-statistics value is -2.08, significant at 5% level. The empirical evidence suggests that at the integration level, the cross sectional of stock return does not fully captured the HML factor. Therefore, it is proposed that the HML factor is to be considered as a semi-strong signal.

During the Global Financial Crisis, the domestic INVSENT factor of the international model of the China and Hong Kong stock markets has a coefficient of 1.0369 and -0.2279 respectively. The t-statistical values are 1.68 and -9.41, significant at 10% and 1% respectively. The empirical evidences suggest that the Hong Kong stock market which consist of a large proportion of institutional investors / money managers are influenced by the domestic investor sentiment factor. Also, the China stock markets are also influenced by the same factor, but a less extent.

During the Euro Zone Crisis, the foreign investor sentiment factor (FINVSENT) of the international model in the Chinia stock market has a coefficient of 2.8365 and the t-statistics value is 1.76, significant at 10% level. In addition, the INVESENT factor is significant in the world model, at 1 % level. The coefficient and t-statistics value are 0.9249 and 2.63 respectively. The research also documents significant domestic INVSENT factor (DINVSENT) at 1% level for the international and domestic models. The coefficient of the domestic INVSENT factor (DINVSENT) under the international and domestic models is 1.1157 and 0.8098. The t-statistics values are 3.56 and 2.68 respectively. The results suggest that the domestic INVSENT factor and world INVSENT factor are prominent in the Hong Kong stock market during the Euro Zone Crisis. In the Taiwan stock market, the INVESNT factor has a coefficient of 0.6810 and the t-statistics value of 1.88 (significant at 10% level) under the world model. In addition, the foreign INVSENT (FINVSENT) factor of the international model has a coefficient of 1.0209. The t-statistics value is 3.23, significant at 1% level. The empirical evidence suggests that at the integration level, the cross sectional of stock return does not fully captured the INVSENT factor. Therefore, it is proposed that the INVSENT factor is to be considered as a semi-strong signal.

The size of the adjusted R-squared has improved in the China and Taiwan stock markets from the Global Financial Crisis to the Euro Zone Crisis. However, this observation is not noticed in the Hong Kong stock market from Global Financial Crisis to the Euro Zone Crisis. This may be due to high proportion of institutional investors in the Hong Kong stock market, compared to the other two stock markets. As described earlier, the INVSENT factor is the proxy for systematic noise caused by individual retail investors.

In summary, it is concluded that at the market integration level, market risk premium, SMB factor, HML factors and INVSENT factor are semi-strong signals. From the adjusted R-squared values observed, it is argued that there are other sources of systematic noise which may explain the stock returns.

6.6.2 Noise augmented asset pricing model (based on Fama and French Five Factor Model)

Overall /Firm

The market risk premium (MRP) factor is significant at 1% and 5% level respectively in the Taiwan stock market during the Global Financial Crisis and Euro Zone Crisis. The MRP factor has a coefficient of -4.0858 and -4.8645.The t-statistics values are -2.57 and -2.22. Furthermore, the MRP factor is significant at 1% level in the China stock market during Euro Zone Crisis, with a coefficient of 19.2552 and t-statistics value of 5.26.From the empirical evidence, it is suggested that the traders and investors of the Taiwan stock market were involved in portfolio rebalancing activities - shorting equity especially and longing fixed income securities. As the equities represent a riskier investment than the fixed income securities, the portfolio rebalancing activities were to ensure safety of the financial assets. However, the observation of positive coefficient of the MRP factor in the China stock market during the Euro Zone Crisis may be the results of the trading approach or strategy of the uninformed retail investors. It is an issue of level of sophistication of the investors (Stein, 2009) in the China stock market. It is a common knowledge that a large proportion of the players in the China stock market are uninformed retail investors. They either do not have or lacking in the financial knowledge to make the necessary adjustment and changes in their investing decisions during Euro Zone Crisis. Based on the empirical results, it is argued that the market risk premium (MRP) factor is a semi-strong signal.

During the Global Financial Crisis, the SMB factor has a coefficient of -2.3562 and 0.0028 in the China and Hong Kong stock markets respectively. The t-statistical values are -2.07 and 1.97, significant at 5% level in both instances. With the negative coefficient in the China stock market, size effect is observed. On the SMB factor is insignificant in the three stock markets during the Euro Zone Crisis. The empirical results have provided evidence that the cross sectional return of stock does not fully captured the SMB factor in the three Great China stock markets during the two financial crises. Hence, it is suggested that the SMB factor is a semi-strong signal.

During the Global Financial Crisis, the HML factor of the Hong Kong and Taiwan stock markets has a coefficient of -0.0829 and -0.7221 respectively. The t-statistics values of these two stock markets are 9.39 and -1.74, significant at 1% and 10% respectively. Growth effect is observed as the coefficients are negative. On the other hand, the HML factor is insignificant in the three stock markets during the Euro Zone Crisis. The empirical results have provided evidence that the cross sectional return of stock does not fully captured the HML factor in the three Great China stock markets during the two financial crises. Hence, it is suggested that the HML factor is a semi-strong signal.

The profitability factor (RMW) and investment factor (CMA) are insignificant statictically in the three stock markets during both the financial crises.

As for the INVSENT factor, it is significant at 10% level in the Hong Kong and Taiwan stock markets during the Euro Zone Crisis. The INVSENT has a coefficient of 0.1982 and 0.6619. The t-statistics values are 1.84 and 1.80 respectively. One possible explanation that the INVSENT is significant during the Euro Zone Crisis, although to a lesser extent, is due to the learning effects of the investors.**

Consistent with the argument of the Fama and French Three Factor model, the research argues that the risk measures of the Fama and French Five Factor Model do not fully explain the value premium phenomenon of the China, Hong Kong and Taiwan stock market during the Global Financial Crisis and Euro Zone Crisis. The market risk premium (MRP) factor, SMB factor and HML factor are considered to be semi-strong signals. However, the profitability factor (RMW) and investment factor (CMA) are insignificant. Finally, the INVSENT factor is a weak signal as it exhibits rather low level of significance during the Euro Zone Crisis.

Market Capitalisation

During the Global Financial Crisis, the market risk premium (MRP) factor of the Hong Kong stock market is significant at 10% and 5% levels for the small and big market capitalisation portfolios respectively. The coefficient of the market risk premium (MRP) factor is -1.5900 and -2.0869. The t-statistics values are -1.73 and -2.56. During the Euro Zone Crisis, the MRP factor is significant in the small market capitalisation portfolios of the Hong Kong and Taiwan stock markets at 5% levels. The coefficient of the MRP factor is -1.6656 and -3.9684 respectively. The t-statistics values are -2.16 and -2.32. Also, the MRP factor is significant at 1% level in the big market capitalisation portfolio of the Taiwan stock market. The factor has a coefficient -4.0968. The t-statistics value is -2.80. The negative coefficient of the significant factor suggests that the traders and investors rebalanced their portfolio, in order to ensure safety of the financial assets and to mitigate possible loss. Hence, the MRP factor is considered to be a semi-strong signal.

During the Global Financial Crisis, the SMB factor of the small market capitalisation portfolios of the China stock market has a coefficient of -0.9433 and the t-statistics value is -2.17. The factor is significant at 5% level. Size effect is observed, as the coefficient is negative. However, the SMB factor is insignificant in the big capitalisation portfolios of the three stock markets.

During the Euro Zone Crisis, the SMB factor of the small market capitalisation portfolios in the China and Taiwan stock markets have a coefficient of -1.4909 and -0.6348 respectively. The t-statistics values are -1.85 and -2.52, significant at 10% and 5% level respectively. Size effect is observed, with the negative coefficient. In addition, the SMB factor of the big market capitalisation portfolios in the China has a coefficient of 1.1119. The t-statistics value is 2.59, significant at 1% level. As the cross sectional return does not fully captured the SMB factor in the three stock markets during the Global Financial Crisis and Euro Zone Crisis, it is argued that the SMB factor is a semi-strong signal.

During the Global Financial Crisis, the HML factor is insignificant in both the small and market capitalisation portfolios of the three stock markets. During the Euro Zone Crisis, the HML factor of the small market capitalisation portfolios of the China and Hong Kong stock markets has a coefficient of -0.4726 and -0.3130. The t-statistics values are -1.85 and -2.52 respectively, significant at 10% and 1% levels. As for the big market capitalisation portfolios, the HML factor exhibit coefficient of 0.6318 in the China stock market. The t-statistics value is 3.86, significant at 1% levels. The empirical evidence suggest that at the market capitalisation level, the cross sectional return of stock does not fully captured the HML factor in the three Great China stock markets during the two financial crises. Therefore, the HML factor is considered to be a semi-strong signal.

During the Global Financial Crisis, the profitability factor (RMW) is significant at 1% level on in the big market capitalisation portfolios of the Taiwan stock market. The RMW factor has a coefficient of 2.1580. The t-statistics value is 6.15, significant at 1% level. During the Euro Zone Crisis, the profitability factor (RMW) of the small market capitalisation portfolios of the China and Taiwan stock markets has a coefficient of 10.5839 and 1.2860. The t-statistic values are 1.65 and 3.73, significant at 10% and 1% respectively. As for the big market capitalisation portfolios, the coefficient in the Taiwan stock market is significant at 1% level. The coefficient is 3.1164 and the t-statistical value is 4.86. The empirical evidence shows that at the market capitalisation level, the cross sectional return of stock does not fully captured the profitability factor (RMW) in the three Great China stock markets during the two financial crises. Therefore, the profitability factor is considered to be a semi-strong signal.

During the Global Financial Crisis, the investment factor (CMA) is significant at 5% level on the small market capitalisation portfolios of the Hong Kong stock market. The investment has a coefficient of -0.7809 and t-statistics value of -2.16. As for the big market capitalisation portfolios, the CMA factor is significant at 1% in the Hong Kong and Taiwan stock markets. The CMA factor has a coefficient of -1.4372 and -2.1870 respectively. The t-statistic values are -5.83 and -4.23. During the Euro Zone Crisis, the investment factor (CMA) is significant at 1% level on the small market capitalisation portfolios of the China and Taiwan stock markets respectively. The investment has a coefficient of -1.0526 and -1.8950. Whereas, the t-statistics values are -4.76 and -3.96. As for the big market capitalisation portfolios, the investment factor (CMA) is significant at 1% level of the Taiwan stock market. The coefficient is 2.4662 and the t-statistic value is -5.66. As the empirical evidence shows that the cross sectional return of stock does not fully captured the investment factor (CMA) in the three Great China stock markets during the two financial crises. Hence, it is argued that the investment factor (CMA) is to be classified as a semi-strong signal.

Although the INVSENT factor is insignificant in both the small and big market capitalisation portfolios of the three stock markets during the Global Financial Crisis, the INVSENT factor is significant in the both small and big market capitalisation portfolios of the Hong Kong and Taiwan stock markets. As for the small market capitalisation portfolios, the INVSENT has a coefficient of 0.2362 and 0.5428 in the Hong Kong and Taiwan stock markets respectively. The t-statistic values are 1.97 and 9.25, significant at 5% and 1%. On the other hand, the INVSENT has a coefficient of 0.2122 and 0.4942 in the big market capitalisation portfolios of the Hong Kong and Taiwan stock markets respectively. The t-statistic values are 2.06 and 1.78, significant at 5% and 1%. The empirical evidence documents that the cross sectional return of stock does not fully captured the INVSENT factor in the three Great China stock markets during the two financial crises. Therefore, it is argued that in the context of market capitalisation, the INVESENT factor is to be considered as a semi-strong signal.

Based on the empirical results, analysis and discussion, it is concluded that that market risk premium, SMB factor, HML factor, profitability factor (RMW), investment factor (CMA) and INVSENT factor are semi-strong signals. From the adjusted R-squared values observed, it is argued that there are other sources of systematic noise which may explain the stock returns.

Integration

During the Global Financial Crisis, the domestic market risk premium factor (DMRP) of the international model in the China stock market is significant at 5% level. The factor has a coefficient of 7.5722 and the t-statistic value is 2.33.The empirical evidence suggests the investors and traders of the China stock market, to a larger extent, continue to hold the financial assets in the domestic market. In addition, the foreign market risk premium factor (FMRP) of the international model in the China and Taiwan stock markets has a coefficient of -4.6499 and -3.1005. The t-statistic values are -1.87 and -1.87 respectively, significant at 10% level. This result implies that to a lesser extent, the market participants of China and Taiwan stock markets rebalanced their portfolios in the foreign markets, shorting equity especially and longing fixed income securities in order to ensure the safety of the financial assets.

During the Euro Zone Crisis, the market risk premium factor of the China stock market has a coefficient of 26.1167 and 31.2053 under the world and domestic models. The t-statistics values are 4.87 and 2.60 respectively, significant at 1 % level. It appears that suggest that the portfolio rebalancing activities are carried out at the regional and domestic capital markets. Furthermore, the domestic market risk premium (DMRP) factor of the Taiwan stock market has a coefficient of 17.1889 under the international model. The t-statistics value is 2.94, significant at 1 % level. This result provides evidence that the portfolio rebalancing decision in Taiwan during the Euro Zone Crisis is carried out in the domestic financial market. The empirical evidence shows that at the integration level, the cross sectional return of stock does not fully captured the market risk premium factor (MRP) in the three Great China stock markets during the two financial crises. Therefore, the MRP factor is considered to be a semi-strong signal.

During the Global Financial Crisis, the domestic SMB (DSMB) factor of the international and domestic models of the China stock market is significant at 5% level. The DSMB factor has a coefficient of -3.8629 and -4.4056 respectively. The t statistic values are -2.48 and -2.06, significant at 5% levels. As the coefficients are negative, the results suggest that the size effect is stronger in the domestic China stock market. Similarly, the domestic SMB (DSMB) factor of the international and domestic models of the Hong Kong stock market is also significant at 5% levels. The coefficients of the DSMB factor for these two markets are 0.0083 and 0.0083 respectively. The t statistic values are 2.13 and 2.13. In addition, the SMB factor the world model is significant at 1% level. The coefficient is 0.0117 and the t –statistic value is 3.04. However, the SMB factor is insignificant statistically in the Taiwan stock market during the Global Financial Crisis. Also, the SMB factor is insignificant in the China and Hong Kong stock markets during the Euro Zone Crisis. In the Taiwan stock market, the SMB factor has a coefficient of -0.4451. The t-statistical value is -2.22, significant at 5% level. Further analysis reveals that the domestic SMB (DSMB) factor of the international and domestic models is significant at 5% and 1% respectively. The coefficients of the DSMB factor are 6.2399 and 11.7985. The t-statistic values are 2.43 and 5.63. The empirical analysis above suggests that at the integration level, the cross sectional of stock return does not fully captured the SMB factor. Hence, it is proposed that the SMB factor is to be classified as a semi-strong signal.

During the Global Financial Crisis, the HML factor of the world model in the Hong Kong stock market is significant at 1% level. It has a coefficient of -0.2251 and t-statistics value is -9.42. In addition, the domestic HML factor of the international and domestic models are also significant at 1% level. The coefficient is -0.2279 for both the models. The t-statistics value is -9.41. As the coefficient is negative, the growth effect is observed. On the other hand, HML factor is insignificant statistically in both the China and Taiwan stock markets during the Global Financial Crisis. During the Euro Zone Crisis, the foreign HML factor of the international model in the Hong Kong stock market is significant at 1% level. It has a coefficient of 2.8443 and the t-statistics value is 3.80. As for the Taiwan stock market, the domestic HML (DHML) factor is significant at 1% under the international and domestic models respectively. In this instance, the DHML factor has a coefficient of -6.0161 and -3.3389. The t-statistics values are - 2.71 and -2.58. The empirical evidence suggests that at the integration level, the cross sectional of stock return does not fully captured the HML factor. Hence, it is proposed that the HML factor is to be considered as a semi-strong signal.

During the Global Financial Crisis, the profitability factor (RMW) is significant in the world model of the Taiwan stock market is significant at 10% level. It has a coefficient of 1.3082 and the t-statistics value is 1.95. Furthermore, the foreign profitability factor (FRMW) of the international model has a coefficient of -1.2392. The t-statistic value is -1.87, significant at 10 % level. The factor, however, is insignificant statistically in the China and Hong Kong stock markets during the Global Financial Crisis. During the Euro Zone Crisis, the profitability factor (RMW) of the Hong Kong stock market is significant under the world and domestic models at 5% and 10% levels. The coefficients are -0.5578 and -0.5397 respectively. The t-statistics values are -2.12 and -1.73. In addition, the domestic profitability factor (DRMW) of the international model in the Hong Kong stock market has a coefficient of -0.7089. The t-statistics value is -2.80, significant at 1 % level. As for the Taiwan stock market, the profitability factor (RMW) is significant at 10% under the world model. The coefficient is -0.4930 and the t-statistics value is -1.79. Also, the foreign profitability factor (FRMW) of the international model of the Taiwan stock market has a coefficient of -0.2848. The t-statistics value is -2.21, significant at 5 % level. However, the profitability factor is insignificant statistically in the China stock market during the Euro Zone Crisis. The empirical evidence above shows that the cross sectional of stock return does not fully captured the profitability factor. In the context market capitalisation, the profitability (RMW) factor is therefore considered to be a semi-strong signal.

During the Global Financial Crisis, the investment factor (CMA) of the China stock market is statistically significant at 1% and 5% for the world and domestic models respectively. The coefficients are -1.2882 and -4.2876, whereas the t-statistics values are -3.16 and -1.98. Also, foreign profitability factor (FRMW) of the international model of the China stock market has a coefficient of -0.9474. The t-statistics value is 2.73, significant at 1 % level. In the Taiwan stock market, the investment factor (CMA) is significant at 1% level under the world model. The coefficient is -1.3218 and the t-statistics value is 3.83. . Also, the foreign investment factor (FCMA) of the international model of the Taiwan stock market is significant at 1% level. It has a coefficient of -1.2192. The t-statistics value is -3.28. During the Euro Zone Crisis, the foreign investment factor (FCMA) of the international model of the Hong Kong stock market is significant at 1% level. It has a coefficient of -3.1693. The t-statistics value is -3.03. In the Taiwan stock market, the investment factor (CMA) is significant at 5% level under the world model. The coefficient is -0.4095 and the t-statistics value is-2.35. Also, the domestic investment factor (DCMA) of the international model of the Taiwan stock market is significant at 5% level. It has a coefficient of -5.3239. The t-statistics value is -2.05. As the cross sectional of stock return does not fully captured the investment factor (CMA), it is proposed that the investment (CMA) factor is to be classified as a semi-strong signal.

Although the INVSENT factor is not significant statistically in the three stock markets of the Greater China region during the Global Financial Crisis, the factor is significant in the Hong Kong stock market especially during the Euro Zone Crisis. In this context, the INVSENT factor is significant at 1 % level under the world model. The coefficient is 0.8336 and the t-statistics value is 2.67. In addition, the domestic INVSENT factor is also significant at 1% level and 5% level respectively under the international and domestic models. The coefficients are 1.0499 and 0.8226, whereas the t-statistics values are 3.14 and 2.13. The evidence suggests that in the case of Hong Kong, the investor sentiment of the domestic market is one factor which can explain cross section of stock return during the Euro Zone Crisis. As for the Taiwan stock market, the foreign INVSENT (FINVSENT) factor of the international model is statistically significant at 1% level. The coefficient is 1.0325 and t-statistics value is 3.96. It appears that the investor sentiment of the foreign, rather than the domestics market is the one which explain the cross section of stock return of the Taiwan stock market during the Euro Zone Crisis. In the context of market integration, it is proposed that the INVSENT factor is to be considered as a semi-strong signal.

The empirical evidences suggested that risk measures of the Fama and French Five Factor Model do not fully explain the value premium phenomenon in the context of market integration for the Greater China stock markets during the two major financial crises. These factors – market risk premium, SMB factor, HML factor, profitability factor and investment factor are considered to be semi-strong signals. On the whole, the INVSENT factor is also to be treated as a semi-strong signal, especially when it is a prominent factor in the Hong Kong stock market during the Euro Zone Crisis.

The size of the adjusted R-squared has improved in the Taiwan stock market from the Global Financial Crisis to the Euro Zone Crisis. On the other hand, it has deteriorated in the Hong Kong Taiwan stock market from the Global Financial Crisis to the Euro Zone Crisis.

Considering the mixed results of adjusted R-squared value and varying signals of the factors, it is suggested that the risk measures of the Fama and French Five Factor Model do not fully explain the value premium phenomenon in the context of market integration for the Greater China stock markets during the two major financial crises. It is argued that there are other sources of systematic noise which may explain the stock returns.

6.6.3 Global Financial Crisis - Comparion between (i) Noise augmented asset pricing model (based on Fama and French Three Factor Model) and (ii) Noise augmented asset pricing model (based on Fama and French Five Factor Model)

In this section, discussion is made on the comparison of the two models - (i) Noise augmented asset pricing model (based on Fama and French Three Factor Model) and (ii)) Noise augmented asset pricing model (based on Fama and French Five Factor Model) in addressing the research objective for the Global Financial Crisis.

Overall Firm

The empirical results at the overall firm level provide insight on the similarity of market risk premium (MRP) factor, SMB factor and HML factor, in terms of level of significance, under the noise-augmented asset pricing model based on Fama and French Three Factor Model and noise augmented asset pricing model based on Fama and French Five Factor Model. As for the market risk premium factor, it is significant at 1 % level in the Taiwan stock market. In addition, the SMB factor is significant at 5% level in the Hong Kong stock market. The SMB factor is significant at 10% and 5% level in the China stock market, under the noise-augmented asset pricing model based on Fama and French Three Factor Model and noise augmented asset pricing model based on Fama and French Five Factor Model respectively. Also, the HML factor is significant in the Hong Kong stock market at 1% level. However, the HML factor is significant at 1% level in the Taiwan stock market, under the noise-augmented asset pricing model based on Fama and French Three Factor Model, but significant at 10% under the noise augmented asset pricing model based on Fama and French Five Factor Model. The profitability factor (RMW) and investment factor (CMA) are insignificant statistically under the noise augmented asset pricing model based on Fama and French Five Factor Model. The INVSENT factor is insignificant under both the models. Lastly, the adjusted R-squared values of the three stock markets are slightly higher in the noise augmented asset pricing model based on Fama and French Five Factor Model than noise augmented asset pricing model based on Fama and French Three Factor Model

Market Capitalisation

At the market capitalisation level, the market risk premium (MRP) factor is significant at 5% and 10% level respectively, in the small market capitalisation portfolios of the Hong Kong stock markets for noise augmented asset pricing model based on Fama and French Three Factor Model and noise augmented asset pricing model based on Fama and French Five Factor Model. The SMB factor is significant at 1% and 5% levels respectively, in the small market capitalisation portfolios of the China stock markets for noise augmented asset pricing model based on Fama and French Three Factor Model and noise augmented asset pricing model based on Fama and French Five Factor Model. However, the HML factor is significant at 1% level in the small market capitalisation portfolios of the China stock markets only for the noise augmented asset pricing model based on Fama and French Three Factor Model. The profitability factor of the noise augmented asset pricing model based on Fama and French Five Factor Model is insignificant statistically in the three stock markets of the Greater China region during the Global Financial Crisis. The other factor of the model – the investment factor (CMA) is significant at 5% level in the small market capitalisation of the China stock market. The INVSENT factor is insignificant under both the models. As for the big market capitalisation portfolios, the MRP factor is significant at 5% in the Hong Kong stock market only under the noise augmented asset pricing model based on Fama and French Five Factor Model, whereas the SMB factor is sig significant at 1% in the Taiwan stock market only under the noise augmented asset pricing model based on Fama and French Three Factor Model. The HML factor and INVSENT factor are insignificant statistically under both the models. Under the noise augmented asset pricing model based on Fama and French Five Factor Model, the profitability factor (RMW) is significant at 1% level on in the big market capitalisation portfolios of the Taiwan stock market. Also, the CMA factor is significant at 1% in the Hong Kong and Taiwan stock markets. Lastly, the adjusted R-squared values of the three stock markets are generally higher in the noise augmented asset pricing model based on Fama and French Five Factor Model than noise augmented asset pricing model based on Fama and French Three Factor Model

Market Integration

At the market integration level, the domestic MRP factor (DMRP) is significant in the world model of the China stock market under both the model. In addition, the foreign MRP factor (FMRP) of the international model is also significant at 10% level under both the models. However, the domestic MRP factor (DMRP) of the international model is significant at 1% level in the Hong Kong stock market under the noise augmented asset pricing model based on Fama and French Three Factor Model. Also, the foreign MRP factor (FMRP) of the international model is significant at 10% level in the China stock market under the noise augmented asset pricing model based on Fama and French Five Factor Model.

The domestic SMB factor is significant in the international and domestic models of the China stock market under both the noise augmented asset pricing models. In the Hong Kong stock market, the SMB factor of the world model and domestic model is significant at 1% and 5% respectively under both the noise augmented asset pricing models. In addition, the foreign SMB factor of the international model is significant at 5% level under the noise augmented asset pricing model based on Fama and French Five Factor Model. In the Taiwan stock market, the SMB factor of the world model is significant under both the noise augmented asset pricing models. Furthermore, the domestic SMB factor (DSMB) factor of the international and domestic model is significant at 5% level under the noise augmented asset pricing model based on Fama and French Five Factor Model.

The HML factor is significant in the world model of the Hong Kong stock market under both the noise augmented asset pricing models. Furthermore, the domestic HML (DHML) factor of the international and domestic models of the Hong Kong stock market is significant under both the noise augmented asset pricing models as well. In Taiwan, the domestic HML (DHML) factor of the international and domestic models is significant at 5% and 1% respectively under noise augmented asset pricing model based on Fama and French Three Factor Model.

Under the noise augmented asset pricing model based on Fama and French Five Factor Model, the profitability factor (RMW) is significant in the world model of the Taiwan stock market at 10% level. Furthermore, the foreign profitability factor (FRMW) is significant at 10 % level. The factor, however, is insignificant statistically in the China and Hong Kong stock markets during the Global Financial Crisis. In addition, the investment factor (CMA) of the China stock market is statistically significant at 1% and 5% for the world and domestic models respectively. Also, foreign profitability factor (FRMW) of the international model of the China stock market is significant at 1 % level. In the Taiwan stock market, the investment factor (CMA) is significant at 1% level under the world model. Furthermore, the foreign investment factor (FCMA) of the international model of the Taiwan stock market is significant at 1% level.

The INVSENT factor is insignificant in the three stock markets under the noise augmented asset pricing model based on Fama and French Five Factor Model. However, the domestic INVSENT (DINVSENT) factor of the international model in the China and Hong Kong stock market is statistically significant at 10% and 1% level respectively under the augmented asset pricing model based on Fama and French Three Factor Model

Lastly, the adjusted R-squared values of the three stock markets are generally higher in the noise augmented asset pricing model based on Fama and French Five Factor Model than noise augmented asset pricing model based on Fama and French Three Factor Model.

6.6 4 Euro Zone Crisis - Comparion between (i) Noise augmented asset pricing model (based on Fama and French Three Factor Model) and (ii) Noise augmented asset pricing model (based on Fama and French Five Factor Model)

In this section, discussion is made on the comparison of the two models - (i) Noise augmented asset pricing model (based on Fama and French Three Factor Model) and (ii)) Noise augmented asset pricing model (based on Fama and French Five Factor Model) in addressing the research objective for the Euro Zone Crisis.

Overall Firm

The empirical results at the overall firm level shows that the market risk premium (MRP) factor is significant at 1% and 5% level in the China and Taiwan stock markets respectively, under both the models. However, the SMB and HML factors are insignificant statistically under both the models. Under the noise augmented asset pricing model based on Fama and French Five Factor Model, the profitability factor (RMW) and investment factor (CMA) are insignificant. As for the INVESENT factor, it is significant at 5% and 10% levels respectively under the noise augmented asset pricing model based on Fama and French Three Factor Model and noise augmented asset pricing model based on Fama and French Five Factor Model respectively. The INVSENT factor is also at 10% level under the noise augmented asset pricing model based on Fama and French Five Factor Model. Lastly, the adjusted R-squared values of the three stock markets are slightly higher in the noise augmented asset pricing model based on Fama and French Five Factor Model than noise augmented asset pricing model based on Fama and French Three Factor Model.

Market Capitalisation

At the market capitalisation level, the market risk premium factor of the small market capitalisation portfolios of the Hong Kong and Taiwan stock markets is significant at 5% level under both the models. In addition, the SMB factor is also significant for the small market capitalisation portfolios of the China and Taiwan stock markets under both the models. As for the HML factor, it is significant at 5% in the small capitalisation portfolios of the Hong Kong stock markets under the noise augmented asset pricing model based on Fama and French Three Factor Model. The HML factor, however, is significant at 10% and 1 % level under the in the small capitalisation portfolios of the China and Hong Kong stock markets under the noise augmented asset pricing model based on Fama and French Five Factor Model. The profitability factor (RMW) of the small market capitalisation portfolios of the China and Taiwan stock markets is significant at 10% and 1% respectively. Also, the investment factor (CMA) is significant at 1% level on the small market capitalisation portfolios of the China and Taiwan stock markets respectively. The INVSENT factor is significant in the small market capitalisation portfolios of the Hong Kong stock market under both the models. In addition, the INVSENT factor is also significant at 1% level on the small market capitalisation portfolios of the Taiwan stock market. Lastly, the adjusted R-squared values of the three stock markets are generally higher in the noise augmented asset pricing model based on Fama and French Five Factor Model than noise augmented asset pricing model based on Fama and French Three Factor Model. As for the big market capitalisation portfolios, the market risk premium factor (MRP) is significant at 1% level in the Taiwan stock market under both the models. The SMB factor is also significant at 1% level in the China stock market under both the models. Furthermore, the SMB factor is significant at 5 % level in the Taiwan stock market under the noise augmented asset pricing model based on Fama and French Three Factor Model. Similarly, the HML factor is significant at 1% level in the China stock market under both the models. The HML factor is also significant at 1 % level in the Hong Kong stock market under the noise augmented asset pricing model based on Fama and French Three Factor Model. The profitability factor (RMW) and the investment factor (CMA) are significant at 1% level in the big market capitalisation portfolios of the Taiwan stock market under the noise augmented asset pricing model based on Fama and French Five Factor Model. Lastly, the INVSENT factor is significant at 5% level in the big market capitalisation portfolios of the Hong Kong stock market under both the models. In addition, the factor is also significant at 10% level in the big market capitalisation portfolios of the Taiwan stock market under the noise augmented asset pricing model based on Fama and French Five Factor Model. Lastly, the adjusted R-squared values of the three stock markets are generally higher in the noise augmented asset pricing model based on Fama and French Five Factor Model than noise augmented asset pricing model based on Fama and French Three Factor Model .

Market Integration

At the market integration level, the market risk premium (MRP) factor of the world and domestic model is significant at 1% level in the China stock market under both the noised augmented asset pricing models. In addition, the foreign MRP factor (FMRP) of the international model is also significant under both the models. Furthermore, the domestic MRP factor (DMRP) of the international model in Taiwan stock market is significant under both the noised augmented asset pricing models. However, the foreign MRP factor (FMRP) of the international model in the Hong Kong stock market is significant at 1% level under the noise augmented asset pricing model based on Fama and French Five Factor Model.

In Taiwan, the domestic SMB factor of the international and domestic models is significant statistically under both the noise-augmented asset pricing models. Also, the SMB factor is statistically significant at 5% level under the noise augmented asset pricing model based on Fama and French Five Factor Model. However, the SMB factor is insignificant in the China and Hong Kong stock markets under both the noise-augmented asset pricing models.

In Taiwan, the domestic HML factor of the international and domestic models is significant under both the noise-augmented asset pricing models. However, the foreign HML factor of the international model is significant at 5% level under the noise augmented asset pricing model based on Fama and French Five Factor Model. On the other hand, the foreign HML factor of the international model in Hong Kong is significant at 5% level under the noise augmented asset pricing model based on Fama and French Five Factor Model. However, the HML factor is insignificant in the China stock markets under both the noise-augmented asset pricing models.

The profitability factor (RMW) of the Hong Kong stock market is significant under the world and domestic models at 5% and 10% levels. In addition, the domestic profitability factor (DRMW) of the international model in the Hong Kong stock market is significant at 1 % level. As for the Taiwan stock market, the profitability factor (RMW) is significant at 10% under the world model. Also, the foreign profitability factor (FRMW) of the international model of the Taiwan stock market is significant at 5 % level. However, the profitability factor is insignificant statistically in the China stock market during the Euro Zone Crisis.

The foreign investment factor (FCMA) of the international model of the Hong Kong stock market is significant at 1% level. In the Taiwan stock market, the investment factor (CMA) is significant at 5% level under the world model. Also, the domestic investment factor (DCMA) of the international model of the Taiwan stock market is significant at 5% level.

In the China stock market, the foreign INVSENT factor of the international model is significant at 10% under the noise augmented asset pricing model based on Fama and French Three Factor Model. In the Hong Kong stock market, the INVSENT factor of the world model is significant at 1% level under both the noise augmented asset pricing models. In addition, the domestic INVSENT factor of the international and domestic models is also significant under both the noise augmented asset pricing models. In the Taiwan stock market, the foreign INVSENT factor of the international model is significant at 1% level under both the noise augmented asset pricing models

Lastly, the adjusted R-squared values of the three stock markets are generally higher in the noise augmented asset pricing model based on Fama and French Five Factor Model than noise augmented asset pricing model based on Fama and French Three Factor Model .

6.6.5 Comparison with literature

The main contribution of this research is the construction of noised-augmented asset pricing models, built upon the works of Fama and French in the Three Factor Model (1992, 1993) and Five Factor Model (2014). To the author's knowledge, this is one of the first attempt to quantitatively reconcile risk based models and behavioral school thought by developing parsimonious capital asset pricing models, in explaining the value premium phenomenon. On the background of the controversy between risk-based theory and behavioral model, the Adaptive Market Hypothesis has been presented (Lo, 2004, 2005) with a new paradigm where a framework that reconciles market efficiency with behavioral alternatives is established by applying the principles of evolution. Along the same line of thought, Lo (2011) has further researched qualitatively into the study of fear, greed and financial crises from a cognitive neurosciences perspective.

On the other hand, Calomiris et al. (2010) have studied the relationship between the crisis "shock factors" and the cross-section of global equity returns. The authors identify three crisis "shock factors" related to unique features of the crisis: (1) the collapse of global demand, (2) the contraction of credit supply, and (3) selling pressure on firms' equity. There are three main distinctions between this research and their works. Firstly, this research places a strong focus on behavioral finance. Secondly, the scope involved – while the research is investigating the Great China stock markets, the work of Calomiris et al. (2010) has studied to stock markets of 45 countries. Thirdly, while this research is adopting a two period framework – Global Financial Crisis and Euro Zone Crisis, the window of investigation on the crisis "shock factors" is Global Financial Crisis.

The main conclusion of this research is that the investment sentiment (INVSENT) factor is a statistically significant determinant of the stock returns in the Hong Kong stock markets during the Euro Zone Crisis. The investment sentiment (INVSENT) factor is only weakly significant or insignificant statistically in the China and Taiwan stock markets during these two financial crises. The Hong Kong stock market is characterized by a large proportion of institutional investors. It is argued that this finding is consistent with the theoretical works of Mendel & Shleifer (2012) and Arnott et al. (2007). In their model, Mendel & Shleifer (2012) have illustrated that the rational but uninformed traders occasionally chase noise as if it were information. As a result the sentiments shocked are amplified and prices are moved away from the fundamental values. It is argued that noise traders can have an effect on the market equilibrium disproportionately, relative to their size in the market. Furthermore, Arnott et al. (2007) have examined the relationship of noise with size and value effects by the construction of a parsimonious model. Based on the argument that noise is a temporary deviation of stock prices from their fundamental, the authors have suggested that the growth-value cycle is essentially the result of the noise variance on its expansion and contraction and hence, size and value effects are manifested.

6.7 Chapter Summary and Conclusions

"…..we often find ourselves switching to a slower, more deliberate and effortful of thinking. This is the slow thinking. Fast thinking includes both variants of intuitive thoughts – the expert and the heuristic – as well as the entirely automatic mental activities of perception and memory ……."

Daniel Kahneman

The empirical analysis 2 in Chapter 5 has concluded that by considering the values of the adjusted R-squared and varying signals of the risk measures, it is suggested that risk factors of the three asset pricing models do not fully explain the value premium phenomenon in the Greater China stock markets during the two major financial crises. With the recent development in the areas of noise, investor sentiment and volatility of the finance and accounting literatures, this research attempts to develop a noise-augmented asset pricing model in Empirical Analysis 3. Building upon the foundation of Fama and French Three Factor Model and Fama and French Five Factor Model, the noise-augmented asset pricing model reconciles risk based theory and behavioural finance quantitatively.

Based on the empirical results, analysis and discussions, the research has arrived at a number of main conclusions when addressing the research objective - "To examine do and to what extent the investor sentiment measure and risk measures of (i) Fama and French Three Factor Model (1992, 1993) and (ii) Fama and French Five Factor Model (2014) explain the value premium in the Greater China stock markets during the Global Financial Crisis and Euro Zone Crisis."

Firstly, the investor sentiment (INVSENT) factor is a statistically significant determinant of the stock returns in the Hong Kong stock markets during the Euro Zone Crisis. The investor sentiment (INVSENT) factor is only weakly significant or insignificant statistically in the China and Taiwan stock markets during these two financial crises.

Secondly, consistent with the study under the Fama and French Three Factor Model (1992, 1993), the research has shown that the three risk measures - market risk premium (MRP), SMB factor and HML factor are classified as semi-strong signals in explaining value premium in the Greater China stock markets during the two major financial crises.

Thirdly, the investigation under the Fama and French Five Factor Model (2014) has shed light that the five risk measures - market risk premium (MRP) factor, SMB factor, HML factor, profitability factor (RMW) and investment factor (CMA) are semi-strong signals in explaining value premium in the Greater China stock markets during the two major financial crises.

Fourthly, the adjusted R-squared values for the Noise-augmented asset pricing model which is based on Fama and French Five Factor Model is higher than those of the Noise-augmented asset pricing model which is based on Fama and French Three Factor Model.

Fifthly, in general, the values of the adjusted R-squared in the China and Taiwan stock markets are higher during the Euro Zone Crisis than those of Global Financial Crisis. However, to a large extent, the adjusted R-squared values in the Hong Kong stock market are higher during the Global Financial Crisis and those of Euro Zone Crisis. This observation may be due to high proportions of institutional investors in participating in the Hong Kong stock market. The institutional investors, or is called the 'smart money', are more rational and less affected by emotions, in their decision makings.

Lastly, considering the of adjusted R-squared and varying signals of the factors, it is suggested that there are other sources of systematic noise that may influence the stock returns in the Great China stock markets during the two major financial crises.

CHAPTER 7: CONCLUSION

"If we become increasingly humble about how little we know, we may be more eager to search." *Sir John Templeton*

This concluding chapter reexamines the three main research questions and argument of the thesis. The chapter explains how the argument has been developed throughout the thesis. It includes an analysis of the development of the theoretical framework as set out in Chapter 3 and how the theoretical framework has been supported by empirical evidence. The conclusions then move on to outline the potential practical implications of the study. Lastly, it discusses the limitations of this study and directions for future research.

7.1 Summary and conclusions

The theory of efficient capital market, one of the important pillars in the modern theory of finance, is being challenged by new studies of security prices in the recent years. These researches have reversed some of the evidences favoring market efficiency, giving birth to the rise of behavioral finance as an alternative school of thought. The issue of market inefficiency is even more pertinent, particularly during financial crises when financial markets are experiencing high degree of volatility, with larger magnitude of mispricing - the deviation of the market price from the fundamental value, than usual, in the short to medium term horizon.

Little research has been carried out on the phenomenon of value premium over a short horizon during a period of high volatility. The study on the cross-section of equity returns is a major topic in asset pricing, where empirical works expanding from the developed markets to the more recent of emerging markets have provided evidences that equity returns are predictable, to some extent, especially in the long run. However, little is known about the discovery of the performance or resilience of value stocks and growth stocks during the period of a global financial crisis, when the market is inefficient, given the occurrence of a financial crisis is a rare event. By studying the behaviour of stock prices and examining the underlying theoretical reasonings in the context of Great China stock markets during the Global Financial Crisis and Euro Zone Crisis, the thesis fills a research gap.

Against this background, the first research question of the thesis asks "is there value premium in the Greater China stock markets during the Global Financial Crisis and Euro Zone Crisis?" More specifically, the research question has two objectives. Firstly, to assess the impact of Global Financial Crisis and Euro Zone Crisis on the performance of value stocks and growth stocks in the China, Hong Kong and Taiwan stock markets, taking into consideration overall firm, and market capitalisation issues. The empirical results show that growth stocks outperformed value stocks during both the Global Financial Crisis and Euro Zone Crisis in the China and Hong Kong stock markets, contrary to the understanding that value premium exists in the long run. However, value stocks outperformed the growth stocks in the Taiwan stock market during the Global Financial Crisis and Euro Zone Crisis. Furthermore, the small size effect did not really diminish in the Greater China stock markets during two major financial crises. It is discovered that small stocks outperformed big stocks during the Global Financial Crisis and Euro Zone Crisis for the three stock markets in the Greater China region. In addition, it is found that the returns of small and big stocks during Global Financial Crisis are higher than those of small and big stocks during Euro Zone Crisis

The second research objective is to examine does the standard risk measures explain the risk and return relationship of these two stock selection strategies, at overall firm and market capitalisation levels, during the Global Financial Crisis and Euro Zone Crisis. , it is discovered that the standard deviation and Sharpe ratio are unstable in the China, Hong Kong and Taiwan stock markets during the Global Financial Crisis. Comparatively, lower degree of unstablility is observed on the behavior of the two risk measures during Euro Zone Crisis. With the preliminary evidence, it is argued that therefore, standard risk measures do not fully explain the risk and return relationship of these two stock selection strategies. Drawing upon Kuhn's argument on the stages of scientific revolutions, the aim at this stage is to surface the anomalies and account the outliers, in order to improve the theory.

In line with the next stage of Kuhn's scientific revolutions, the subsequent aim of the research is to examine whether the older methods and approaches are able to explain or solve the anomaly. With the risk based theories as the reigning paradigm, the second research question investigates "do the risk factors explain value premium in the Greater China stock markets during two major financial crises?" The main risk based models that explain value premium phenomenon in the finance literature are Banko, Conover and Jensen Model (2006), Fama and French Three Factor Model (1992, 1993) and Fama and French Five Factor Model (2014).The study of cross section of expected stock returns by using the Fama and French Three Factor Model and the subsequent extended model (Fama & French, 1992 & 2014) have been at the overall firm and market capitalisation classifications. Furthermore, Griffin (2002) has examined whether the Fama and French Factors are global or country specific from the market integration perspective. At the industry level, Banco et al. (2006) study the relationship between the value effect and industry affiliation. The risk measures of Banko et al. (2006) are BE/ME (book-to-market ratio), Industry BE /ME (Industry book-to-market ratio), ME (market capitalilsation) and Beta. Hence, the research objective is to examine do and to what extent the risk measures of (i) Banko, Conover and Jensen Model (2006), (ii) Fama and French Three Factor Model (1992, 1993) and (iii) Fama and French Five Factor Model (2014) explain the value premium in the Greater China stock markets during the Global Financial Crisis and Euro Zone Crisis.

The findings reveal that under the Banko, Conover and Jensen Model (2006), mixed results are observed. During the Global Financial Crisis, industry book-to-market ratio is a strong signal in the China and Hong Kong stock markets. In addition, the portfolio book-to-market ratio at the firm level is significant at 1 % level in the Hong Kong and Taiwan stock markets. Further analysis at the industrial level has revealed that industry book-to-market ratio is a more prominent factor than the portfolio book-to-market ratio at the firm level in all the three stock markets of the Greater China region during the Global Financial Crisis. Market capitalisation is significant in both the China and Hong Kong stock markets, whereas, the beta is only significant in the China stock market. During the Euro Zone Crisis, the firm level book-to-market ratio is significant the Hong Kong stock markets, even after controlling for market capitalisation and beta. However, the industry book-to-market is insignificant statistically in the three stock markets of the Greater China region. Secondly, the study under the Fama and French Three Factor Model (1992, 1993) has shown that the three risk measures - market risk premium (MRP) factor, SMB factor and HML factor are semi-strong signals in explaining value premium in the Greater China stock markets during the two major financial crises. Furthermore, the investigation under the Fama and French Five Factor Model (2015) has shed light that the five risk measures - market risk premium (MRP) factor, SMB factor, HML factor, profitability factor (RMW) and investment factor (CMA) are semi-strong signals. The adjusted R-squared values for the Fama and French Five Factor Model are higher than those of the Fama and French Three Factor Model. Considering the values of the adjusted R-squared and varying signals of the risk measures, it is suggested that risk factors of the three asset pricing models do not fully explain the value premium phenomenon in the Greater China stock markets during the two major financial crises.

Kuhn further elaborates that the anomaly opens up a “crisis” period during which, new methods and approaches are permitted, as the older ones have proved incapable to explain or solve the anomaly. In the hope of cracking the anomaly, previous heretical views and procedures are temporarily allowed. Based on this argument, the rare occurrence of the Global Finance Crisis and Euro Zone Crisis has provided an appropriate and suitable context to reconcile volatility, as a proxy of the noise traders’ risk in the financial market (De Long et al, 1990), with investor sentiments (Barberis et. al, 1998; Sheleifer, 2000; Baker and Wurgler, 2007) representing the behavior of investors. Thus, the third research question probes “do investor sentiment and risk measures explain value premium in the Greater China stock markets during two major financial crises?" By constructing of noise augmented asset pricing models through examining the Greater China stock markets during two major financial crises, this research has contributed in filling a research gap. To the author's knowledge, this is one of the first attempts to quantitatively reconcile risk based models and behavioral school thought by developing parsimonious capital asset pricing models, in explaining the value premium phenomenon. Against this background, the research objective is to examine do and to what extent the investor sentiment measure and risk measures of (i) Fama and French Three Factor Model (1992, 1993) and (ii) Fama and French Five Factor Model (2014) explain the value premium in the Greater China stock markets during the Global Financial Crisis and Euro Zone Crisis. The empirical evidence shed light that the investor sentiment (INVSENT) factor is a statistically significant determinant of the stock returns in the Hong Kong stock markets during the Euro Zone Crisis. The investor sentiment (INVSENT) factor is only weakly significant or insignificant statistically in the China and Taiwan stock markets during these two financial crises. Secondly, consistent with the study under the Fama and French Three Factor Model (1992, 1993), the research has shown that the three risk measures - market risk premium (MRP), SMB factor and HML factor are classified as semi-strong signals in explaining value premium in the Greater China stock markets during the two major financial crises. Besides, the investigation under the Fama and French Five Factor Model (2014) has also shed light that the five risk measures - market risk premium (MRP) factor, SMB factor, HML factor, profitability factor (RMW) and investment factor (CMA) are semi-strong signals. The adjusted R-squared values for the Noise-augmented asset pricing model which is based on Fama and French Five Factor Model is higher than those of the Noise-augmented asset pricing model which is based on Fama and French Three Factor Model.mIn general, the values of the adjusted R-squared in the China and Taiwan stock markets are higher during the Euro Zone Crisis than those of Global Financial Crisis. However, to a large extent, the adjusted R-squared values in the Hong Kong stock market are higher during the Global Financial Crisis and those of Euro Zone Crisis. This observation may be due to high proportions of institutional investors in participating in the Hong Kong stock market. The institutional investors, or is called the 'smart money', are more rational and less affected by emotions, in their decision makings. Lastly, considering the of adjusted R-squared and varying signals of the factors, it is suggested that there are other sources of systematic noise that may influence the stock returns in the Great China stock markets during the two major financial crises. It is envisaged that the development of the noise-augmented asset pricing model would contribute towards the 'paradigm shift' of reconciling risk based theory and behavioral finance, especially after Eugene F. Fama**,** Lars Peter Hansen and Robert J. Shiller were awarded The Sveriges Riksbank Prize in

Economic Sciences in Memory of Alfred Nobel in 2013 for their contributions on empirical analysis of asset prices.

7.2 Practical implications

In addition to contributing to the advancement of knowledge in the academic world, the empirical evidences of the thesis have practical implications.

Firstly, the findings of this research are expected to provide a fresh insight to the investment managers in the asset allocation and portfolio management decision, for both static buy and-hold and dynamic optimal rebalancing approaches, when the high volatility of the market has a significant impact on the portfolio return. In time of financial crises, the choice between fixed income securities and equities is important, or even critical to ensure a healthy margin of safety in the financial assets portfolio. It is evident from the empirical results that the market risk premium (MRP) is a statistically significant factor, especially in the Taiwan and China stock markets at the overall firm level. It is, therefore, of importance that the investor and traders alike should consider having a higher proportion of fixed income securities in the asset allocation and portfolio management decision during period of financial crises.

Secondly, the empirical results have shown that the SMB factor is significant, especially in the small market capitalisation portfolios during the Global Financial Crisis and Euro Zone Crisis. In this context, Berk (1995) argued that "size-related regularities in asset prices should not be regarded as anomalies". Instead, the author shows theoretically that the logarithm of market value will be inversely related to expected return, even in an economy in which firm size and risk are unrelated. As a result, market value and expected returns will be negatively correlated in the cross-section. Furthermore, it is demonstrated that if either the asset pricing model is misspecified-or the empirical specification is incorrect, so long as this misspecification does not imply a positive relation between operating size and the return predicted by the model, the logarithm of market value will be inversely correlated with the part of return not explained by the model. Besides, the recent empirical work of Asness et al. (2014) has argued that quality factor is essential to resurrect the otherwise size effect, which is in decline and waning. Quality security is defined as "the one that has characteristics that, all else being equal, an investor should be willing to pay a higher price for: stock which are safe, profitable, growing and well managed". Based on a 'quality minus junk' factor, the SMB factor is highly negatively correlated to the quality factor, as small firms are junky and big firms are high quality, on average. From the perspective of the risk based model, the practical implication of examining the SMB factor during the period of financial crises is that investors should increase the holding of not only small firm stocks, but small firm stocks which is of high quality.

Thirdly, the empirical results show that growth stocks outperformed value stocks during both the Global Financial Crisis and Euro Zone Crisis in the China and Hong Kong stock markets, contrary to the theoretical understanding that value premium exists in the long run. This work complements similar finding of Lee, Strong and Zhu (2014) in the U.S. market. However, value stocks outperformed the growth stocks in the Taiwan stock market during the Global Financial Crisis and Euro Zone Crisis. Interestingly, however, Fama and French (2015) have argued that in the Five-Factor Model, HML factor is redundant for describing average returns based on the U.S. data used for 1963–2013. This empirical evidence has yielded mixed results on the performance of value stock versus growth stocks in the three stock markets of the Greater China region during the period of two financial. The implication is that when investing for the short term during the period of financial crises, consideration ought to be given to characteristics of the stock market concerned. Nevertheless, it is a recommended strategy to invest in value stocks for the long run during the period of financial crises, given the strength of the empirical evidence (see for example Fama and French,1988, 1992, 1993; Davis et.al., 2000; Claessens et al., 1998; Shum and Tang, 2005; Asness et al., 2009; Cakici et al., 2011).

Fourthly, the empirical evidences at the overall firm level in the three stock markets of the Greater China region during the two financial crises reveal that the profitability factor (RMW) and investment factor (CMA) are statistically weakly significant. However, further analysis at the market capitalisation and integration levels has shown that these two factors are marginally significant. The inclusion of profitability factor and investment factor by Fama and French (2015) has extended the Three Factor Model to Five Factor Model. Nichol et. al (2014) has argued that in the UK setting, the profitability factor shows more promise than the investment factor in the explanatory power of the asset pricing model. Arguably, the practical implication is that when investing during the financial crises and in order to obtain a satisfactory average stock returns, the investors ought to take into account historical and future profitability of the firms, in addition to and to a certain extent, the past and future investment plan of the firms involved.

The thesis argued that this is one of the first attempts to quantitatively reconcile risk based theory and behavioral finance by developing parsimonious asset pricing models for explaining value premium phenomenon, especially in the context of financial crises. The Fama and French Five Factor Model represents the risk based model, whilst the inclusion of the investor sentiment (INVSENT) factor is a proxy of noise in behavioural finance. The empirical result of this research has provided insight that the investment sentiment (INVSENT) factor is a statistically significant determinant of the stock returns in the Hong Kong stock markets during the Euro Zone Crisis. One of the possible theoretical explanations is that the traders are uncertain whether other market participants are trading on informative signals or noise (Banerjee and Green, 2015). In addition, it is argued that investor sentiment – both global and local are contrarian predictors of the time series of major markets' returns (Baker et. al, 2014). The practical implication is that when investing during the period of financial crises, one has to firstly, be selectively in stocks and hence businesses involved, relying on the principles embodied in the risk based model – Fama and French Five Factor Model. Then, be aware of the mispricing - deviation of the market price from the intrinsic value caused by the investor sentiment. The mispricing may present opportunities for contrarian investment strategy. It is evident from this thesis that investor sentiment is a significant factor in the average stock returns of a mature and developed capital market – Hong Kong stock exchange.

7.3 Limitations and direction for future research

One of the main theoretical foundations of this thesis is based on the argument of using context as a vehicle for theory development (John,2006). The work of Muir (2014) has performed in depth studies on the behavior of risk premia in financial crises, wars, and recessions over 140 years and 14 countries, yielding 45 financial crises. In conducting further research, the issue at hand is to consider adopting an approach similar to that of Muir (2014). The examination on the relevance of the augmented-noise asset pricing models during financial crisis could be conducted more comprehensively over majority of the stock markets and financial crisis, so as to ensure robustness of the results.

Secondly, it is argued in the thesis that investor sentiment is systematic and is a good proxy of noise in behavioural finance (Barbel et al., 2009). Therefore, the investor sentiment is used for the construction of noise–augmented asset pricing models. The measure of investor sentiment (INVSENT) is adapted based on the trading volume trend (Baker and Stein,2004) and justified by the work of Lee and Swaminathan (2000). However, Baker and Wurgler (2007) have also proposed other sentiment proxies, among others are investor survey, investor mood, retail investor trades, mutual fund flows, dividend premium, closed-end fund discount, option implied volatility, IPO first return returns, IPO volume, equity issues over new issues and insider trading. They further advocate for the construction of a sentiment index. With this development, the use of trading volume trend, instead of a sentiment index, may constitute a limitation in the thesis. In addressing this issue, the use of an investor sentiment index, where there is availability of data, ought to be considered in the construction of noise augmented asset pricing model. The next question to ask is whether the augmented-noise asset pricing models is still valid, when we look at the issue from a long term horizon perspective? In addition, an important research area to explore is to know, understanding and validate different sources of systematic noise.

On the data and sample selection issue, this research is conducted by using data which are collected from sources other than the same data as previous studies, especially Fama and French's works. In order to provide an insight on whether the new variable – INVSENT factor yield different results and impacts on returns, future research should consider applying the methods used in the previous literature to their data or using same data as previous studies, especially comparison with the Fama and French (1992, 1993 and 2015).

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Table 11 Regression Results of Monthly Portfolio Returns on Portfolio BE/ME, Industry BE/ME, and Control Variables
OLS Firm Specific and Time Effects

Model	BE /ME	Industry BE /ME	ME	Beta	Adjusted R- Squared
1	0.0031				0.68
	(1.09)				
2		-0.0099 ***			0.69
		(-2.78)			
3	0.0043	-0.0121 ***			0.69
	(1.46)	(-2.91)			
4	0.0045	-0.0098 **	-0.0020 **		0.69
	(1.51)	(-2.57)	(-2.44)		
5	0.0048 *	-0.0115 ***	-0.0023 ***	0.0108 **	0.69
	(1.66)	(-2.88)	(-2.82)	(1.82)	

Results of Panel Data Analysis - Model 1

	Dependent Variable						Yes	
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects		OLS Firm Specific & Time Effects	
Intercept	0.0550	***	0.0550	***	0.0550	***	-0.0556	***
	(10.36)		(8.64)		(2.69)		(-7.58)	
BE/ME	0.02652	***	0.02652	***	0.0265	***	0.0031	
	(7.32)		(6.34)		(2.92)		(1.09)	
Breusch-Pagan LM test								
Hausman test								
Observations	3,230		3,230		3,230		3,230	
Multicollinearity (vif)								
Heteroskedasticity								
Serial Correlation (F- stat)								
R-Squared	0.0163		0.0163		0.0163		0.6850	
Adjusted R-Squared	0.0160		0.0160		0.0160		0.6849	

Test for the presence of fixed firm effect		
Fixed Effect Model - F test (p-value)	0.0000	
Test for the presence of time effect		
Time Dummies - F test (p-value)	0.0000	

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where

R^2 = sample R-square

p = Number of predictors

N = Total sample size.

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1-R2	0.315000
N-1	3,229
N-p-1	3,228
	0.32

Results of Panel Data Analysis - Model 2

	Dependent Variables			Yes
	Pooled OLS	OLS Firm Specific Effects	OLS Time Effects	OLS Firm Specific & Time Effects
Intercept	0.1189 ***	0.1189 ***	0.1189 ***	-0.0734 ***
	(12.82)	(6.60)	(2.97)	(-10.23)
Industry BE /ME	0.0812 ***	0.0812 ***	0.0812 ***	-0.0099 ***
	(10.99)	(5.97)	(2.68)	(-2.78)
Breusch-Pagan LM test				
Hausman test				
Observations	3,230	3,230	3,230	3,230
Multicollinearity (vif)				
Heteroskedasticity				
Serial Correlation (F- stat)				
R-Squared	0.0361	0.0361	0.0361	0.6851
Adjusted R-Squared	0.0358	0.0358	0.0358	0.6850

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.0000
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.31
N-1	3,229
N-p-1	3,228
	0.31

Results of Panel Data Analysis - Model 3

	Dependent Variables Pooled OLS	OLS Firm Specific Effects	OLS Time Effects	Yes OLS Firm Specific & Time Effects
Intercept	0.1253 *** (13.32)	0.1252 *** (7.31)	0.1252 *** (3.06)	-0.0702 *** (-8.37)
BE/ME	0.0146 *** (3.83)	0.0146 *** (2.84)	0.0146 *** (2.62)	0.0043 (1.46)
Industry BE /ME	0.0707 *** (9.00)	0.0707 *** (5.07)	0.0707 ** (2.54)	-0.0121 *** (-2.91)
Breusch-Pagan LM test				
Hausman test				
Observations	3,230	3,230	3,230	3,230
Multicollinearity (vif)				
Heteroskedasticity				
Serial Correlation (F- stat)				
R-Squared	0.0404	0.0404	0.0404	0.6855
Adjusted R-Squared	0.0398	0.0398	0.0398	0.69

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.0000
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.

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1-R2	0.31
N-1	3,229
N-p-1	3,227
	0.31

Results of Panel Data Analysis - Model 4

	Dependent Variables Pooled OLS		OLS Firm Specific Effects		OLS Time Effects		Yes OLS Firm Specific & Time Effects	
Intercept	0.2167	***	0.2167	***	0.2167	***	-0.0267	
	(6.65)		(4.90)		(3.65)		(-1.33)	
BE/ME	0.0149	***	0.0149	***	0.0149	***	0.0045	
	(3.90)		(2.82)		(2.71)		(1.51)	
Industry BE /ME	0.0735	***	0.0735	***	0.0735	***	-0.0098	**
	(9.29)		(5.15)		(2.61)		(-2.57)	
ME	-0.0042	***	-0.0042	**	-0.0042	***	-0.0020	**
	(-2.93)		(-2.28)		(-2.64)		(-2.44)	
Breusch-Pagan LM test								
Hausman test								
Observations	3,230		3,230		3,230		3,230	
Multicollinearity (vif)								
Heteroskedasticity								
Serial Correlation (F- stat)								
R-Squared	0.0430		0.0430		0.0430		0.6860	
Adjused R-Squared	0.0421		0.0421		0.0421		0.6857	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.0000
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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0.957000	1-R2	0.31
3,229	N-1	3,229
3,226	N-p-1	3,226
0.95789		0.31

Results of Panel Data Analysis - Model 5

	Dependent Variables						Yes	
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects		OLS Firm Specific & Time Effects	
Intercept	0.219	***	0.2219	***	0.2219	***	-0.0347	*
	(6.73)		(4.99)		(3.73)		(-1.88)	
BE/ME	0.0142	***	0.0142	***	0.0142	***	0.0048	*
	(3.73)		(2.55)		(2.69)		(1.66)	
Industry BE /ME	0.0731	***	0.0731	***	0.0731	***	-0.0115	***
	(9.25)		(5.11)		(2.63)		(-2.88)	
ME	-0.0039	***	-0.0039	***	-0.0039	**	-0.0023	***
	(-2.71)		(-2.04)		(-2.34)		(-2.82)	
Beta	-0.0109	***	-0.0109		-0.0109		0.0108	*
	(-3.14)		(-1.11)		(-0.95)		(1.82)	
Breusch-Pagan LM test								
Hausman test								
Observations	3,230		3,230		3,230		3,230	
Multicollinearity (vif)								
Heteroskedasticity								
Serial Correlation (F- stat)								
R-Squared	0.0459		0.0459		0.0459		0.6886	
Adjused R-Squared	0.0447		0.0447		0.0447		0.69	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.0000
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.3114
N-1	3,229
N-p-1	3,225

0.311786

Table 11 Regression Results of Monthly Portfolio Returns on Portfolio BE/ME, Industry BE/ME, and Control Variables
OLS Firm Specific and Time Effects

Model	BE /ME		Industry BE /ME		ME		Beta	Adjusted R- Squared
1	-0.0154	***						0.3631
	(-3.26)							
2			-0.0084					0.3593
			(-0.71)					
3	-0.0163	***	0.0080					0.3639
	(-3.13)		(0.63)					
4	-0.0291	***	0.1070	***	-0.0134	***		0.3657
	(-5.02)		(3.01)		(-3.49)			
5	-0.0291	***	0.1087	***	-0.0149	***	0.0024	0.3609
	(-4.91)		(3.03)		(-3.75)		(0.12)	

Results of Panel Data Analysis - Model 1

				Yes
	Dependent Variable			
	Pooled OLS	OLS Firm Specific Effects	OLS Time Effects	OLS Firm Specific & Time Effects
Intercept	0.0389 ***	0.0389 ***	0.0389 *	-0.1525 ***
	(9.44)	(9.65)	(1.86)	(-13.18)
BE/ME	0.0012	0.0012	0.0012	-0.0154 ***
	(0.28)	(0.25)	(0.18)	(-3.26)
Breusch-Pagan LM test				
Hausman test				
Observations	2,520	2,520	2,520	2,520
Multicollinearity (vif)				
Heteroskedasticity				
Serial Correlation (F- stat)				
R Squared	0.0000	0.0000	0.0000	0.3634
Adjusted R Squared	-0.0004	-0.0004	-0.0004	0.3631
Test for the presence of fixed firm effect				
Fixed Effect Model - F test (p-value)	0.0000			
Test for the presence of time effect				
Time Dummies - F test (p-value)	0.0000			

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where

R^2 = sample R-square

p = Number of predictors

N = Total sample size.

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1-R2	0.6366
N-1	2,519
N-p-1	2,518
	0.636853

Results of Panel Data Analysis - Model 2

				Yes
	Dependent Variables			
	Pooled OLS	OLS Firm Specific Effects	OLS Time Effects	OLS Firm Specific & Time Effects
Intercept	0.0175 ***	0.0175 ***	0.0175	-0.1476 ***
	(3.67)	(2.91)	(0.83)	(-12.09)
Industry BE /ME	0.0834 ***	0.0834 ***	0.0834 **	-0.0084
	(8.41)	(6.42)	(2.47)	(-0.71)
Breusch-Pagan LM test				
Hausman test				
Observations	2,520	2,520	2,520	2,520
Multicollinearity (vif)				
Heteroskedasticity				
Serial Correlation (F- stat)				
R Squared	0.0273	0.0273	0.0273	0.3596
Adjusted R Squared	0.0270	0.0270	0.0270	0.3593

Test for the presence of fixed firm effect Fixed Effect Model - F test (p-value)	0.0000
Test for the presence of time effect Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.6404
N-1	2,519
N-p-1	2,518
	0.6407

Results of Panel Data Analysis - Model 3

							Yes	
	Dependent Variables							
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects		OLS Firm Specific & Time Effects	
Intercept	0.0121	***	0.0121	**	0.0121	**	-0.1531	***
	(2.42)		(2.05)		(2.05)		(-13.09)	
BE/ME	-0.0165	***	-0.0165	***	-0.0165	***	-0.0163	***
	(-3.57)		(-2.58)		(-2.58)		(-3.13)	
Industry BE /ME	0.0996	***	0.0996	***	0.0996	***	0.0080	
	(9.16)		(6.60)		(6.60)		(0.63)	
Breusch-Pagan LM test								
Hausman test								
Observations	2,520		2,520		2,520		2,520	
Multicollinearity (vif)								
Heteroskedasticity								
Serial Correlation (F- stat)								
R Squared	0.03230		0.03230		0.03230		0.3644	
Adjusted R Squared	0.0315		0.0315		0.0315		0.3639	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.0000
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.6356
N-1	2,519
N-p-1	2,517
	0.6361

Results of Panel Data Analysis - Model 4

	Dependent Variables						Yes	
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects		OLS Firm Specific & Time Effects	
Intercept	0.2792	***	0.2792	***	0.2792	***	-0.0197	
	(5.12)		(4.16)		(3.63)		(-0.37)	
BE/ME	-0.0291	***	-0.0291	***	-0.0291	***	-0.0226	***
	(-5.54)		(-3.88)		(-5.02)		(-3.55)	
Industry BE /ME	0.1070	***	0.1070	***	0.1070	***	0.0184	
	(9.78)		(7.57)		(3.01)		(1.36)	
ME	-0.0134	***	-0.0134	***	-0.0134	***	-0.0066	***
	(-4.92)		(-4.07)		(-3.49)		(-2.62)	
Breusch-Pagan LM test								
Hausman test								
Observations	2,520		2,520		2,520		2,520	
Multicollinearity (vif)								
Heteroskedasticity								
Serial Correlation (F- stat)								
R Squared	0.0415		0.0415		0.0415		0.3665	
Adjusted R Squared	0.0403		0.0403		0.0403		0.3657	
Test for the presence of fixed firm effect								
Fixed Effect Model - F test (p-value)	0.0000							
Test for the presence of time effect								
Time Dummies - F test (p-value)	0.0000							

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where

R^2 = sample R-square

p = Number of predictors

N = Total sample size.

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1-R2	0.6335
N-1	2,519
N-p-1	2,516
	0.6343

Results of Panel Data Analysis - Model 5

							Yes
	Dependent Variables						
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects		OLS Firm Specific & Time Effects
Intercept	0.3126	***	0.3126	***	0.3126	***	-0.0107
	(5.65)		(4.78)		(3.91)		(0.19)
BE/ME	-0.0291	***	-0.0291	***	-0.0291	***	-0.0236
	(-5.44)		(-3.90)		(-4.91)		(-3.73)
Industry BE /ME	0.1087	***	0.1087	***	0.1087	***	0.0191
	(9.91)		(7.83)		(3.03)		(1.45)
ME	-0.0149	***	-0.0149	***	-0.0149	***	-0.0073
	(-5.36)		(-4.62)		(-3.75)		(-2.86)
Beta	0.0024		0.0024		0.0024		-0.0065
	(0.37)		(0.13)		(0.12)		(-0.38)
Breusch-Pagan LM test							
Hausman test							
Observations	2,472		2,472		2,472		2,472
Multicollinearity (vif)							
Heteroskedasticity							
Serial Correlation (F- stat)							
R Squared	0.0447		0.0447		0.0447		0.3619
Adjusted R Squared	0.0431		0.0431		0.0431		0.3609

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.0000
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.6381
N-1	2,471
N-p-1	2,467
	0.6391

Lim, Chee Ming (2017) Noise-augmented asset pricing models:Evidence from the Greater China stock markets during two major financial crises. PhD thesis, University of Nottingham.

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Table 11 Regression Results of Monthly Portfolio Returns on Portfolio BE/ME, Industry BE/ME, and Control Variables
OLS Firm Specific and Time Effects

Model	BE /ME		Industry BE /ME	ME	Beta	Adjusted R- Squared
1	0.01	***				0.75
	(4.18)					
2			0.0101			0.75
			(1.19)			
3	0.0116	***	-0.0024			0.75
	(4.23)		(-0.36)			
4	0.01	***	-0.0026	-0.0001		0.75
	(4.03)		(-0.40)	(-0.31)		
5	0.0113	***	0.0007	-0.0001	0.0082	0.75
	(3.54)		(0.08)	(-0.24)	(1.11)	

Results of Panel Data Analysis - Model 1

					Yes
	Dependent Variable				
	Pooled OLS	OLS with robust cluster standard errors	OLS Firm Specific Effects	OLS Time Effects	OLS Firm Specific & Time Effects
Intercept	0.0345 ***	0.0345 ***	0.0345 ***	0.0345 ***	-0.0755 ***
	(11.82)	(14.93)	(14.93)	(14.93)	(-6.06)
BE/ME	0.0436 ***	0.0436 ***	0.0436 ***	0.0436 ***	0.0114 ***
	(9.68)	(8.45)	(8.45)	(8.45)	(4.18)
Breusch-Pagan LM test					
Hausman test					
Observations	1,980	1,980	1,980	1,980	1,980
Multicollinearity (vif)					
Heteroskedasticity					
Serial Correlation (F- stat)					
R-Squared	0.0452	0.0452	0.0452	0.0452	0.7512
Adjusted R-Squared	0.0447	0.0447	0.0447	0.0447	0.751074

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.0000

Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where

R^2 = sample R-square

p = Number of predictors

N = Total sample size.

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1-R2	0.2488
N-1	1,979
N-p-1	1,978
	0.248926

Results of Panel Data Analysis - Model 2

	Dependent Variables				Yes
	Pooled OLS	OLS with robust cluster standard errors	OLS Firm Specific Effects	OLS Time Effects	OLS Firm Specific & Time Effects
Intercept	0.0378 ***	0.0378 ***	0.0378 ***	0.0378 ***	-0.0773 ***
	(13.54)	(11.58)	(11.58)	(2.18)	(-6.32)
Industry BE /ME	0.1255 ***	0.1255 ***	0.1255 ***	0.1255 ***	0.0101
	(15.14)	(18.28)	(18.28)	(2.73)	(1.19)
Breusch-Pagan LM test					
Hausman test					
Observations	1,980	1,980	1,980	1,980	1,980
Multicollinearity (vif)					
Heteroskedasticity					
Serial Correlation (F- stat)					
R-Squared	0.1039	0.1039	0.1039	0.1039	0.7489
Adjusted R-Squared	0.1034	0.1034	0.1034	0.1034	0.75

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.0222

Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.2511
N-1	1,979
N-p-1	1,978
	0.251227

Results of Panel Data Analysis - Model 3

	Dependent Variables Pooled OLS	OLS with robust cluster standard errors	OLS Firm Specific Effects	OLS Time Effects	Yes OLS Firm Specific & Time Effects
Intercept	0.0391 *** (13.71)	0.0391 *** (13.02)	0.0391 *** (13.02)	0.0391 ** (2.26)	-0.0761 *** (-6.19)
BE/ME	0.0113 ** (2.18)	0.0113 * (1.82)	0.0113 * (1.82)	0.0113 *** (2.82)	0.0116 *** (4.23)
Industry BE /ME	0.1140 *** (11.60)	0.1140 *** (11.64)	0.1140 *** (11.64)	0.1140 ** (2.49)	-0.0024 (-0.36)
Breusch-Pagan LM test					
Hausman test					
Observations	1,980	1,980	1,980	1,980	1,980
Multicollinearity (vif)					
Heteroskedasticity					
Serial Correlation (F- stat)					
R-Squared	0.1060	0.1060	0.1060	0.1060	0.7512
Adjusted R-Squared	0.1051	0.1051	0.1051	0.1051	0.75

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.0227
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where

R^2 = sample R-square

p = Number of predictors

N = Total sample size.

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1-R2	0.2488
N-1	1,979
N-p-1	1,977
	0.249052

Results of Panel Data Analysis - Model 4

	Dependent Variables				Yes
	Pooled OLS	OLS with robust cluster standard errors	OLS Firm Specific Effects	OLS Time Effects	OLS Firm Specific & Time Effects
Intercept	0.0273	0.0273	0.0273	0.0273	-0.0736 **
	(1.33)	(1.53)	(1.53)	(1.53)	(-5.11)
BE/ME	0.0112 **	0.0120 *	0.0120 *	0.0120 ***	0.0114 ***
	(2.25)	(1.87)	(1.87)	(3.01)	(4.03)
Industry BE /ME	0.1141 ***	0.1141 ***	0.1141 ***	0.1141 ***	-0.0026
	(11.61)	(11.49)	(11.49)	(2.49)	(-0.40)
ME	0.0006	0.0006	0.0006	0.0006	-0.0001
	(0.58)	(0.66)	(0.66)	(0.96)	(-0.31)
Breusch-Pagan LM test					
Hausman test					
Observations	1,980	1,980	1,980	1,980	1,980
Multicollinearity (vif)					
Heteroskedasticity					
Serial Correlation (F- stat)					
R-Squared	0.1062	0.1062	0.1062	0.1062	0.7512
Adjusted R-Squared	0.1048	0.1048	0.1048	0.1048	0.75

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.0000
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.25
N-1	1,979
N-p-1	1,976
	0.25

Results of Panel Data Analysis - Model 5

					Yes
	Dependent Variables				
	Pooled OLS	OLS with robust cluster standard errors	OLS Firm Specific Effects	OLS Time Effects	OLS Firm Specific & Time Effects
Intercept	0.0036	0.0036	0.0036	0.0036	-0.0828 ***
	(0.16)	(0.21)	(0.21)	(0.18)	(-4.79)
BE/ME	0.0115 **	0.0115 *	0.0115 *	0.0115 ***	0.0113 ***
	(2.17)	(1.84)	(1.84)	(2.88)	(3.54)
Industry BE /ME	0.1171 ***	0.1171 ***	0.1171 ***	0.1171 **	0.0007
	(11.82)	(11.91)	(11.91)	(2.49)	(0.08)
ME	0.0006	0.0006	0.0006	0.0006	-0.0001
	(0.57)	(0.67)	(0.67)	(0.93)	(-0.24)
Beta	0.0198 **	0.0198 **	0.0198 **	0.0198	0.0082
	(2.27)	(2.28)	(2.28)	(1.16)	(1.11)
Breusch-Pagan LM test					
Hausman test					
Observations	1,980	1,980	1,980	1,980	1,980
Multicollinearity (vif)					
Heteroskedasticity					
Serial Correlation (F- stat)					
R-Squared	0.1085	0.1085	0.1085	0.1085	0.7512
Adjusted R-Squared	0.1067	0.1067	0.1067	0.1067	0.75

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.0472
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.25
N-1	1,979
N-p-1	1,975
	0.25

Table 11 Regression Results of Monthly Portfolio Returns on Portfolio BE/ME, Industry BE/ME, and Control Variables
OLS Time Effects

Model	BE /ME	Industry BE /ME	ME	Beta	Adjusted R- Squared
1	-0.0034				0.0003
	(-0.50)				
2		-0.0122			0.0017
		(-0.47)			
3	-0.0011	-0.0113			0.0014
	(-0.25)	(-0.43)			
4	0.0006	-0.0106	-0.0019		0.0020
	(0.13)	(-0.40)	(-1.12)		
5	0.003	-0.0028	-0.0025	0.013	0.0075
	(0.51)	(0.14)	(-1.64)	(0.68)	

Results of Panel Data Analysis - Model 1

	Dependent Variable		Yes	
	Pooled OLS	OLS Firm Specific Effects	OLS Time Effects	OLS Firm Specific & Time Effects
Intercept	0.0027	0.0027	0.0027	0.0291 ***
	(0.72)	(1.16)	(0.18)	(5.20)
BE/ME	-0.0034	-0.0034 **	-0.0034	-0.0040 ***
	(0.0025)	(-2.06)	(-0.50)	(-2.28)
Breusch-Pagan LM test				
Hausman test				
Observations	2,605	2,605	2,605	2,605
Multicollinearity (vif)				
Heteroskedasticity				
Serial Correlation (F- stat)				
R-Squared	0.0007	0.0007	0.0007	0.6045
Adjusted R -Squared	0.0003	0.0003	0.0003	0.6043

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	1.0000

Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.3955
N-1	2,604
N-p-1	2,603
	0.3957

Results of Panel Data Analysis - Model 2

	Dependent Variable		Yes	
	Pooled OLS	OLS Firm Specific Effects	OLS Time Effects	OLS Firm Specific & Time Effects
Intercept	-0.0078	-0.0078 **	-0.0078	0.0117
	(-1.18)	(-2.28)	(-0.22)	(1.50)
Industry BE /ME	-0.0123 **	-0.0123 ***	-0.0122	-0.0170 ***
	(-2.35)	(-4.32)	(-0.47)	(-3.48)
Breusch-Pagan LM test				
Hausman test				
Observations	2,605	2,605	2,605	2,605
Multicollinearity (vif)				
Heteroskedasticity				
Serial Correlation (F- stat)				
R-Squared	0.0021	0.0021	0.0021	0.6061
Adjusted R -Squared	0.0017	0.0017	0.0017	0.6059

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	1.0000

Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.3939
N-1	2,604
N-p-1	2,603
	0.394051

Results of Panel Data Analysis - Model 3

	Dependent Variable		Yes	
	Pooled OLS	OLS Firm Specific Effects	OLS Time Effects	OLS Firm Specific & Time Effects
Intercept	-0.0081	-0.0081 **	-0.0081	0.0114 *
	(-1.21)	(-2.33)	(-0.23)	(1.76)
BE/ME	-0.0011	-0.0011	-0.0011	-0.0019
	(-0.39)	(-0.68)	(-0.25)	(-1.21)
Industry BE /ME	-0.0113 **	-0.0113 ***	-0.0113	-0.0153 ***
	(-1.96)	(-3.95)	(-0.43)	(-4.20)
Breusch-Pagan LM test				
Hausman test				
Observations	2,605	2,605	2,605	2,605
Multicollinearity (vif)				
Heteroskedasticity				
Serial Correlation (F- stat)				
R-Squared	0.0022	0.0022	0.0022	0.6063
Adjusted R -Squared	0.0014	0.0014	0.0014	0.6060

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	1.0000

Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where

R^2 = sample R-square

p = Number of predictors

N = Total sample size.

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1-R2	0.3937
N-1	2,604
N-p-1	2,602
	0.3940

Results of Panel Data Analysis - Model 4

	Dependent Variable		Yes	
	Pooled OLS	OLS Firm Specific Effects	OLS Time Effects	OLS Firm Specific & Time Effects
Intercept	0.0352	0.0352 *	0.0352	0.0277
	(1.29)	(1.76)	(0.56)	(1.58)
BE/ME	0.0006	0.0006	0.0006	-0.0013
	(0.20)	(0.33)	(0.13)	(-0.78)
Industry BE /ME	-0.0106 *	-0.0106 ***	-0.0106	-0.0147 ***
	(-1.83)	(-3.61)	(-0.40)	(-3.85)
ME	0.0191	-0.0019 **	-0.0019	-0.0007
	(-1.63)	(-2.18)	(-1.12)	(-0.98)
Breusch-Pagan LM test				
Hausman test				
Observations	2,605	2,605	2,605	2,605
Multicollinearity (vif)				
Heteroskedasticity				
Serial Correlation (F- stat)				
R-Squared	0.0032	0.0032	0.0032	0.6064
Adjusted R -Squared	0.0020	0.0020	0.0020	0.6059

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	1.0000
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.3936
N-1	2,604
N-p-1	2,601
	0.3941

Results of Panel Data Analysis - Model 5

	Dependent Variable				Yes		
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects	OLS Firm Specific & Time Effects	
Intercept	0.0565	**	0.0565	***	0.0565	0.0275	
	(2.03)		(2.70)		(1.09)	(1.56)	
BE/ME	0.0030		0.003		0.003	-0.0020	
	(1.00)		(1.42)		(0.51)	(-1.22)	
Industry BE /ME	-0.0028		-0.0028		-0.0028	-0.0143	***
	(-0.46)		(0.78)		(0.14)	(-3.54)	
ME	-0.0025	**	-0.0025	**	-0.0025	-0.0006	
	(-2.13)		(-2.82)		(-1.64)	(-0.81)	
Beta	0.13	***	0.013	***	0.013	-0.0040	
	(3.90)		(4.54)		(0.68)	(-0.71)	
Breusch-Pagan LM test							
Hausman test							
Observations	2,605		2,605		2,605	2,605	
Multicollinearity (vif)							
Heteroskedasticity							
Serial Correlation (F- stat)							
R-Squared	0.0090		0.0090		0.0090	0.6067	
Adjusted R -Squared	0.0075		0.0075		0.0075	0.6061	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.9870
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.3933
N-1	2,604
N-p-1	2,600
	0.393905

Lim, Chee Ming (2017) Noise-augmented asset pricing models:Evidence from the Greater China stock markets during two major financial crises. PhD thesis, University of Nottingham.

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Table 11 Regression Results of Monthly Portfolio Returns on Portfolio BE/ME, Industry BE/ME, and Control Variables
OLS Firm Specific and Time Effects

Model	BE /ME		Industry BE /ME	ME	Beta	Adjusetd R- Squared
1	-0.0094	**				0.0029
	(-2.28)					
2			-0.0158			0.0010
			(-0.93)			
3	-0.0082	**	-0.0082			0.0027
	(-2.50)		(-0.49)			
4	-0.0116	***	-0.0054	-0.0037		0.0052
	(-2.63)		(-0.32)	(-1.60)		
5	-0.0124	***	-0.0079	-0.0036	-0.0079	0.0058
	(-2.61)		(-0.44)	(-1.59)	(-0.43)	

Results of Panel Data Analysis - Model 1

					Yes			
	Dependent Variable							
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects		OLS Firm Specific & Time Effects	
Intercept	0.0199	***	0.0199	***	0.0199		0.0655	***
	(5.79)		(6.13)		(1.49)		(3.10)	
BE/ME	-0.0094	***	-0.0094	***	-0.0094	**	-0.0080	***
	(-2.69)		(-3.07)		(-2.28)		(-2.78)	
Breusch-Pagan LM test								
Hausman test								
Observations	2,170		2,170		2,170		2,170	
Multicollinearity (vif)								
Heteroskedasticity								
Serial Correlation (F- stat)								
R-Squared	0.0033		0.0033		0.0033		0.2163	
Adjusted R-Squared	0.0029		0.0029		0.0029		0.2159	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.3441
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.7837
N-1	2,169
N-p-1	2,168
	0.7841

Results of Panel Data Analysis - Model 2

	Dependent Variables				Yes			
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects		OLS Firm Specific & Time Effects	
Intercept	0.0248	***	0.0248	***	0.0248	*	0.0674	***
	(6.21)		(6.84)		(1.71)		(3.12)	
Industry BE /ME	-0.0158	*	-0.0158	***	-0.0158		-0.0001	
	(-1.78)		(-2.64)		(-0.93)		(-0.01)	
Breusch-Pagan LM test								
Hausman test								
Observations	2,170		2,170		2,170		2,170	
Multicollinearity (vif)								
Heteroskedasticity								
Serial Correlation (F- stat)								
R-Squared	0.0015		0.0015		0.0015		0.2139	
Adjusted R-Squared	0.0010		0.0010		0.0010		0.2135	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.1779
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.7861
N-1	2,169
N-p-1	2,168
	0.7865

Results of Panel Data Analysis - Model 3

			Yes	
	Dependent Variables			
	Pooled OLS	OLS Firm Specific Effects	OLS Time Effects	OLS Firm Specific & Time Effects
Intercept	0.0220 ***	0.0220 ***	0.0220	0.0646 ***
	(5.23)	(6.24)	(1.51)	(3.05)
BE/ME	-0.0082 ***	-0.0082 **	-0.0082 **	-0.0091 ***
	(-2.20)	(-2.36)	(-2.50)	(-2.66)
Industry BE /ME	-0.0082	-0.0082	-0.0082	0.0089
	(-0.85)	(-1.19)	(-0.49)	(1.00)
Breusch-Pagan LM test				
Hausman test				
Observations	2,170	2,170	2,170	2,170
Multicollinearity (vif)				
Heteroskedasticity				
Serial Correlation (F- stat)				
R-Squared	0.0037	0.0037	0.0037	0.2166
Adjusted R-Squared	0.0027	0.0027	0.0027	0.2162

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.2818
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.

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1-R2	0.7834
N-1	2,169
N-p-1	2,168
	0.7838

Results of Panel Data Analysis - Model 4

	Dependent Variables Pooled OLS	OLS Firm Specific Effects	Yes OLS Time Effects	OLS Firm Specific & Time Effects
Intercept	0.0961 ***	0.0961 ***	0.0961 **	0.1352 ***
	(3.21)	(2.40)	(2.04)	(3.17)
BE/ME	-0.0116 ***	-0.0116 ***	-0.0116 ***	-0.0123 ***
	(-2.91)	(-3.05)	(-2.63)	(-3.23)
Industry BE /ME	-0.0054	-0.0054	-0.0054	0.0141
	(-0.56)	(-0.75)	(-0.32)	(1.51)
ME	-0.0037 ***	-0.0037 *	-0.0037	-0.0035 *
	(-2.50)	(-1.88)	(-1.60)	(-1.80)
Breusch-Pagan LM test				
Hausman test				
Observations	2,170	2,170	2,170	2,170
Multicollinearity (vif)				
Heteroskedasticity				
Serial Correlation (F- stat)				
R-Squared	0.0065	0.0065	0.0065	0.1416
Adjusted R-Squared	0.0052	0.0052	0.0052	0.1404

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.2378
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.8584
N-1	2,169
N-p-1	2,166
	0.8596

Results of Panel Data Analysis - Model 5

					Yes			
	Dependent Variables							
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects		OLS Firm Specific & Time Effects	
Intercept	0.0923	***	0.0923	**	0.0923	**	0.1015	***
	(3.07)		(2.12)		(2.02)		(2.59)	
BE/ME	-0.0124	***	-0.0124	***	-0.0124	***	-0.0122	***
	(-3.10)		(-2.98)		(-2.61)		(-2.65)	
Industry BE /ME	-0.0079		-0.0079		-0.0079		0.0142	
	(-0.81)		(-0.85)		(-0.44)		(1.53)	
ME	-0.0036	***	-0.0036	*	-0.0036		-0.0035	*
	(-2.43)		(-1.69)		(-1.59)		(-1.77)	
Beta	-0.0079		-0.0079		-0.0079		0.0010	
	(-1.57)		(-0.53)		(-0.43)		(0.06)	
Breusch-Pagan LM test								
Hausman test								
Observations	2,170		2,170		2,170		2,170	
Multicollinearity (vif)								
Heteroskedasticity								
Serial Correlation (F- stat)								
R-Squared	0.0077		0.0077		0.0077		0.2162	
Adjusted R-Squared	0.0058		0.0058		0.0058		0.2148	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.1425
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.7838
N-1	2,169
N-p-1	2,165
	0.7852

Table 11 Regression Results of Monthly Portfolio Returns on Portfolio BE/ME, Industry BE/ME, and Control Variables
OLS Time Effects

Model	BE /ME	Industry BE /ME		ME		Beta		Adjusted R- Squared
1	0.00							0.0002
	(0.93)							
2		0.0244						0.0010
		(0.60)						
3	0.0032	0.0208						0.0007
	(0.76)	(0.52)						
4	0.0023	0.0195		-0.0012	*			0.0012
	(0.54)	(0.48)		(-1.80)				
5	0.0004	0.0607	*	-0.0003		0.0324	**	0.0882
	(0.09)	(1.74)		(-0.58)		(2.02)		

Results of Panel Data Analysis - Model 1

	Dependent Variable		Yes	
	Pooled OLS	OLS Firm Specific Effects	OLS Time Effects	OLS Firm Specific & Time Effects
Intercept	0.0093 ***	0.0093 ***	0.0093	0.1423 ***
	(3.53)	(4.89)	(0.66)	(13.67)
BE/ME	0.0049	0.0049	0.0049	0.0063 *
	(1.17)	(1.42)	(0.93)	(1.81)
Breusch-Pagan LM test				
Hausman test				
Observations	1,595	1,595	1,595	1,595
Multicollinearity (vif)				
Heteroskedasticity				
Serial Correlation (F- stat)				
R-Squared	0.0009	0.0009	0.0009	0.7357
Adjusted R-Squared	0.0002	0.0002	0.0002	0.7355

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	1.0000

Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where

R^2 = sample R-square

p = Number of predictors

N = Total sample size.

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1-R2	0.2643
N-1	1,594
N-p-1	1,593
	0.264466

Results of Panel Data Analysis - Model 2

					Yes		
	Dependent Variables						
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects	OLS Firm Specific & Time Effects	
Intercept	0.0136	***	0.0136	***	0.0136	0.1514	***
	(3.10)		(4.33)		(0.82)	(13.75)	
Industry BE /ME	0.0244		0.0244	**	0.0244	0.0413	***
	(1.59)		(2.12)		(0.60)	(3.85)	
Breusch-Pagan LM test							
Hausman test							
Observations	1,595		1,595		1,595	1,595	
Multicollinearity (vif)							
Heteroskedasticity							
Serial Correlation (F- stat)							
R-Squared	0.0016		0.0016		0.0016	0.7382	
Adjusted R-Squared	0.0010		0.0010		0.0010	0.7382	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	1.0000
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.

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1-R2	0.2618
N-1	1,594
N-p-1	1,594
	0.2618

Results of Panel Data Analysis - Model 3

	Dependent Variables		Yes	
	Pooled OLS	OLS Firm Specific Effects	OLS Time Effects	OLS Firm Specific & Time Effects
Intercept	0.0138 ***	0.0138 ***	0.0138	0.1517 ***
	(3.15)	(4.42)	(0.84)	(13.80)
BE/ME	0.0032	0.0032	0.0032	0.0035
	(0.72)	(1.05)	(0.76)	(1.24)
Industry BE /ME	0.0208	0.0208 **	0.0208	0.0373 ***
	(1.30)	(2.06)	(0.52)	(4.34)
Breusch-Pagan LM test				
Hausman test				
Observations	1,595	1,595	1,595	1,595
Multicollinearity (vif)				
Heteroskedasticity				
Serial Correlation (F- stat)				
R-Squared	0.0019	0.0019	0.0019	0.7386
Adjusted R-Squared	0.0007	0.0007	0.0007	0.7383
Test for the presence of fixed firm effect				
Fixed Effect Model - F test (p-value)	1.0000			
Test for the presence of time effect				
Time Dummies - F test (p-value)	0.0000			

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where

R^2 = sample R-square

p = Number of predictors

N = Total sample size.

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1-R2	0.2614
N-1	1,594
N-p-1	1,592
	0.2617

Results of Panel Data Analysis - Model 4

	Dependent Variables		Yes	
	Pooled OLS	OLS Firm Specific Effects	OLS Time Effects	OLS Firm Specific & Time Effects
Intercept	0.0370 **	0.0370 ***	0.0370 *	0.1599 ***
	(2.09)	(2.58)	(1.88)	(12.23)
BE/ME	0.0023	0.0023	0.0023	0.0032
	(0.52)	(0.73)	(0.54)	(1.11)
Industry BE /ME	0.0195	0.0195 *	0.0195	0.0365 ***
	(1.21)	(1.81)	(0.48)	(4.17)
ME	-0.0012	-0.0012 *	-0.0012 *	-0.0005
	(-1.35)	(-1.72)	(-1.80)	(-1.15)
Breusch-Pagan LM test				
Hausman test				
Observations	1,595	1,595	1,595	1,595
Multicollinearity (vif)				
Heteroskedasticity				
Serial Correlation (F- stat)				
R-Squared	0.0031	0.0031	0.0031	0.7388
Adjusted R-Squared	0.0012	0.0012	0.0012	0.7383

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	1.0000

Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.2612
N-1	1,594
N-p-1	1,591
	0.2617

Results of Panel Data Analysis - Model 5

	Dependent Variables			Yes				
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects		OLS Firm Specific & Time Effects	
Intercept	0.0133		0.0133		0.0133		0.1493	***
	(0.78)		(1.37)		(0.70)		(11.02)	
BE/ME	0.0004		0.0004		0.0004		0.0026	
	(0.09)		(0.15)		(0.09)		(1.01)	
Industry BE /ME	0.0607	***	0.0607	***	0.0607	*	0.0395	***
	(3.86)		(7.20)		(1.74)		(4.32)	
ME	-0.0003		-0.0003		-0.0003		-0.0004	
	(-0.31)		(-0.52)		(-0.58)		(-1.08)	
Beta	0.0324	***	0.0324	***	0.0324	**	0.0081	
	(12.36)		(20.82)		(2.02)		(1.50)	
Breusch-Pagan LM test								
Hausman test								
Observations	1,595		1,595		1,595		1,595	
Multicollinearity (vif)								
Heteroskedasticity								
Serial Correlation (F- stat)								
R-Squared	0.0905		0.0905		0.0905		0.7396	
Adjusted R-Squared	0.0882		0.0882		0.0882		0.7391	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.9990

Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.2604
N-1	1,594
N-p-1	1,591
	0.2609

Lim, Chee Ming (2017) Noise-augmented asset pricing models:Evidence from the Greater China stock markets during two major financial crises. PhD thesis, University of Nottingham.

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Table 12 Regression Results of Monthly Portfolio Returns on Portfolio BE /ME and Control Variables by Industry

Industry	BE /ME	Industry BE /ME	ME	Beta	Adjusted R-Squared	Standard Errors
Automobiles & Parts	0.0313 * (1.92)	-0.0563 *** (-3.79)	-0.0046 (-0.52)	-0.1936 *** (-11.89)	0.2007	CL - T
Beverages	0.0054 (0.72)	0.1537 *** (2.82)	-0.0015 (-0.70)	-0.0937 ** (-1.98)	0.2008	CL - T
Construction & Materials	0.0169 (1.12)	0.2250 ** (2.06)	-0.0055 * (-1.89)	-0.0036 (-0.05)	0.0616	CL-T
Electricity	-0.0096 (-0.63)	0.2868 * (1.88)	-0.0026 *** (-2.82)	-0.0906 ** (-2.40)	0.1441	CL - T
Electronic & Electrical Equipment	-0.0028 (-0.47)	0.1464 (1.58)	0.0053 (1.32)	-0.2551 ** (-2.49)	0.1650	CL - T
Food Producers	0.0112 (1.45)	0.1488 * (1.65)	-0.0011 (-0.19)	-0.0821 (-1.21)	0.1066	CL - T
General Retailers	-0.0078 (-1.36)	0.0251 *** (2.85)	-0.0042 (-1.45)	-0.0939 (-1.47)	0.2068	CL - T
Household Goods & Home Construction	-0.0044 (-0.40)	0.1737 ** (2.16)	-0.0001 (-0.01)	-0.1193 ** (-2.00)	0.1409	CL - T
Industrial Engineering	0.0029 (0.33)	0.2675 *** (2.80)	0.0097 (0.90)	0.0009 (0.12)	0.1525	CL - T
Industrial Metal & Mining	-0.0098 (-0.92)	0.3335 *** (2.84)	-0.0022 (-0.42)	0.0557 * (1.70)	0.1898	CL - T
Industrial Transportation	-0.0066 (-0.39)	0.1795 ** (2.27)	0.0003 (0.16)	-0.0842 (-0.84)	0.1855	CL - T
Mining	-0.0016 (-0.14)	0.4842 *** (2.99)	-0.0017 (-0.75)	0.1158 (1.06)	0.1733	CL - T
Personal Goods	0.0075 (1.61)	0.0884 * (1.77)	0.0094 * (1.91)	-0.2190 *** (-3.11)	0.3089	CL - T
Pharmaceuticals & Biotechnology	0.0206 *** (3.33)	0.1206 * (1.90)	0.0113 (1.09)	-0.0795 (-1.62)	0.1222	CL - T
Real Estates & Investment Services	0.0584 (1.24)	0.2366 *** (3.09)	-0.0314 (-1.42)	-0.0007 (-0.09)	0.1304	CL - T
Software & Computer Services	-0.0098 (-0.95)	0.1407 ** (2.45)	0.0015 (0.18)	-0.0812 * (-1.78)	0.1021	CL - T
Technology Hardware & Equipment	-0.0126 (-1.17)	0.1873 *** (2.97)	-0.0010 (-0.18)	-0.0795 (-1.48)	0.1637	CL - T
Travel & Leisure	0.0110 * (1.84)	0.2418 *** (2.64)	-0.0013 (-0.27)	0.0118 (0.36)	0.2356	CL - T

Results of Panel Data Analysis - Automobiles & Parts

	Dependent Variables					
					Yes	
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects	
Intercept	0.3023		0.3024		0.3024	
	(1.57)		(1.66)		(3.07)	
BE/ME	0.0313	*	0.0313	***	0.0313	*
	(1.95)		(3.18)		(1.92)	
Industry BE /ME	-0.0563	***	-0.0563		-0.0563	***
	(-2.66)		(-1.25)		(-3.79)	
ME	-0.0045		-0.0046		-0.0046	
	(-0.49)		(-1.36)		(-0.52)	
Beta	-0.1936	***	-0.1936	***	-0.1936	***
	(-5.31)		(-3.36)		(-11.89)	
Breusch-Pagan LM test						
Hausman test						
Observations	180		180		180	
Multicollinearity (vif)						
Heteroskedasticity (χ^2 - Stat)						
Serial Correlation (F- stat)						
R-Squared	0.2185		0.2185		0.2185	
Adjused R-Squared	0.2007		0.2007		0.2007	
Test for the presence of fixed firm effect						
Fixed Effect Model - F test (p-value)	0.1090					
Test for the presence of time effect						
Time Dummies - F test (p-value)	0.0000					

Results of Panel Data Analysis - Beverages

	Dependent Variables					
					Yes	
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects	
Intercept	0.3581	***	0.3581	***	0.3581	***
	(3.08)		(8.47)		(4.17)	
BE/ME	0.0054		0.0054		0.0054	
	(0.39)		(0.38)		(0.72)	
Industry BE /ME	0.1537	***	0.1537	***	0.1537	***
	(4.16)		(4.60)		(2.82)	
ME	-0.0015		-0.0015		-0.0015	
	(-0.29)		(-0.42)		(-0.70)	
Beta	-0.0937	***	-0.0937	***	-0.0937	**
	(-3.82)		(-11.22)		(-1.98)	
Breusch-Pagan LM test						
Hausman test						
Observations	180		180		180	
Multicollinearity (vif)						
Heteroskedasticity (χ^2 - Stat)						
Serial Correlation (F- stat)						
R-Squared	0.2187		0.2187		0.2187	
Adjused R-Squared	0.2008		0.2008		0.2008	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.2701

Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

Results of Panel Data Analysis - Construction & Materials

	Dependent Variables					
					Yes	
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects	
Intercept	0.4206	***	0.4206	***	0.4206	***
	(3.08)		(5.28)		(2.97)	
BE/ME	0.0169		0.0169	***	0.0169	
	(0.82)		(2.56)		(1.12)	
Industry BE /ME	0.2250	***	0.2250	***	0.2250	**
	(2.58)		(15.10)		(2.06)	
ME	-0.0055		-0.0055		-0.0055	*
	(-0.98)		(-1.33)		(-1.89)	
Beta	-0.0036		-0.0036		-0.0036	
	(-0.10)		(-0.12)		(-0.05)	
Breusch-Pagan LM test						
Hausman test						
Observations	180		180		180	
Multicollinearity (vif)						
Heteroskedasticity (χ^2 - Stat)						
Serial Correlation (F- stat)						
R-Squared	0.0825		0.0825		0.0825	
Adjused R-Squared	0.0616		0.0616		0.0616	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.8669
Test for the presence of time effect	0.0000
Time Dummies - F test (p-value)	

Results of Panel Data Analysis - Electricity

	Dependent Variables Pooled OLS		OLS Firm Specific Effects		OLS Time Effects	
Intercept	0.4388	***	0.4388	***	0.4388	***
	(2.40)		(14.47)		(3.01)	
BE/ME	-0.0096		-0.0096	***	-0.0096	
	(-0.33)		(-2.03)		(-0.63)	
Industry BE /ME	0.2868	***	0.2868	***	0.2868	*
	(3.46)		(6.62)		(1.88)	
ME	-0.0026		-0.0026		-0.0026	***
	(-0.35)		(-1.53)		(-2.82)	
Beta	-0.0906		-0.0906	**	-0.0906	**
	(-1.16)		(-2.07)		(-2.40)	
Breusch-Pagan LM test						
Hausman test						
Observations	180		180		180	
Multicollinearity (vif)						
Heteroskedasticity (χ^2 - Stat)						
Serial Correlation (F- stat)						
R-Squared	0.1633		0.1633		0.1633	
Adjused R-Squared	0.1441		0.1441		0.1441	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.8985
Test for the presence of time effect	0.0000
Time Dummies - F test (p-value)	

Results of Panel Data Analysis - Electronic & Electrical Equipment

	Dependent Variables					
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects	
Intercept	0.3433		0.3433	***	0.3433	**
	(1.42)		(3.90)		(2.34)	
BE/ME	-0.0028		-0.0028		-0.0028	
	(-0.22)		(-0.31)		(-0.47)	
Industry BE /ME	0.1464	***	0.1464	***	0.1464	
	(2.34)		(8.62)		(1.58)	
ME	0.0053		0.0053		0.0053	
	(0.40)		(1.12)		(1.32)	
Beta	-0.2551	***	-0.2551	***	-0.2551	**
	(-6.01)		(-14.39)		(-2.49)	
Breusch-Pagan LM test						
Hausman test						
Observations	180		180		180	
Multicollinearity (vif)						
Heteroskedasticity (χ^2 - Stat)						
Serial Correlation (F- stat)						
R-Squared	0.1837		0.1837		0.1837	
Adjused R-Squared	0.1650		0.1650		0.1650	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.7736

Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

Results of Panel Data Analysis - Food Producers

	Dependent Variables Pooled OLS		OLS Firm Specific Effects		OLS Time Effects	
Intercept	0.3467		0.3467	**	0.3467	**
	(0.98)		(2.01)		(2.05)	
BE/ME	0.0112		0.0112		0.0112	
	(0.51)		(1.00)		(1.45)	
Industry BE /ME	0.1488	**	0.1488	***	0.1488	*
	(2.12)		(5.72)		(1.65)	
ME	-0.0011		-0.0011		-0.0011	
	(-0.06)		(-0.13)		(-0.19)	
Beta	-0.0821	**	-0.0821	***	-0.0821	
	(-2.04)		(-8.58)		(-1.21)	
Breusch-Pagan LM test						
Hausman test						
Observations	180		180		180	
Multicollinearity (vif)						
Heteroskedasticity (χ^2 - Stat)						
Serial Correlation (F- stat)						
R-Squared	0.1266		0.1266		0.1266	
Adjused R-Squared	0.1066		0.1066		0.1066	
Test for the presence of fixed firm effect						
Fixed Effect Model - F test (p-value)	0.6314					
Test for the presence of time effect						
Time Dummies - F test (p-value)	0.0000					

Results of Panel Data Analysis - General Retailers

	Dependent Variables					
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects	
Intercept	0.4092	***	0.4092	***	0.4092	
	(2.61)		(6.11)		(3.46)	
BE/ME	-0.0078		-0.0078		-0.0078	
	(-0.55)		(-1.04)		(-1.36)	
Industry BE /ME	0.1852	***	0.0251	***	0.0251	***
	(4.54)		(6.58)		(2.85)	
ME	-0.0042		-0.0042		-0.0042	
	(-0.53)		(-0.99)		(-1.45)	
Beta	-0.0939	***	-0.0939	***	-0.0939	
	(-2.87)		(-6.72)		(-1.47)	
Breusch-Pagan LM test						
Hausman test						
Observations	180		180		180	
Multicollinearity (vif)						
Heteroskedasticity (χ^2 - Stat)						
Serial Correlation (F- stat)						
R-Squared	0.2245		0.2245		0.2245	
Adjused R-Squared	0.2068		0.2068		0.2068	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.7158
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

Results of Panel Data Analysis - Household Goods & Home Construction

	Dependent Variables					
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects	
Intercept	0.3491	*	0.3392		0.3392	**
	(1.79)		(0.99)		(2.02)	
BE/ME	-0.0044		-0.0044		-0.0044	
	(-0.23)		(-0.30)		(-0.40)	
Industry BE /ME	0.1737	**	0.1737	**	0.1737	**
	(3.25)		(3.98)		(2.16)	
ME	-0.0001		-0.0001		-0.0001	
	(-0.01)		(-0.00)		(-0.01)	
Beta	-0.1193	***	-0.1193	***	-0.1193	**
	(-3.38)		(-6.78)		(-2.00)	
Breusch-Pagan LM test						
Hausman test						
Observations	180		180		180	
Multicollinearity (vif)						
Heteroskedasticity (χ^2 - Stat)						
Serial Correlation (F- stat)						
R-Squared	0.1601		0.1601		0.1601	
Adjused R-Squared	0.1409		0.1409		0.1409	
Test for the presence of fixed firm effect						
Fixed Effect Model - F test (p-value)	0.2931					
Test for the presence of time effect						
Time Dummies - F test (p-value)	0.0000					

Results of Panel Data Analysis - Industrial Engineering

	Dependent Variables					
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects	
Intercept	0.1367		0.1367	*	0.1367	
	(0.47)		(1.91)		(0.66)	
BE/ME	0.0029		0.0029		0.0029	
	(0.19)		(1.56)		(0.33)	
Industry BE /ME	0.2675	***	0.2675	***	0.2675	***
	(5.46)		(20.30)		(2.80)	
ME	0.0097		0.0097	***	0.0097	
	(0.67)		(2.32)		(0.90)	
Beta	0.0009		0.0009		0.0009	
	(0.15)		(1.12)		(0.12)	
Breusch-Pagan LM test						
Hausman test						
Observations	180		180		180	
Multicollinearity (vif)						
Heteroskedasticity (χ^2 - Stat)						
Serial Correlation (F- stat)						
R-Squared	0.1715		0.1715		0.1715	
Adjused R-Squared	0.1525		0.1525		0.1525	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.5903
Test for the presence of time effect	0.0000
Time Dummies - F test (p-value)	

Results of Panel Data Analysis - Industry Metal & Mining

	Dependent Variables					
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects	
Intercept	0.3178		0.3178	***	0.3178	**
	(0.88)		(5.25)		(2.05)	
BE/ME	-0.0098		-0.0098	***	-0.0098	
	(-0.31)		(-2.08)		(-0.92)	
Industry BE /ME	0.3336	***	0.3335	***	0.3335	***
	(4.46)		(33.63)		(2.84)	
ME	-0.0022		-0.0022		-0.0022	
	('0.14)		(-0.81)		(-0.42)	
Beta	0.0557		0.0557	***	0.0557	*
	(0.68)		(5.69)		(1.70)	
Breusch-Pagan LM test						
Hausman test						
Observations	180		180		180	
Multicollinearity (vif)						
Heteroskedasticity (χ^2 - Stat)						
Serial Correlation (F- stat)						
R-Squared	0.2079		0.2079		0.2079	
Adjused R-Squared	0.1898		0.1898		0.1898	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.9892
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

Results of Panel Data Analysis - Industrial Transportation

	Dependent Variables					
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects	
Intercept	0.1947	*	0.1947	***	0.1947	***
	(1.74)		(9.10)		(2.58)	
BE/ME	-0.0066		-0.0066	***	-0.0066	
	(-0.34)		(-2.61)		(-0.39)	
Industry BE /ME	0.1795	***	0.1795	***	0.1795	**
	(3.45)		(9.72)		(2.27)	
ME	0.0003		0.0003		0.0003	
	(0.06)		(0.025)		(0.16)	
Beta	-0.0842		-0.0842	***	-0.0842	
	(-1.12)		(-2.56)		(-0.84)	
Breusch-Pagan LM test						
Hausman test						
Observations	180		180		180	
Multicollinearity (vif)						
Heteroskedasticity (χ^2 - Stat)						
Serial Correlation (F- stat)						
R-Squared	0.2037		0.2037		0.2037	
Adjused R-Squared	0.1855		0.1855		0.1855	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.9748
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

Results of Panel Data Analysis - Mining

	Dependent Variables					
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects	
Intercept	0.5767	***	0.5767	***	0.5767	**
	(3.25)		(13.38)		(2.44)	
BE/ME	-0.0016		-0.0016		-0.0016	
	(-0.07)		(-0.42)		(-0.14)	
Industry BE /ME	0.4842	***	0.4842	***	0.4842	***
	(6.11)		(35.83)		(2.99)	
ME	-0.0017		-0.0017		-0.0017	
	(-0.28)		(-1.48)		(-0.75)	
Beta	0.1158		0.1158	***	0.1158	
	(1.47)		(14.11)		(1.06)	
Breusch-Pagan LM test						
Hausman test						
Observations	180		180		180	
Multicollinearity (vif)						
Heteroskedasticity (χ^2 - Stat)						
Serial Correlation (F- stat)						
R-Squared	0.1918		0.1918		0.1918	
Adjused R-Squared	0.1733		0.1733		0.1733	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.9954
Test for the presence of time effect	0.0000
Time Dummies - F test (p-value)	

Results of Panel Data Analysis - Personal Goods

	Dependent Variables					
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects	
Intercept	0.1242		0.1242	*	0.1242	
	(0.69)		(1.87)		(1.15)	
BE/ME	0.0075		0.0075		0.0075	
	(0.87)		(1.09)		(1.61)	
Industry BE /ME	0.0884	***	0.0884	***	0.0884	*
	(2.72)		(4.68)		(1.77)	
ME	0.0094		0.0094	***	0.0094	*
	(1.00)		(2.88)		(1.91)	
Beta	-0.2190	***	-0.2190	***	-0.2190	***
	(-6.46)		(-12.18)		(-3.11)	
Breusch-Pagan LM test						
Hausman test						
Observations	180		180		180	
Multicollinearity (vif)						
Heteroskedasticity (χ^2 - Stat)						
Serial Correlation (F- stat)						
R-Squared	0.3244		0.3244		0.3244	
Adjused R-Squared	0.3089		0.3089		0.3089	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.1099

Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

Results of Panel Data Analysis - Pharmaceuticals & Biotechnology

	Dependent Variables					
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects	
Intercept	0.0530		0.0530		0.0530	
	(0.18)		(0.44)		(0.30)	
BE/ME	0.0256		0.0206	***	0.0206	***
	(1.57)		(5.41)		(3.33)	
Industry BE /ME	0.1206	***	0.1206	***	0.1206	*
	(2.39)		(4.66)		(1.90)	
ME	0.0113		0.0113		0.0113	
	(0.70)		(1.43)		(1.09)	
Beta	-0.0795	***	-0.0795	***	-0.0795	
	(-3.40)		(-5.86)		(-1.62)	
Breusch-Pagan LM test						
Hausman test						
Observations	180		180		180	
Multicollinearity (vif)						
Heteroskedasticity (χ^2 - Stat)						
Serial Correlation (F- stat)						
R-Squared	0.1418		0.1418		0.1418	
Adjused R-Squared	0.1222		0.1222		0.1222	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.1457
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

Results of Panel Data Analysis - Real Estates & Investment Services

	Dependent Variables					
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects	
Intercept	1.1042	***	1.1042	***	1.1042	
	(2.34)		(3.06)		(1.88)	
BE/ME	0.0584	*	0.0584	***	0.0584	
	(1.84)		(5.90)		(1.24)	
Industry BE /ME	0.2366	***	0.2366	***	0.2366	***
	(3.51)		(4.20)		(3.09)	
ME	-0.0314		-0.0314	**	-0.0314	
	(-1.43)		(-2.24)		(-1.42)	
Beta	-0.0007		-0.0007		-0.0007	
	(-0.06)		(-0.12)		(-0.09)	
Breusch-Pagan LM test						
Hausman test						
Observations	180		180		180	
Multicollinearity (vif)						
Heteroskedasticity (χ^2 - Stat)						
Serial Correlation (F- stat)						
R-Squared	0.1498		0.1498		0.1498	
Adjused R-Squared	0.1304		0.1304		0.1304	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.6895
Test for the presence of time effect	0.0000
Time Dummies - F test (p-value)	

Results of Panel Data Analysis - Software & Computer Services

	Dependent Variables					
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects	
Intercept	0.1917		0.1917		0.1917	
	(0.69)		(1.06)		(1.19)	
BE/ME	-0.0098		-0.0098		-0.0098	
	(-0.65)		(-1.29)		(-0.95)	
Industry BE /ME	0.1407	***	0.1407	***	0.1407	**
	(3.76)		(5.59)		(2.45)	
ME	0.0015		0.0015		0.0015	
	(0.11)		(0.16)		(0.18)	
Beta	-0.0812	**	-0.0812	***	-0.0812	*
	(-2.30)		(-3.30)		(-1.78)	
Breusch-Pagan LM test						
Hausman test						
Observations	180		180		180	
Multicollinearity (vif)						
Heteroskedasticity (χ^2 - Stat)						
Serial Correlation (F- stat)						
R-Squared	0.1221		0.1221		0.1221	
Adjused R-Squared	0.1021		0.1021		0.1021	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.4345

Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

Results of Panel Data Analysis - Technology Hardware & Equipment

	Dependent Variables					
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects	
Intercept	0.3340	*	0.3340		0.3340	***
	(1.73)		(1.32)		(3.03)	
BE/ME	-0.0126		-0.0126	***	-0.0126	
	(-0.91)		(-2.75)		(-1.17)	
Industry BE /ME	0.1873	***	0.1873	***	0.1873	***
	(4.53)		(4.73)		(2.97)	
ME	-0.0010		-0.0010		-0.0010	
	(-0.10)		(-0.09)		(-0.18)	
Beta	-0.0795	***	-0.0795	***	-0.0795	
	(-2.79)		(-5.31)		(-1.48)	
Breusch-Pagan LM test						
Hausman test						
Observations	180		180		180	
Multicollinearity (vif)						
Heteroskedasticity (χ^2 - Stat)						
Serial Correlation (F- stat)						
R-Squared	0.1824		0.1824		0.1824	
Adjused R-Squared	0.1637		0.1637		0.1637	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.3135

Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

Results of Panel Data Analysis - Travel & Leisure

	Dependent Variables					
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects	
Intercept	0.3551	**	0.3551	***	0.3551	**
	(2.11)		(13.55)		(1.96)	
BE/ME	0.0110		0.0110	***	0.0110	*
	(0.77)		(7.21)		(1.84)	
Industry BE /ME	0.2418	***	0.2418	***	0.2418	***
	(2.80)		(13.70)		(2.64)	
ME	-0.0013		-0.0013	**	-0.0013	
	(-0.20)		(-1.98)		(-0.27)	
Beta	0.0118		0.0118	*	0.0118	
	(0.28)		(1.79)		(0.36)	
Breusch-Pagan LM test						
Hausman test						
Observations	170		170		170	
Multicollinearity (vif)						
Heteroskedasticity (χ^2 - Stat)						
Serial Correlation (F- stat)						
R-Squared	0.2537		0.2537		0.2537	
Adjused R-Squared	0.2356		0.2356		0.2356	
Test for the presence of fixed firm effect						
Fixed Effect Model - F test (p-value)	0.9928					
Test for the presence of time effect						
Time Dummies - F test (p-value)	0.0000					

Table 12 Regression Results of Monthly Portfolio Returns on Portfolio BE /ME and Control Variables by Industry

Industry	BE /ME		Industry BE /ME		ME		Beta		Adjusted R-Squared	Standard Errors
Construction & Materials	-0.0373	*	0.29	***	-0.0018		-0.0220		0.1210	CL - T
	(-1.83)		(2.85)		(-0.30)		(-0.88)			
Electronic & Electrical Equipment	0.0197		0.1848	***	0.0096		-0.0029		0.1025	CL - T
	(0.64)		(5.97)		(0.54)		(-0.11)			
Financial Services	-0.0227	***	0.1841	***	0.0084	***	-0.0911	***	0.0775	CL - T
	(-3.62)		(5.66)		(2.58)		(-9.65)			
Food Producers	0.0363	*	0.0083		0.0154		0.11	**	0.1119	CL - T
	(1.82)		(0.17)		(1.64)		(2.46)			
General Retailers	-0.0068		0.1231	*	-0.0150	***	-0.0487	**	0.1104	CL - T
	(-0.62)		(1.72)		(-2.60)		(-2.13)			
Household Goods & Home Construction	0.0102		0.1631	**	0.0061		0.0149		0.1013	CL - T
	(0.98)		(2.50)		(0.76)		(0.57)			
Leisure Goods	-0.0293		0.2046	***	0.0040		0.0126		0.0375	CL - T
	(-0.97)		(2.88)		(0.18)		(0.31)			
Media	-0.0690	*	0.3630	***	-0.0320		0.0110		0.0742	White
	(-1.87)		(3.23)		(-1.00)		(0.36)			
Personal Goods	-0.0445	***	0.1828	**	-0.0086	*	-0.0147		0.0543	CL - T
	(-3.62)		(2.36)		(-1.66)		(-0.41)			
Pharmaceuticals & Biotechnology	0.0114		0.2235	**	0.0093		0.0033		0.0795	CL - T
	(1.26)		(2.24)		(1.31)		(0.13)			
Real Estates & Investment Services	0.0196		0.3753	***	0.0193		0.0856		0.1398	CL - T
	(1.06)		(2.59)		(1.47)		(1.31)			
Software & Computer Services	0.0063		0.1475	*	0.0101		0.0830	**	0.0399	CL - T
	(0.41)		(1.92)		(1.36)		(1.96)			
Technology Hardware & Equipment	-0.0216	***	0.1490	***	-0.0027		0.0159		0.1129	CL - T
	(-3.00)		(2.85)		(-0.53)		(0.69)			
Travel & Leisure	-0.0190	*	0.2373	***	-0.0064		0.0104		0.1660	CL - T
	(-1.81)		(2.89)		(-0.60)		(0.54)			

Results of Panel Data Analysis - Construction & Materials

	Pooled OLS		OLS Firm Specific Effects		Yes OLS Time Effects		OLS Firm Specific & Time Effects	
	Dependent Variables							
Intercept	-0.0460		-0.0460		-0.0460		-0.1774	
	(-0.17)		(-0.31)		(-0.39)		(-1.44)	
BE/ME	-0.0373	**	-0.0373	**	-0.0373	*	-0.0358	**
	(-2.06)		(-2.22)		(-1.83)		(-1.96)	
Industry BE /ME	0.2886	***	0.2886	***	0.2886	***	1.2840	***
	(4.92)		(12.32)		(2.85)		(11.06)	
ME	-0.0018		-0.0018		-0.0018		-0.0090	
	(-0.14)		(-0.30)		(-0.30)		(-1.42)	
Beta	-0.0220		-0.0220		-0.0220		-0.0499	**
	(-0.64)		(-0.53)		(-0.88)		(-2.02)	
Breusch-Pagan LM test								
Hausman test								
Observations	180		180		180		180	
Multicollinearity (vif)								
Heteroskedasticity (χ^2 - Stat)								
Serial Correlation (F- stat)								
R-Squared	0.1406		0.1406		0.1406		0.7028	
Adjused R-Squared	0.1210		0.1210		0.1210		0.70	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.0904
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.

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1-R2	0.2972
N-1	179
N-p-1	175

0.30

Results of Panel Data Analysis - Electronic & Electrical Equipment

			Yes	
	Dependent Variables			
	Pooled OLS	OLS Firm Specific Effects	OLS Time Effects	OLS Firm Specific & Time Effects
Intercept	-0.2652	-0.2652	-0.2652	-0.3993 **
	(-0.62)	(-0.79)	(-0.79)	(-2.51)
BE/ME	0.0197	0.0197	0.0197	0.0168
	(0.47)	(0.64)	(0.64)	(0.99)
Industry BE /ME	0.1848 ***	0.1848 ***	0.1848 ***	0.2731 ***
	(4.36)	(5.97)	(5.97)	(2.63)
ME	0.0097	0.0096	0.0096	0.0073
	(0.44)	(0.54)	(0.54)	(0.73)
Beta	-0.0029	-0.0029	-0.0029	-0.0151
	(-0.09)	(-0.11)	(-0.11)	(-1.28)
Breusch-Pagan LM test				
Hausman test				
Observations	180	180	180	180
Multicollinearity (vif)				
Heteroskedasticity (χ^2 - Stat)				
Serial Correlation (F- stat)				
R-Squared	0.1225	0.1225	0.1225	0.1225
Adjused R-Squared	0.1025	0.1025	0.1025	0.1025

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.9196
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.

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Results of Panel Data Analysis - Financial Services

			Yes	
	Dependent Variables			
	Pooled OLS	OLS Firm Specific Effects	OLS Time Effects	OLS Firm Specific & Time Effects
Intercept	-0.2740	-0.2740	-0.2740 ***	-0.3383 ***
	(-0.26)	(-0.80)	(-3.49)	(-2.46)
BE/ME	-0.0227	-0.0227	-0.0227 ***	-0.0246 ***
	(-0.61)	(-1.45)	(-3.62)	(-3.29)
Industry BE /ME	0.1841 **	0.1841 ***	0.1841 ***	0.3102 ***
	(2.04)	(2.69)	(5.66)	(7.77)
ME	0.0084	0.0084	0.0084 ***	0.0046
	(0.17)	(0.56)	(2.58)	(0.60)
Beta	-0.0911 ***	-0.0911	-0.0911 ***	-0.0877 ***
	(-3.06)	(-0.97)	(-9.65)	(-8.30)
Breusch-Pagan LM test				
Hausman test				
Observations	180	180	180	180
Multicollinearity (vif)				
Heteroskedasticity (χ^2 - Stat)				
Serial Correlation (F- stat)				
R-Squared	0.0981	0.0981	0.0981	0.3657
Adjused R-Squared	0.0775	0.0775	0.0775	0.351202

Test for the presence of fixed firm effect		
Fixed Effect Model - F test (p-value)	0.9809	
Test for the presence of time effect		
Time Dummies - F test (p-value)	0.0128	

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where

R^2 = sample R-square

p = Number of predictors

N = Total sample size.

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1-R2	0.6343
N-1	179
N-p-1	175
	0.648798

Results of Panel Data Analysis - Food Producers

	Dependent Variables			
			Yes	
	Pooled OLS	OLS Firm Specific Effects	OLS Time Effects	OLS Firm Specific & Time Effects
Intercept	-0.2375	-0.2375	-0.2375	-0.1314
	(-1.25)	(-1.60)	(-1.34)	(-1.09)
BE/ME	0.0363	0.0363	0.0363 *	0.0026
	(1.59)	(1.43)	(1.82)	(0.19)
Industry BE /ME	0.0083	0.0083	0.0083	0.2773 **
	(0.17)	(0.15)	(0.17)	(2.16)
ME	0.0154	0.0154 **	0.0154	0.0014
	(1.56)	(1.97)	(1.64)	(0.23)
Beta	0.1121 ***	0.1121 *	0.1121 *	0.0515
	(2.99)	(1.89)	(2.46)	(0.88)
Breusch-Pagan LM test				
Hausman test				
Observations	180	180	180	180
Multicollinearity (vif)				
Heteroskedasticity (χ^2 - Stat)				
Serial Correlation (F- stat)				
R-Squared	0.1317	0.1317	0.1317	0.6551
Adjused R-Squared	0.1119	0.1119	0.1119	0.65

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.0601
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.

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1-R2	0.3449
N-1	179
N-p-1	175
	0.352783

Results of Panel Data Analysis - General Retailers

					Yes			
	Dependent Variables							
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects		OLS Firm Specific & Time Effects	
Intercept	0.3016		0.3016		0.3016	**	0.0752	
	(1.07)		(0.62)		(2.55)		(1.14)	
BE/ME	-0.0068		-0.0068		-0.0068		-0.0006	
	(-0.21)		(-0.14)		(-0.62)		(-0.04)	
Industry BE /ME	0.1231	***	0.1231	***	0.1231	*	0.1418	**
	(2.79)		(5.18)		(1.72)		(2.35)	
ME	-0.0150		-0.0150		-0.0150	***	-0.0113	***
	(-1.04)		(-0.61)		(-2.60)		(-2.90)	
Beta	-0.0487	*	-0.0487		-0.0487	**	-0.0313	***
	(-1.89)		(-1.02)		(-2.13)		(-2.57)	
Breusch-Pagan LM test								
Hausman test								
Observations	180		180		180		180	
Multicollinearity (vif)								
Heteroskedasticity (χ^2 - Stat)								
Serial Correlation (F- stat)								
R-Squared	0.1303		0.1303		0.1303		0.1303	
Adjused R-Squared	0.1104		0.1104		0.1104		0.1104	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.1542

Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where

R^2 = sample R-square

p = Number of predictors

N = Total sample size.

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1-R2

N-1

N-p-1

Results of Panel Data Analysis - Household Goods & Home Construction

			Yes	
	Dependent Variables			
	Pooled OLS	OLS Firm Specific Effects	OLS Time Effects	OLS Firm Specific & Time Effects
Intercept	-0.0973	-0.0973	-0.0973	-0.1036
	(-0.36)	(-0.48)	(-0.60)	(-1.35)
BE/ME	0.0102	0.0102 *	0.0102 *	0.0073 **
	(0.72)	(1.91)	(0.98)	(2.26)
Industry BE /ME	0.1631 ***	0.1631 ***	0.1631 **	0.0283
	(3.80)	(5.90)	(2.50)	(0.29)
ME	0.0061	0.0061	0.0061	0.0030
	(0.44)	(0.59)	(0.76)	(0.65)
Beta	0.0149	0.0149	0.0149	0.0021
	(0.48)	(0.79)	(0.57)	(0.33)
Breusch-Pagan LM test				
Hausman test				
Observations	180	180	180	180
Multicollinearity (vif)				
Heteroskedasticity (χ^2 - Stat)				
Serial Correlation (F- stat)				
R-Squared	0.1214	0.1214	0.1214	0.6850
Adjused R-Squared	0.1013	0.1013	0.1013	0.68

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.2882
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1- \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.

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1-R2	0.3150
N-1	179
N-p-1	175
	0.32

Results of Panel Data Analysis -Leisure Goods

	Dependent Variables				Yes			
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects		OLS Firm Specific & Time Effects	
Intercept	-0.0896		-0.0896		-0.0896		-0.2331	
	(-0.19)		(-0.25)		(-0.20)		(-0.90)	
BE/ME	-0.0293		-0.0293	***	-0.0293		-0.0323	***
	(-0.91)		(-3.87)		(-0.97)		(-4.32)	
Industry BE /ME	0.2046	***	0.2046	***	0.2046	***	0.3442	***
	(3.02)		(4.37)		(2.88)		(5.42)	
ME	0.0040		0.0040		0.0040		-0.0001	
	(0.17)		(0.22)		(0.18)		(-0.00)	
Beta	0.0126		0.0126		0.0126		0.0131	
	(0.58)		(0.84)		(0.31)		(0.54)	
Breusch-Pagan LM test								
Hausman test								
Observations	180		180		180		180	
Multicollinearity (vif)								
Heteroskedasticity (χ^2 - Stat)								
Serial Correlation (F- stat)								
R-Squared	0.0590		0.0590		0.0590		0.3227	
Adjused R-Squared	0.0375		0.0375		0.0375		0.0375	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.8662
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0284

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where

R^2 = sample R-square

p = Number of predictors

N = Total sample size.

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1-R2

N-1

N-p-1

Results of Panel Data Analysis - Media

	Yes Dependent Variables Pooled OLS	OLS Firm Specific Effects	OLS Time Effects	OLS Firm Specific & Time Effects
Intercept	0.6477 (1.03)	0.6477 ** (2.43)	0.6477 (1.30)	1.1013 *** (2.72)
BE/ME	-0.0690 * (-1.87)	-0.0690 *** (-2.59)	-0.0690 (-1.62)	-0.0864 *** (-3.01)
Industry BE /ME	0.3630 *** (3.23)	0.3630 *** (2.81)	0.3630 * (1.94)	0.1875 (0.70)
ME	-0.0320 (-1.00)	-0.0320 ** (-2.17)	-0.0320 (-1.24)	-0.0569 *** (-2.43)
Beta	0.0110 (0.36)	0.0110 (0.27)	0.0110 (0.20)	0.0084 (0.20)
Breusch-Pagan LM test				
Hausman test				
Observations	180	180	180	180
Multicollinearity (vif)				
Heteroskedasticity (χ^2 - Stat)				
Serial Correlation (F- stat)				
R-Squared	0.0949	0.0949	0.0949	0.3241
Adjused R-Squared	0.0742	0.0742	0.0742	0.31

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.4697

Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0878

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.

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1-R2	0.6759
N-1	179
N-p-1	175

0.691349

Results of Panel Data Analysis - Personal Goods

	Dependent Variables				Yes			
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects		OLS Firm Specific & Time Effects	
Intercept	0.1261		0.1261	*	0.1261		-0.3908	*
	(0.55)		(1.65)		(1.30)		(-1.87)	
BE/ME	-0.0445	*	-0.0445	***	-0.0445	***	-0.0277	
	(-1.95)		(-2.68)		(-3.62)		(-1.35)	
Industry BE /ME	0.1828	***	0.1828	***	0.1828	**	0.4286	***
	(2.79)		(6.05)		(2.36)		(3.23)	
ME	-0.0086		-0.0086	**	-0.0086	*	0.0047	
	(-0.87)		(-2.49)		(-1.66)		(0.52)	
Beta	-0.0147		-0.0147		-0.0147		-0.0008	
	(-0.51)		(-0.55)		(-0.41)		(-0.10)	
Breusch-Pagan LM test								
Hausman test								
Observations	180		180		180		180	
Multicollinearity (vif)								
Heteroskedasticity (χ^2 - Stat)								
Serial Correlation (F- stat)								
R-Squared	0.0755		0.0755		0.0755		0.5596	
Adjused R-Squared	0.0543		0.0543		0.0543		0.0543	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.2029

Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where

R^2 = sample R-square

p = Number of predictors

N = Total sample size.

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1-R2

N-1

N-p-1

Results of Panel Data Analysis - Pharmaceuticals & Biotechnology

	Dependent Variables			Yes
	Pooled OLS	OLS Firm Specific Effects	OLS Time Effects	OLS Firm Specific & Time Effects
Intercept	-0.1170	-0.1170	-0.1170	-0.0449
	(-0.55)	(-0.45)	(-0.82)	(-0.31)
BE/ME	0.0114	0.0114	0.0114	0.0083
	(0.91)	(1.11)	(1.26)	(1.57)
Industry BE /ME	0.2235 ***	0.2235 ***	0.2235 ***	0.5464 ***
	(3.88)	(8.79)	(2.24)	(3.37)
ME	0.0093	0.0093	0.0093	0.0034
	(0.86)	(0.71)	(1.31)	(0.58)
Beta	0.0033	0.0033	0.0033	0.0006
	(0.12)	(0.11)	(0.13)	(0.05)
Breusch-Pagan LM test				
Hausman test				
Observations	180	180	180	180
Multicollinearity (vif)				
Heteroskedasticity (χ^2 - Stat)				
Serial Correlation (F- stat)				
R-Squared	0.1001	0.1001	0.1001	0.7249
Adjused R-Squared	0.0795	0.0795	0.0795	0.72

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.7600

Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.

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1-R2	0.2751
N-1	179
N-p-1	175

0.281388

Results of Panel Data Analysis - Real Estates & Investment Services

	Dependent Variables		Yes	
	Pooled OLS	OLS Firm Specific Effects	OLS Time Effects	OLS Firm Specific & Time Effects
Intercept	-0.6331	-0.6331 **	-0.6331 **	-0.1671
	(-1.32)	(-2.00)	(-2.00)	(-1.59)
BE/ME	0.0196	0.0196	0.0196	-0.0082 ***
	(0.57)	(0.95)	(1.06)	(-2.55)
Industry BE /ME	0.3753 ***	0.3753 ***	0.3753 ***	omitted
	(4.80)	(5.47)	(2.59)	
ME	0.0193	0.0193	0.0193	-0.0004
	(0.92)	(1.46)	(1.47)	(-0.11)
Beta	0.0856	0.0856 **	0.0856	0.0035
	(1.47)	(1.98)	(1.31)	(0.17)
Breusch-Pagan LM test				
Hausman test				
Observations	180	180	180	180
Multicollinearity (vif)				
Heteroskedasticity (χ^2 - Stat)				
Serial Correlation (F- stat)				
R-Squared	0.1591	0.1591	0.1591	0.9228
Adjused R-Squared	0.1398	0.1398	0.1398	0.921035

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.7539
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.0772
N-1	179
N-p-1	175
	0.078965

Results of Panel Data Analysis - Software & Computer Services

Yes

Dependent Variables	Pooled OLS	OLS Firm Specific Effects	OLS Time Effects	OLS Firm Specific & Time Effects
Intercept	-0.0542	-0.0542	-0.0542	-0.0912
	(-0.19)	(-0.17)	(-0.41)	(-1.62)
BE/ME	0.0063	0.0063	0.0063	-0.0083 **
	(0.30)	(0.34)	(0.41)	(-2.55)
Industry BE /ME	0.1475 ***	0.1475 ***	0.1475 *	0.6155 ***
	(2.93)	(3.42)	(1.92)	(8.61)
ME	0.0101	0.0101	0.0101	0.0084 ***
	(0.66)	(0.58)	(1.36)	(4.05)
Beta	0.0830 **	0.0830 **	0.0830 **	0.0112
	(2.36)	(2.25)	(1.96)	(1.03)
Breusch-Pagan LM test				
Hausman test				
Observations	180	180	180	180
Multicollinearity (vif)				
Heteroskedasticity (χ^2 - Stat)				
Serial Correlation (F- stat)				
R-Squared	0.0614	0.0614	0.0614	0.7418
Adjused R-Squared	0.0399	0.0399	0.0399	0.735898

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.0714

Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where

R^2 = sample R-square

p = Number of predictors

N = Total sample size.

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1-R2	0.2582
N-1	179
N-p-1	175

0.264102

Results of Panel Data Analysis - Technology Hardware & Equipment

	Dependent Variables Pooled OLS	OLS Firm Specific Effects	Yes OLS Time Effects	OLS Firm Specific & Time Effects
Intercept	0.0442 (0.25)	0.0442 (0.28)	0.0442 (0.41)	-0.2409 *** (-7.58)
BE/ME	-0.0216 (-1.42)	-0.0216 ** (-2.08)	-0.0216 ** (-3.00)	-0.0135 ** (-1.99)
Industry BE /ME	0.1490 *** (5.12)	0.1490 *** (12.09)	0.1490 *** (2.85)	0.2669 *** (3.62)
ME	-0.0027 (-0.33)	-0.0027 (-0.39)	-0.0027 (-0.53)	0.0005 (0.45)
Beta	0.0159 (0.73)	0.0159 *** (4.09)	0.0159 (0.69)	-0.0016 (-0.18)
Breusch-Pagan LM test				
Hausman test				
Observations	180	180	180	180
Multicollinearity (vif)				
Heteroskedasticity (χ^2 - Stat)				
Serial Correlation (F- stat)				
R-Squared	0.1327	0.1327	0.1327	0.8002
Adjused R-Squared	0.1129	0.1129	0.1129	0.795633

Test for the presence of fixed firm effect

Fixed Effect Model - F test (p-value) 0.4175

Test for the presence of time effect

Time Dummies - F test (p-value) 0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where

R^2 = sample R-square

p = Number of predictors

N = Total sample size.

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1-R2	0.1998
N-1	179
N-p-1	175

0.204367

Results of Panel Data Analysis - Travel & Leisure

					Yes			
	Dependent Variables							
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects		OLS Firm Specific & Time Effects	
Intercept	0.0892		0.0892	**	0.0892		0.0612	
	(0.41)		(2.08)		(0.36)		(1.09)	
BE/ME	-0.0190		-0.0190	**	-0.0190	*	-0.0188	***
	(-1.32)		(-5.67)		(-1.81)		(-7.45)	
Industry BE /ME	0.2373	***	0.2373	***	0.2373	***	0.2040	***
	(4.94)		(12.88)		(2.89)		(5.37)	
ME	-0.0064		-0.0064	***	-0.0064		-0.0094	***
	(-0.65)		(-3.09)		(-0.60)		(-3.75)	
Beta	0.0104		0.0104		0.0104		0.0141	
	(0.38)		(1.49)		(0.54)		(1.23)	
Breusch-Pagan LM test								
Hausman test								
Observations	180		180		180		180	
Multicollinearity (vif)								
Heteroskedasticity (χ^2 - Stat)								
Serial Correlation (F- stat)								
R-Squared	0.1847		0.1847		0.1847		0.7206	
Adjused R-Squared	0.1660		0.1660		0.1660		0.714214	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.7687
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.2794
N-1	179
N-p-1	175

0.285786

Table 12 Regression Results of Monthly Portfolio Returns on Portfolio BE /ME and Control Variables by Industry

Industry	BE /ME		Industry BE /ME		ME		Beta		Adjusted R-Squared	Standard Errors
Automobiles & Parts	0.0114		0.1360	**	0.0013		0.0615	*	0.1540	CL - T
	(1.02)		(2.47)		(0.47)		(1.94)			
Chemicals	0.0498	*	0.1006	*	0.0067	*	0.0494		0.0961	CL - T
	(2.27)		(1.82)		(1.67)		(1.63)			
Construction & Materials	0.0247	*	0.1305	**	0.0084	*	-0.0675		0.1059	CL - T
	(1.80)		(1.96)		(1.65)		(-1.18)			
Electronic & Electrical Equipment	0.0227	***	0.1471	***	0.0026		-0.0247		0.1640	CL - T
	(2.86)		(2.61)		(1.42)		(-0.83)			
Industrial Engineering	-0.0529		0.1956	***	-0.0302	*	0.0847		0.1219	CL - T
	(-1.57)		(2.87)		(-1.73)		(1.27)			
Industry Metal & Mining	0.0403	***	0.1262	*	-0.0010		0.0230		0.0860	CL - T
	(3.64)		(1.69)		(-0.49)		(0.85)			
Leisure Goods	0.0094		0.1896	***	0.0015		0.0277		0.1524	CL - T
	(1.04)		(2.74)		(0.28)		(1.12)			
Personal Goods	0.0345	***	0.1250	*	0.0082	**	0.0082	***	0.1116	CL - T
	(2.62)		(1.95)		(2.14)		(2.97)			
Real Estates & Investment Services	-0.0085		0.1817	***	0.0047		-0.0177	**	0.1188	CL - T
	(-0.67)		(6.77)		(0.64)		(-2.35)			
Software & Computer Services	0.0075		0.1771	**	-0.0022		0.0410		0.0730	CL - T
	(0.81)		(2.36)		(-0.43)		(1.36)			
Technology Hardware & Equipment	0.0095		0.1842	***	-0.0022		-0.0711		0.2045	CL - T
	(1.38)		(2.89)		(-1.24)		(-1.35)			

Results of Panel Data Analysis - Automobile & Parts

	Dependent Variables				Yes			
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects		OLS Firm Specific & Time Effects	
Intercept	-0.0623		-0.0623		-0.0623		-0.0541	
	(-0.66)		(-0.76)		(-1.23)		(-1.36)	
BE/ME	0.0114		0.0114		0.0114		0.0198	***
	(0.69)		(0.73)		(1.02)		(3.45)	
Industry BE /ME	0.1360		0.1360		0.1360		0.0253	
	(4.35)	***	(5.18)	***	(2.47)	***	(0.38)	
ME	0.0013		0.0013		0.0013		0.0012	
	(0.26)		(0.25)		(0.47)		(0.44)	
Beta	0.0615		0.0615		0.0615		-0.0064	
	(2.13)	**	(5.25)	***	(1.94)	***	(-0.79)	
Breusch-Pagan LM test								
Hausman test								
Observations	180		180		180		180	
Multicollinearity (vif)								
Heteroskedasticity (χ^2 - Stat)								
Serial Correlation (F- stat)								
R-Squared	0.1729		0.1729		0.1729		0.8284	
Adjused R-Squared	0.1540		0.1540		0.1540		0.824478	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.4071
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.1716
N-1	179
N-p-1	175
	0.175522

Results of Panel Data Analysis - Chemicals

	Dependent Variables							
					Yes			
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects		OLS Firm Specific & Time Effects	
Intercept	-0.1552		-0.1552		-0.1552		-0.0561	***
	(-1.18)		(-1.19)		(-1.39)		(-7.47)	
BE/ME	0.0498		0.0498		0.0498	**	0.0161	***
	(1.66)	*	(1.84)	*	(2.27)		(4.45)	
Industry BE /ME	0.1006		0.1006		0.1006	*	0.2328	***
	(2.48)	**	(3.23)	***	(1.82)		(4.41)	
ME	0.0067		0.0067		0.0067	*	0.0001	
	(1.35)		(1.09)		(1.67)		(0.25)	
Beta	0.0494		0.0494		0.0494		0.0087	
	(0.88)		(0.64)		(1.63)		(1.27)	
Breusch-Pagan LM test								
Hausman test								
Observations	180		180		180		180	
Multicollinearity (vif)								
Heteroskedasticity (χ^2 - Stat)								
Serial Correlation (F- stat)								
R-Squared	0.1163		0.1163		0.1163		0.9175	
Adjused R-Squared	0.0961		0.0961		0.0961		0.9156	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.2970
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where

R^2 = sample R-square

p = Number of predictors

N = Total sample size.

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1-R2	0.0825
N-1	179
N-p-1	175
	0.08

Results of Panel Data Analysis - Construction & Materials

	Dependent Variables				Yes			
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects		OLS Firm Specific & Time Effects	
Intercept	-0.0399		-0.0399		-0.0399		-0.0795	
	(-0.30)		(-0.96)		(-0.69)		(-1.28)	
BE/ME	0.0247		0.0247	***	0.0247	*	0.0251	***
	(1.17)		(2.95)		(1.80)		(2.90)	
Industry BE /ME	0.1305	***	0.1305	***	0.1305	**	-0.0725	
	(3.88)		(7.89)		(1.96)		(-0.94)	
ME	0.0084		0.0084	***	0.0084	*	0.0086	***
	(1.23)		(2.88)		(1.65)		(2.94)	
Beta	-0.0675		-0.0675	***	-0.0675		-0.0700	***
	(-1.49)		(-4.45)		(-1.18)		(-3.77)	
Breusch-Pagan LM test								
Hausman test								
Observations	180		180		180		180	
Multicollinearity (vif)								
Heteroskedasticity (χ^2 - Stat)								
Serial Correlation (F- stat)								
R-Squared	0.1259		0.1259		0.1259		0.8644	
Adjused R-Squared	0.1059		0.1059		0.1059		0.861301	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.9819
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.1356
N-1	179
N-p-1	175
	0.138699

Results of Panel Data Analysis - Electronic & Electrical Equipment

	Dependent Variables Pooled OLS		OLS Firm Specific Effects		Yes OLS Time Effects		OLS Firm Specific & Time Effects	
Intercept	0.0236		0.0236		0.0236		-0.0917	
	(0.12)		(0.09)		(0.49)		(-1.61)	
BE/ME	0.0227		0.0227		0.0227	***	0.0123	***
	(0.98)		(1.08)		(2.86)		(4.11)	
Industry BE /ME	0.1471	***	0.1471	***	0.1471	***	0.4723	***
	(3.73)		(3.01)		(2.61)		(11.80)	
ME	0.0026		0.0026		0.0026		0.0010	
	(0.36)		(0.48)		(1.42)		(0.62)	
Beta	-0.0247		-0.0247		-0.0247		0.0125	
	(-0.31)		(-0.18)		(-0.83)		(0.54)	
Breusch-Pagan LM test								
Hausman test								
Observations	180		180		180		180	
Multicollinearity (vif)								
Heteroskedasticity (χ^2 - Stat)								
Serial Correlation (F- stat)								
R-Squared	0.1827		0.1827		0.1827		0.9640	
Adjused R-Squared	0.1640		0.1640		0.1640		0.963177	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.4871

Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.0360
N-1	179
N-p-1	175
	0.036823

Results of Panel Data Analysis - Industrial Engineering

					Yes			
	Dependent Variables							
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects		OLS Firm Specific & Time Effects	
Intercept	0.4477	*	0.4477	***	0.4477	**	0.0513	
	(1.94)		(4.18)		(1.90)		(0.67)	
BE/ME	-0.0529	*	-0.0529	***	-0.0529		-0.0065	
	(-1.70)		(-3.54)		(-1.57)		(-0.64)	
Industry BE /ME	0.1956	***	0.1956	***	0.1956	***	0.2450	***
	(4.71)		(7.51)		(2.87)		(4.67)	
ME	-0.0302	*	-0.0302	***	-0.0302	*	-0.0040	
	(-1.92)		(-3.58)		(-1.73)		(-0.60)	
Beta	0.0847	*	0.0847	**	0.0847		-0.0209	
	(1.87)		(2.19)		(1.27)		(-0.59)	
Breusch-Pagan LM test								
Hausman test								
Observations	180		180		180		180	
Multicollinearity (vif)								
Heteroskedasticity (χ^2 - Stat)								
Serial Correlation (F- stat)								
R-Squared	0.1415		0.1415		0.1415		0.7154	
Adjused R-Squared	0.1219		0.1219		0.1219		0.7089	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.8644
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where

R^2 = sample R-square

p = Number of predictors

N = Total sample size.

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1-R2	0.2846
N-1	179
N-p-1	175

0.291105

Results of Panel Data Analysis - Industry Metal & Mining

			Yes	
	Dependent Variables			
	Pooled OLS	OLS Firm Specific Effects	OLS Time Effects	OLS Firm Specific & Time Effects
Intercept	0.0225	0.0225	0.0225	-0.0557 ***
	(0.21)	(0.44)	(0.45)	(-2.33)
BE/ME	0.0403 *	0.0403 ***	0.0403 ***	0.0392 ***
	(1.65)	(5.24)	(3.64)	(9.64)
Industry BE /ME	0.1262 **	0.1262 ***	0.1262 *	omitted
	(2.13)	(4.69)	(1.69)	
ME	-0.0010	-0.0010	-0.0010	0.0003
	(-0.35)	(-1.17)	(-0.49)	(0.27)
Beta	0.0230	0.0230	0.0230	0.0175
	(0.40)	(0.76)	(0.85)	(1.42)
Breusch-Pagan LM test				
Hausman test				
Observations	180	180	180	180
Multicollinearity (vif)				
Heteroskedasticity (χ^2 - Stat)				
Serial Correlation (F- stat)				
R-Squared	0.1064	0.1064	0.1064	0.8788
Adjused R-Squared	0.0860	0.0860	0.0860	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.8945
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.

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1-R2	0.1212
N-1	179
N-p-1	175

Results of Panel Data Analysis -Leisure Goods

	Dependent Variables		Yes	
	Pooled OLS	OLS Firm Specific Effects	OLS Time Effects	OLS Firm Specific & Time Effects
Intercept	0.0336	0.0336	0.0336	0.2328 **
	(0.22)	(1.49)	(0.34)	(2.39)
BE/ME	0.0094	0.0094	0.0094	0.0094 **
	(0.64)	(1.21)	(1.04)	(2.09)
Industry BE /ME	0.1896 ***	0.1896 ***	0.1896 ***	0.8362 ***
	(4.28)	(6.25)	(2.74)	(5.63)
ME	0.0015	0.0015	0.0015	-0.0010
	(0.16)	(0.93)	(0.28)	(-0.27)
Beta	0.0277	0.0277 **	0.0277	0.0160
	(0.97)	(2.16)	(1.12)	(0.86)
Breusch-Pagan LM test				
Hausman test				
Observations	180	180	180	180
Multicollinearity (vif)				
Heteroskedasticity (χ^2 - Stat)				
Serial Correlation (F- stat)				
R-Squared	0.1713	0.1713	0.1713	0.7677
Adjused R-Squared	0.1524	0.1524	0.1524	0.7624

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.4947

Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.23
N-1	179
N-p-1	175
	0.24

Results of Panel Data Analysis - Personal Goods

	Dependent Variables				Yes			
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects		OLS Firm Specific & Time Effects	
Intercept	-0.2729		-0.2729	*	-0.2729	***	-0.2315	***
	(-1.40)		(-1.83)		(-2.67)		(-6.12)	
BE/ME	0.0345		0.0345	**	0.0345	***	0.0184	***
	(1.35)		(2.20)		(2.62)		(4.50)	
Industry BE /ME	0.1250	***	0.1250	***	0.1250	*	0.0335	
	(3.36)		(11.54)		(1.95)		(1.08)	
ME	0.0082		0.0082		0.0082	**	0.0033	**
	(1.18)		(1.46)		(2.14)		(2.53)	
Beta	0.1120		0.1120		0.0082	***	0.1078	***
	(1.12)		(1.45)		(2.97)		(4.78)	
Breusch-Pagan LM test								
Hausman test								
Observations	180		180		180		180	
Multicollinearity (vif)								
Heteroskedasticity (χ^2 - Stat)								
Serial Correlation (F- stat)								
R-Squared	0.1315		0.1315		0.1315		0.9037	
Adjused R-Squared	0.1116		0.1116		0.1116		0.9015	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.8777
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.0963
N-1	179
N-p-1	175

0.098501

Results of Panel Data Analysis - Real Estates & Investment Services

Yes

	Dependent Variables Pooled OLS	OLS Firm Specific Effects	OLS Time Effects	OLS Firm Specific & Time Effects
Intercept	0.1482 (0.06)	0.1482 (0.10)	0.1482 (0.22)	-0.0538 (-0.34)
BE/ME	-0.0085 (-0.30)	-0.0085 (-0.67)	-0.0085 (-0.66)	-0.0078 (-0.67)
Industry BE /ME	0.1817 *** (3.95)	0.1817 *** (6.77)	0.1817 *** (2.52)	-0.1177 *** (-3.50)
ME	0.0047 (0.34)	0.0047 (0.64)	0.0047 (1.38)	0.0011 (0.15)
Beta	-0.0177 (-0.74)	-0.0177 ** (-2.35)	-0.0177 (-0.56)	0.0060 (0.42)
Breusch-Pagan LM test				
Hausman test				
Observations	180	180	180	180
Multicollinearity (vif)				
Heteroskedasticity (χ^2 - Stat)				
Serial Correlation (F- stat)				
R-Squared	0.1385	0.1385	0.1385	0.6641
Adjused R-Squared	0.1188	0.1188	0.1188	0.6564

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.9124
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)\,(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.3359
N-1	179
N-p-1	175

0.3435777

Results of Panel Data Analysis - Software & Computer Services

	Dependent Variables			
			Yes	
	Pooled OLS	OLS Firm Specific Effects	OLS Time Effects	OLS Firm Specific & Time Effects
Intercept	0.0157	0.0157	0.0157	-0.0685
	(0.10)	(0.19)	(0.16)	(-0.70)
BE/ME	0.0075	0.0075	0.0075	0.0114 ***
	(0.46)	(1.25)	(0.81)	(2.50)
Industry BE /ME	0.1771 ***	0.1771 ***	0.1771 ***	omitted
	(2.93)	(2.97)	(2.36)	
ME	-0.0022	-0.0022	-0.0022	-0.0012
	(-0.25)	(-0.54)	(-0.43)	(-0.26)
Beta	0.0410	0.0410	0.0410	0.0197
	(1.20)	(1.21)	(1.36)	(1.26)
Breusch-Pagan LM test				
Hausman test				
Observations	180	180	180	180
Multicollinearity (vif)				
Heteroskedasticity (χ^2 - Stat)				
Serial Correlation (F- stat)				
R-Squared	0.0937	0.0937	0.0937	0.8245
Adjused R-Squared	0.0730	0.0730	0.0730	0.82

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.5716

Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.1755
N-1	179
N-p-1	175
	0.18

Results of Panel Data Analysis - Technology Hardware & Equipment

	Dependent Variables		Yes	
	Pooled OLS	OLS Firm Specific Effects	OLS Time Effects	OLS Firm Specific & Time Effects
Intercept	0.2238 *	0.2238 ***	0.2238 **	0.0707 *
	(1.83)	(10.31)	(2.13)	(1.92)
BE/ME	0.0095	0.0095 ***	0.0095	0.0133 ***
	(0.63)	(4.69)	(1.38)	(3.89)
Industry BE /ME	0.1842 ***	0.1842 ***	0.1842 ***	0.4925 ***
	(5.23)	(11.52)	(2.89)	(6.81)
ME	-0.0022	-0.0022 ***	-0.0022	-0.0000
	(-0.56)	(-2.91)	(-1.24)	(-0.04)
Beta	-0.0711	-0.0711 ***	-0.0711	-0.0018
	(-1.40)	(-2.74)	(-1.35)	(-0.10)
Breusch-Pagan LM test				
Hausman test				
Observations	180	180	180	180
Multicollinearity (vif)				
Heteroskedasticity (χ^2 - Stat)				
Serial Correlation (F- stat)				
R-Squared	0.2223	0.2223	0.2223	0.9481
Adjused R-Squared	0.2045	0.2045	0.2045	0.9469

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.9887

Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.0519
N-1	179
N-p-1	175

0.053086

Table 12 Regression Results of Monthly Portfolio Returns on Portfolio BE /ME and Control Variables by Industry

Industry	BE /ME	Industry BE /ME	ME	Beta	Adjusted R-Squared	Standard Errors
Automobiles & Parts	0.1042	0.0554	-0.0048	0.0372	0.0249	CL - T
	(1.09)	(0.74)	(-1.38)	(1.41)		
Beverages	-0.0145 *	0.0709	-0.0044	-0.0030	-0.0106	CL - T
	(-1.66)	(0.69)	(-1.07)	(-0.14)		
Construction & Materials	0.0136	0.0677	-0.0047	0.0330	0.0150	CL-T
	(0.95)	(0.83)	(-1.52)	(1.11)		
Electricity	-0.0003	0.1572	0.0073	0.0543	-0.0183	CL - T
	(-0.02)	(1.07)	(0.98)	(0.86)		
Electronic & Electrical Equipment	0.0049	omitted	-0.0062	0.1356	0.0671	CL - T
	(0.99)		(-1.10)	(1.35)		
Food Producers	0.0069	0.1102	-0.0208 **	0.0450	0.0119	CL - T
	(1.19)	(0.86)	(-1.97)	(1.33)		
General Retailers	0.0050	0.0290	-0.0019	0.0219	-0.0216	CL - T
	(0.80)	(0.46)	(-0.99)	(0.71)		
Household Goods & Home Construction	0.0107	0.0206	-0.0045	0.0377	0.0054	CL - T
	(0.86)	(0.29)	(-1.04)	(1.26)		
Industrial Engineering	0.0074	0.0844	-0.0022	0.0510 **	0.0750	CL - T
	(1.23)	(0.89)	(-1.07)	(1.99)		
Industrial Metal & Mining	-0.0065	0.0342	0.0002	0.0231	-0.0063	CL - T
	(-0.79)	(0.31)	(0.07)	(0.68)		
Industrial Transportation	0.0032	0.0338	-0.0004	0.0201	-0.0209	CL - T
	(0.25)	(0.42)	(-0.14)	(0.57)		
Mining	0.0026	0.0421	0.0029	0.0244	-0.0071	CL - T
	(0.20)	(0.30)	(1.10)	(0.78)		
Personal Goods	0.0028	0.0384	-0.0039	0.0252	-0.0174	CL - T
	(0.31)	(0.73)	(-0.49)	(0.89)		
Pharmaceuticals & Biotechnology	0.0163	-0.0141	-0.0282	-0.0258	-0.0134	CL - T
	(0.98)	(-0.21)	(-0.77)	(-0.64)		
Real Estates & Investment Services	-0.0102	0.0096	0.0022	-0.0186	-0.0043	CL - T
	(-1.37)	(0.14)	(0.77)	(-1.02)		
Software & Computer Services	-0.0142 *	-0.0321	-0.0026	0.0023	-0.0036	CL - T
	(-1.75)	(-0.48)	(-0.40)	(0.09)		
Technology Hardware & Equipment	0.0143	0.0241	-0.0049	0.0527 *	0.0237	CL - T
	(1.12)	(0.43)	(-1.26)	(1.87)		
Travel & Leisure	0.0099	0.0917	-0.0003	0.0603	0.0218	CL - T
	(1.24)	(1.12)	(-0.14)	(1.59)		

Results of Panel Data Analysis - Automobiles & Parts

	Dependent Variables				
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects
Intercept	0.1710		0.1710		0.1710
	(0.89)		(1.35)		(1.54)
BE/ME	0.1042		0.1042		0.1042
	(0.52)		(1.10)		(1.09)
Industry BE /ME	0.0554		0.0554	***	0.0554
	(1.29)		(2.74)		(0.74)
ME	-0.0048		-0.0048		-0.0048
	(-0.57)		(-0.91)		(-1.38)
Beta	0.0372	***	0.0372	***	0.0372
	(2.63)		(3.64)		(1.41)
Breusch-Pagan LM test					
Hausman test					
Observations	145		145		
Multicollinearity (vif)					
Heteroskedasticity (χ^2 - Stat)					
Serial Correlation (F- stat)					
R-Squared	0.0520		0.0520		0.0520
Adjused R-Squared	0.0249		0.0249		0.0249

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.6185
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

Results of Panel Data Analysis - Beverages

	Dependent Variables Pooled OLS		OLS Firm Specific Effects		OLS Time Effects	
Intercept	0.2064		0.2064	***	0.2064	
	(1.12)		(3.11)		(0.93)	
BE/ME	-0.0145		-0.0145	***	-0.0145	*
	(-0.98)		(-2.46)		(-1.66)	
Industry BE /ME	0.0709		0.0709	**	0.0709	
	(1.17)		(2.15)		(0.69)	
ME	-0.0044		-0.0044		-0.0044	
	(-0.61)		(-1.80)		(-1.07)	
Beta	-0.0030		-0.0030		-0.0030	
	(-0.23)		(-1.00)		(-0.14)	
Breusch-Pagan LM test						
Hausman test						
Observations	145		145		145	
Multicollinearity (vif)						
Heteroskedasticity (χ^2 - Stat)						
Serial Correlation (F- stat)						
R-Squared	0.0175		0.0175		0.0175	
Adjused R-Squared	-0.0106		-0.0106		-0.0106	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.9221
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

Results of Panel Data Analysis - Construction & Materials

	Dependent Variables				
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects
Intercept	0.1869		0.1869	***	0.1869
	(1.21)		(5.41)		(1.39)
BE/ME	0.0136		0.0136	***	0.0136
	(0.71)		(4.25)		(0.95)
Industry BE /ME	0.0677		0.0677	***	0.0677
	(1.59)		(3.80)		(0.83)
ME	-0.0047		-0.0047	***	-0.0047
	(-0.69)		(-2.43)		(-1.52)
Beta	0.0330	*	0.0330	***	0.0330
	(1.92)		(5.13)		(1.11)
Breusch-Pagan LM test					
Hausman test					
Observations	145		145		145
Multicollinearity (vif)					
Heteroskedasticity (χ^2 - Stat)					
Serial Correlation (F- stat)					
R-Squared	0.0424		0.0424		0.0424
Adjused R-Squared	0.0150		0.0150		0.0150

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.8621

Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

Results of Panel Data Analysis - Electricity

	Dependent Variables		
	Pooled OLS	OLS Firm Specific Effects	OLS Time Effects
Intercept	-0.2867	-0.2867	-0.2867
	(-0.13)	(-0.15)	(-0.25)
BE/ME	-0.0003	-0.0003	-0.0003
	(-0.01)	(-0.01)	(-0.02)
Industry BE /ME	0.1572	0.1572	0.1572
	(0.89)	(1.59)	(1.07)
ME	0.0073	0.0073	0.0073
	(0.77)	(0.99)	(0.98)
Beta	0.0543	0.0543	0.0543
	(0.78)	(1.14)	(0.86)
Breusch-Pagan LM test			
Hausman test			
Observations	145	145	145
Multicollinearity (vif)			
Heteroskedasticity (χ^2 - Stat)			
Serial Correlation (F- stat)			
R-Squared	0.0100	0.0100	0.0100
Adjused R-Squared	-0.0183	-0.0183	-0.0183
Test for the presence of fixed firm effect			
Fixed Effect Model - F test (p-value)	0.1394		
Test for the presence of time effect	0.0000		
Time Dummies - F test (p-value)			

Results of Panel Data Analysis - Electronic & Electrical Equipment

	Dependent Variables			
	Pooled OLS		OLS Firm Specific Effects	OLS Time Effects
Intercept	0.0557		0.0594	0.0594
	(0.23)		(0.42)	(0.34)
BE/ME	0.0071		0.0049	0.0049
	(0.60)		(0.69)	(0.99)
Industry BE /ME	-0.0544	*	omitted	omitted
	(-1.78)			
ME	-0.0062		-0.0062	-0.0062
	(-0.54)		(-0.95)	(-1.10)
Beta	0.0439	***	0.1356	0.1356
	(2.81)		(1.61)	(1.35)
Breusch-Pagan LM test				
Hausman test				
Observations	140		140	140
Multicollinearity (vif)				
Heteroskedasticity (χ^2 - Stat)				
Serial Correlation (F- stat)				
R-Squared	0.0940		0.4468	0.4468
Adjused R-Squared	0.0671		0.0671	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.9562
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

Results of Panel Data Analysis - Food Producers

	Dependent Variables					
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects	
Intercept	0.5922	*	0.5922	***	0.5922	*
	(1.66)		(2.54)		(1.68)	
BE/ME	0.0069		0.0069		0.0069	
	(0.53)		(1.16)		(1.19)	
Industry BE /ME	0.1102		0.1102	***	0.1102	
	(1.54)		(3.26)		(0.86)	
ME	-0.0208		-0.0208	**	-0.0208	**
	(-1.32)		(-2.16)		(-1.97)	
Beta	0.0450	**	0.0450	***	0.0450	
	(2.00)		(6.48)		(1.33)	
Breusch-Pagan LM test						
Hausman test						
Observations	145		145		145	
Multicollinearity (vif)						
Heteroskedasticity (χ^2 - Stat)						
Serial Correlation (F- stat)						
R-Squared	0.0393		0.0393		0.0393	
Adjused R-Squared	0.0119		0.0119		0.0119	
Test for the presence of fixed firm effect						
Fixed Effect Model - F test (p-value)	0.6727					
Test for the presence of time effect						
Time Dummies - F test (p-value)	0.0000					

Results of Panel Data Analysis - General Retailers

	Dependent Variables				
	Pooled OLS	OLS Firm Specific Effects		OLS Time Effects	
Intercept	0.0848	0.0848	**	0.0848	
	(0.73)	(2.15)		(0.97)	
BE/ME	0.0050	0.0050	*	0.0050	
	(0.47)	(1.87)		(0.80)	
Industry BE /ME	0.0290	0.0290	***	0.0290	
	(0.57)	(2.69)		(0.46)	
ME	-0.0019	-0.0019		-0.0019	
	(-0.37)	(-0.37)		(-0.99)	
Beta	0.0219	0.0219		0.0219	
	(0.79)	(0.79)		(0.71)	
Breusch-Pagan LM test					
Hausman test					
Observations	145	145		145	
Multicollinearity (vif)					
Heteroskedasticity (χ^2 - Stat)					
Serial Correlation (F- stat)					
R-Squared	0.0068	0.0068		0.0068	
Adjused R-Squared	-0.0216	-0.0216		-0.0216	
Test for the presence of fixed firm effect					
Fixed Effect Model - F test (p-value)	0.2099				
Test for the presence of time effect					
Time Dummies - F test (p-value)	0.0000				

Results of Panel Data Analysis - Household Goods & Home Construction

	Dependent Variables				
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects
Intercept	0.1330		0.1330		0.1330
	(0.92)		(1.46)		(0.98)
BE/ME	0.0107		0.0107		0.0107
	(0.75)		(1.18)		(0.86)
Industry BE /ME	0.0206		0.0206		0.0206
	(0.54)		(1.19)		(0.29)
ME	-0.0045		-0.0045		-0.0045
	(-0.69)		(-1.03)		(-1.04)
Beta	0.0377	*	0.0377	***	0.0377
	(1.89)		(7.14)		(1.26)
Breusch-Pagan LM test					
Hausman test					
Observations	145		145		145
Multicollinearity (vif)					
Heteroskedasticity (χ^2 - Stat)					
Serial Correlation (F- stat)					
R-Squared	0.0331		0.0331		0.0331
Adjused R-Squared	0.0054		0.0054		0.0054

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.3588
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

Results of Panel Data Analysis - Industrial Engineering

	Dependent Variables					
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects	
Intercept	0.1409		0.1409	***	0.1409	
	(0.78)		(3.51)		(1.04)	
BE/ME	0.0074		0.0074	***	0.0074	
	(0.64)		(4.07)		(1.23)	
Industry BE /ME	0.0844	*	0.0844	***	0.0844	
	(1.86)		(4.74)		(0.89)	
ME	-0.0022		-0.0022		-0.0022	
	(-0.26)		(-1.62)		(-1.07)	
Beta	0.0510	***	0.0510	***	0.0510	**
	(3.38)		(7.92)		(1.99)	
Breusch-Pagan LM test						
Hausman test						
Observations	145		145		145	
Multicollinearity (vif)						
Heteroskedasticity (χ^2 - Stat)						
Serial Correlation (F- stat)						
R-Squared	0.1007		0.1007		0.1007	
Adjused R-Squared	0.0750		0.0750		0.0750	
Test for the presence of fixed firm effect						
Fixed Effect Model - F test (p-value)	0.9423					
Test for the presence of time effect						
Time Dummies - F test (p-value)	0.0000					

Results of Panel Data Analysis - Industry Metal & Mining

	Dependent Variables		
	Pooled OLS	OLS Firm Specific Effects	OLS Time Effects
Intercept	0.0058	0.0058	0.0058
	(0.03)	(0.10)	(0.04)
BE/ME	-0.0065	-0.0065	-0.0065
	(-0.46)	(-1.67)	(-0.79)
Industry BE /ME	0.0342	0.0342	0.0342
	(0.52)	(2.21)	(0.31)
ME	0.0002	0.0002	0.0002
	(0.02)	(0.07)	(0.07)
Beta	0.0231	0.0231	0.0231
	(1.37)	(2.80)	(0.68)
Breusch-Pagan LM test			
Hausman test			
Observations	145	145	145
Multicollinearity (vif)			
Heteroskedasticity (χ^2 - Stat)			
Serial Correlation (F- stat)			
R-Squared	0.0217	0.0217	0.0217
Adjused R-Squared	-0.0063	-0.0063	-0.0063

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.7684

Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

Results of Panel Data Analysis - Industrial Transportation

	Dependent Variables Pooled OLS	OLS Firm Specific Effects	OLS Time Effects
Intercept	0.0236	0.0236	0.0236
	(0.27)	(0.53)	(0.43)
BE/ME	0.0032	0.0032	0.0032
	(0.25)	(0.48)	(0.25)
Industry BE /ME	0.0338	0.0338	0.0338
	(0.71)	(1.12)	(0.42)
ME	-0.0004	-0.0004	-0.0004
	(-0.10)	(-0.21)	(-0.14)
Beta	0.0201	0.0201 **	0.0201
	(0.96)	(2.09)	(0.57)
Breusch-Pagan LM test			
Hausman test			
Observations	145	145	145
Multicollinearity (vif)			
Heteroskedasticity (χ^2 - Stat)			
Serial Correlation (F- stat)			
R-Squared	0.0074	0.0074	0.0074
Adjused R-Squared	-0.0209	-0.0209	-0.0209

Test for the presence of fixed firm effect			
Fixed Effect Model - F test (p-value)	0.4140		
Test for the presence of time effect			
Time Dummies - F test (p-value)	0.0000		

Results of Panel Data Analysis - Mining

	Dependent Variables		
	Pooled OLS	OLS Firm Specific Effects	OLS Time Effects
Intercept	-0.0178	-0.0178	-0.0178
	(-0.09)	(-0.38)	(-0.08)
BE/ME	0.0026	0.0026	0.0026
	(0.11)	(0.32)	(0.20)
Industry BE /ME	0.0421	0.0421	0.0421
	(0.50)	(1.69)	(0.30)
ME	0.0029	0.0029	0.0029
	(0.39)	(1.22)	(1.10)
Beta	0.0244	0.0244	0.0244
	(1.54)	(4.85)	(0.78)
Breusch-Pagan LM test			
Hausman test			
Observations	145	145	145
Multicollinearity (vif)			
Heteroskedasticity (χ^2 - Stat)			
Serial Correlation (F- stat)			
R-Squared	0.0209	0.0209	0.0209
Adjused R-Squared	-0.0071	-0.0071	-0.0071

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.9459

Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

Results of Panel Data Analysis - Personal Goods

	Dependent Variables Pooled OLS		OLS Firm Specific Effects		OLS Time Effects
Intercept	0.1341		0.1341		0.1341
	(0.44)		(0.75)		(0.60)
BE/ME	0.0028		0.0028		0.0028
	(0.21)		(0.53)		(0.31)
Industry BE /ME	0.0384		0.0384	***	0.0384
	(1.09)		(2.79)		(0.73)
ME	-0.0039		-0.0039		-0.0039
	(-0.27)		(-0.43)		(-0.49)
Beta	0.0252		0.0252	***	0.0252
	(1.19)		(2.53)		(0.89)
Breusch-Pagan LM test					
Hausman test					
Observations	145		145		145
Multicollinearity (vif)					
Heteroskedasticity (χ^2 - Stat)					
Serial Correlation (F- stat)					
R-Squared	0.0109		0.0109		0.0109
Adjused R-Squared	-0.0174		-0.0174		-0.0174

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.5088

Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

Results of Panel Data Analysis - Pharmaceuticals & Biotechnology

	Dependent Variables		
	Pooled OLS	OLS Firm Specific Effects	OLS Time Effects
Intercept	0.6010	0.6010 **	0.6010
	(1.05)	(2.11)	(0.76)
BE/ME	0.0163	0.0163 ***	0.0163
	(0.95)	(2.55)	(0.98)
Industry BE /ME	-0.0141	-0.0141	-0.0141
	(-0.29)	(-0.50)	(-0.21)
ME	-0.0282	-0.0282 **	-0.0282
	(-1.02)	(-2.19)	(-0.77)
Beta	-0.0258	-0.0258	-0.0258
	(-0.65)	(-1.42)	(-0.64)
Breusch-Pagan LM test			
Hausman test			
Observations	145	145	145
Multicollinearity (vif)			
Heteroskedasticity (χ^2 - Stat)			
Serial Correlation (F- stat)			
R-Squared	0.0147	0.0147	0.0147
Adjused R-Squared	-0.0134	-0.0134	-0.0134
Test for the presence of fixed firm effect			
Fixed Effect Model - F test (p-value)	0.3416		
Test for the presence of time effect			
Time Dummies - F test (p-value)	0.0000		

Results of Panel Data Analysis - Real Estates & Investment Services

	Dependent Variables		
	Pooled OLS	OLS Firm Specific Effects	OLS Time Effects
Intercept	-0.0438	-0.0438	-0.0438
	(-0.15)	(-0.20)	(-0.40)
BE/ME	-0.0102	-0.0102	-0.0102
	(-0.49)	(-0.74)	(-1.37)
Industry BE /ME	0.0096	0.0096	0.0096
	(0.13)	(0.20)	(0.14)
ME	0.0022	0.0022	0.0022
	(0.17)	(0.23)	(0.77)
Beta	-0.0186	-0.0186	-0.0186
	(-0.62)	(-0.95)	(-1.02)
Breusch-Pagan LM test			
Hausman test			
Observations	145	145	145
Multicollinearity (vif)			
Heteroskedasticity (χ^2 - Stat)			
Serial Correlation (F- stat)			
R-Squared	0.0236	0.0236	0.0236
Adjused R-Squared	-0.0043	-0.0043	-0.0043

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.5822
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

Results of Panel Data Analysis - Software & Computer Services

	Dependent Variables		
	Pooled OLS	OLS Firm Specific Effects	OLS Time Effects
Intercept	0.0086	0.0086	0.0086
	(0.03)	(0.06)	(0.07)
BE/ME	-0.0142	-0.0142 **	-0.0142 *
	(-1.21)	(-1.81)	(-1.75)
Industry BE /ME	-0.0321	-0.0321	-0.0321
	(-0.69)	(-1.27)	(-0.48)
ME	-0.0026	-0.0026	-0.0026
	(-0.20)	(-0.35)	(-0.40)
Beta	0.0023	0.0023	0.0023
	(0.13)	(0.14)	(0.09)
Breusch-Pagan LM test			
Hausman test			
Observations	145	145	145
Multicollinearity (vif)			
Heteroskedasticity (χ^2 - Stat)			
Serial Correlation (F- stat)			
R-Squared	0.0242	0.0242	0.0242
Adjused R-Squared	-0.0036	-0.0036	-0.0036

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.5958

Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

Results of Panel Data Analysis - Technology Hardware & Equipment

	Dependent Variables					
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects	
Intercept	0.1512		0.1512		0.1512	
	(0.76)		(1.51)		(1.24)	
BE/ME	0.0143		0.0143	**	0.0143	
	(1.17)		(2.13)		(1.12)	
Industry BE /ME	0.0241		0.0241		0.0241	
	(0.70)		(1.08)		(0.43)	
ME	-0.0049		-0.0049		-0.0049	
	(-0.51)		(-1.02)		(-1.26)	
Beta	0.0527	***	0.0527	***	0.0527	*
	(2.46)		(3.55)		(1.87)	
Breusch-Pagan LM test						
Hausman test						
Observations	145		145		145	
Multicollinearity (vif)						
Heteroskedasticity (χ^2 - Stat)						
Serial Correlation (F- stat)						
R-Squared	0.0509		0.0509		0.0509	
Adjused R-Squared	0.0237		0.0237		0.0237	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.3797
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

Results of Panel Data Analysis - Travel & Leisure

	Dependent Variables				
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects
Intercept	0.1130		0.1130	***	0.1130
	(1.17)		(4.42)		(1.35)
BE/ME	0.0099		0.0099	***	0.0099
	(0.64)		(2.35)		(1.24)
Industry BE /ME	0.0917	*	0.0917	***	0.0917
	(1.74)		(4.52)		(1.12)
ME	-0.0003		-0.0003		-0.0003
	(-0.07)		(-0.17)		(-0.14)
Beta	0.0603	***	0.0603	***	0.0603
	(2.65)		(5.37)		(1.59)
Breusch-Pagan LM test					
Hausman test					
Observations	145		145		
Multicollinearity (vif)					
Heteroskedasticity (χ^2 - Stat)					
Serial Correlation (F- stat)					
R-Squared	0.0490		0.0490		0.0490
Adjused R-Squared	0.0218		0.0218		0.0218

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.9029
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

Table 12 Regression Results of Monthly Portfolio Returns on Portfolio BE /ME and Control Variables by Industry

Industry	BE /ME		Industry BE /ME		ME		Beta		Adjusted R-Squared	Standard Errors
Construction & Materials	-0.0460	**	-0.0503		-0.0132		-0.0727	**	0.0900	CL - T
	(-2.09)		(-0.85)		(-1.28)		(-2.48)			
Electronic & Electrical Equipment	0.0176		-0.0928		0.0056		-0.0250		-0.0120	CL - T
	(0.62)		(-1.18)		(0.35)		(-0.97)			
Financial Services	-0.0088		-0.1185		-0.0017		-0.0751	**	0.0238	White
	(-0.26)		(-1.16)		(-0.05)		(-2.57)			
Food Producers	-0.0185		-0.0394		-0.0058		0.0104		0.0191	CL - T
	(-1.29)		(-0.74)		(-0.78)		(0.51)			
General Retailers	0.0001		-0.1907		-0.0133	*	-0.0311	*	0.0315	CL - T
	(0.00)		(-1.53)		(-1.65)		(1.68)			
Household Goods & Home Construction	-0.0289	**	-0.0500	*	-0.0170	*	-0.0323		0.0111	CL - T
	(-2.05)		(-0.91)		(-1.65)		(-1.23)			
Leisure Goods	-0.0300	***	0.0029		-0.0147	**	-0.0005		0.0202	CL - T
	(-9.59)		(0.17)		(-2.18)		(-0.04)			
Media	-0.0227		-0.0541		-0.0194		0.0150		0.0348	CL - T
	(-1.34)		(-1.22)		(-1.05)		(0.77)			
Personal Goods	-0.0413	*	-1.2105	**	-0.0204	**	0.0514		0.0174	CL - T
	(-1.87)		(-2.79)		(-2.63)		(0.81)			
Pharmaceuticals & Biotechnology	-0.0004		-0.1229		0.0011		-0.0266		0.0129	CL - T
	(-0.03)		(-1.44)		(0.13)		(-0.91)			
Real Estates & Investment Services	-0.0238		0.1716		-0.0124		0.0439		0.0143	CL - T
	(-1.44)		(1.18)		(-1.13)		(0.91)			
Software & Computer Services	-0.0123		-0.0626	**	-0.0016		-0.0273		0.0546	CL - T
	(-0.98)		(-2.10)		(-0.17)		(-1.37)			
Technology Hardware & Equipment	-0.0140	**	-0.0862		-0.0050		-0.0248		0.0248	CL - T
	(-2.05)		(-1.13)		(-1.08)		(-0.99)			
Travel & Leisure	-0.0230	**	0.3689		-0.0130	**	0.0761		0.0111	CL - T
	(-2.46)		(1.72)		(-2.12)		(1.34)			

Results of Panel Data Analysis - Construction & Materials

	Dependent Variables				Yes			
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects		OLS Firm Specific & Time Effects	
Intercept	0.2923		0.2923	***	0.2923		0.1542	*
	(1.37)		(3.05)		(1.41)		(1.92)	
BE/ME	-0.0460	***	-0.0460	***	-0.0460	**	-0.0464	***
	(-2.99)		(-7.18)		(-2.09)		(-6.26)	
Industry BE /ME	-0.0503		-0.0503	*	-0.0503		0.0144	
	(-0.73)		(-1.84)		(-0.85)		(1.20)	
ME	-0.0132		-0.0132	***	-0.0132		-0.0118	**
	('-1.26)		(-2.81)		(-1.28)		(-2.19)	
Beta	-0.0727	***	-0.0727	***	-0.0727	**	-0.0622	***
	(-2.59)		(-5.55)		(-2.48)		(-3.43)	
Breusch-Pagan LM test								
Hausman test								
Observations	155		155		155		155	
Multicollinearity (vif)								
Heteroskedasticity (χ^2 - Stat)								
Serial Correlation (F- stat)								
R-Squared	0.1137		0.1137		0.1137		0.4511	
Adjused R-Squared	0.0900		0.0900		0.0900		0.4402	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.6295
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0002

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where

R^2 = sample R-square

p = Number of predictors

N = Total sample size.

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1-R2	0.5489
N-1	154
N-p-1	151
	0.5598

Results of Panel Data Analysis - Electronic & Electrical Equipment

			Yes	
	Dependent Variables			
	Pooled OLS	OLS Firm Specific Effects	OLS Time Effects	OLS Firm Specific & Time Effects
Intercept	-0.0545	-0.0545	-0.0545	-0.1660
	(-0.19)	(-0.46)	(-0.18)	(-0.92)
BE/ME	0.0176	0.0176	0.0176	0.0226
	(0.85)	(1.34)	(0.62)	(1.51)
Industry BE /ME	-0.0928	-0.0928	-0.0928	omitted
	(-1.14)	(-1.51)	(-1.18)	
ME	0.0056	0.0056	0.0056	0.0113
	(0.37)	(0.83)	(0.35)	(1.20)
Beta	-0.0250	-0.0250 ***	-0.0250	0.0176
	(-0.90)	(-2.41)	(-0.97)	(1.59)
Breusch-Pagan LM test				
Hausman test				
Observations	155	155	155	155
Multicollinearity (vif)				
Heteroskedasticity (χ^2 - Stat)				
Serial Correlation (F- stat)				
R-Squared	0.0142	0.0142	0.0142	0.4148
Adjused R-Squared	-0.0120	-0.0120	-0.0120	0.4032

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.5742
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.5852
N-1	154
N-p-1	151
	0.5968

Results of Panel Data Analysis - Financial Services

Yes

Yes

	Dependent Variables Pooled OLS		OLS Firm Specific Effects		OLS Time Effects	OLS Firm Specific & Time Effects	
Intercept	0.0963		0.0963		0.0963	-0.0745	
	(0.14)		(0.36)		(0.29)	(-0.27)	
BE/ME	-0.0088		-0.0088		-0.0088	-0.0095	
	(-0.26)		(-0.45)		(-0.48)	(-0.44)	
Industry BE /ME	-0.1185		-0.1185	**	-0.1185	0.0738	
	(-1.16)		(-2.13)		(-1.29)	(0.79)	
ME	-0.0017		-0.0017		-0.0017	-0.0025	
	(-0.05)		(-0.12)		(-0.11)	(-0.15)	
Beta	-0.0751	***	-0.0751	***	-0.0751	-0.0793	**
	(-2.57)		(-2.61)		(-1.00)	(-2.40)	
Breusch-Pagan LM test							
Hausman test							
Observations	155		155		155	155	
Multicollinearity (vif)							
Heteroskedasticity (χ^2 - Stat)							
Serial Correlation (F- stat)							
R-Squared	0.0492		0.0492		0.0492	0.2706	
Adjused R-Squared	0.0238		0.0238		0.0238	0.2561	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.6152

Test for the presence of time effect	
Time Dummies - F test (p-value)	0.1882

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where

R^2 = sample R-square

p = Number of predictors

N = Total sample size.

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1-R2	0.7294
N-1	154
N-p-1	151
	0.7439

Results of Panel Data Analysis - Food Producers

			Yes	
	Dependent Variables			
	Pooled OLS	OLS Firm Specific Effects	OLS Time Effects	OLS Firm Specific & Time Effects
Intercept	0.1321	01321	01321	0.2106
	(0.80)	(0.75)	(0.84)	(0.85)
BE/ME	-0.0185	-0.0185	-0.0185	-0.0105
	(-0.99)	(-1.62)	(-1.29)	(-0.62)
Industry BE /ME	-0.0394	-0.0394	-0.0394	omitted
	(-0.80)	(-1.24)	(-0.74)	
ME	-0.0058	-0.0058	-0.0058	-0.0027
	(-0.72)	(0.59)	(-0.78)	(-0.35)
Beta	0.0104	0.0104	0.0104	0.0241
	(0.48)	(0.75)	(0.51)	(1.14)
Breusch-Pagan LM test				
Hausman test				
Observations	155	155	155	155
Multicollinearity (vif)				
Heteroskedasticity (χ^2 - Stat)				
Serial Correlation (F- stat)				
R-Squared	0.0446	0.0446	0.0446	0.5666
Adjused R-Squared	0.0191	0.0191	0.0191	0.5580

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.3700
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.4334
N-1	154
N-p-1	151
	0.4420

Results of Panel Data Analysis - General Retailers

	Dependent Variables		Yes	
	Pooled OLS	OLS Firm Specific Effects	OLS Time Effects	OLS Firm Specific & Time Effects
Intercept	0.2447	0.2447 ***	0.2447 *	0.1717 **
	(1.30)	(3.03)	(1.68)	(2.46)
BE/ME	0.0001	0.0001	0.0001	0.0160 ***
	(0.00)	(0.01)	(0.00)	(3.46)
Industry BE /ME	-0.1907	-0.1907	-0.1907	omitted
	(-1.49)	(-1.06)	(-1.53)	
ME	-0.0133	-0.0133 ***	-0.0133 *	-0.0068 **
	(-1.49)	(-3.80)	(-1.65)	(-2.46)
Beta	-0.0311	-0.0311	-0.0311 *	-0.0099
	(-1.59)	(-1.61)	(1.68)	(-0.94)
Breusch-Pagan LM test				
Hausman test				
Observations	155	155	155	155
Multicollinearity (vif)				
Heteroskedasticity (χ^2 - Stat)				
Serial Correlation (F- stat)				
R-Squared	0.0567	0.0567	0.0567	0.5409
Adjused R-Squared	0.0315	0.0315	0.0315	0.5318

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.9274

Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.4591
N-1	154
N-p-1	151
	0.4682

Results of Panel Data Analysis - Household Goods & Home Construction

	Dependent Variables			Yes
	Pooled OLS	OLS Firm Specific Effects	OLS Time Effects	OLS Firm Specific & Time Effects
Intercept	0.3355	0.3355	0.3355 *	0.0670
	(1.54)	(1.17)	(1.68)	(0.66)
BE/ME	-0.0289 **	-0.0289 ***	-0.0289 ***	-0.0062
	(-2.10)	(-3.15)	(-2.05)	(-0.75)
Industry BE /ME	-0.0499	-0.0500 *	-0.0500	-0.0706
	(-1.18)	(-1.73)	(-0.91)	(-0.95)
ME	-0.0170	-0.0170	-0.0170 *	-0.0015
	(-1.53)	(-1.17)	(-1.65)	(-0.31)
Beta	-0.0323	-0.0323 **	-0.0323 **	0.0057
	(-1.51)	(-2.10)	(-1.23)	(0.35)
Breusch-Pagan LM test				
Hausman test				
Observations	155	155	155	155
Multicollinearity (vif)				
Heteroskedasticity (χ^2 - Stat)				
Serial Correlation (F- stat)				
R-Squared	0.0368	0.0368	0.0368	0.6645
Adjused R-Squared	0.0111	0.0111	0.0111	0.6578

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.4098
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.3355
N-1	154
N-p-1	151
	0.3422

Results of Panel Data Analysis - Leisure Goods

	Dependent Variables		Yes	
	Pooled OLS	OLS Firm Specific Effects	OLS Time Effects	OLS Firm Specific & Time Effects
Intercept	0.3037	0.3037 **	0.3037	0.3022 *
	(1.31)	(2.19)	(1.51)	(1.92)
BE/ME	-0.0300 ***	-0.0300 ***	-0.0300 *	-0.0300 **
	(-2.40)	(-9.59)	(-1.65)	(-2.08)
Industry BE /ME	0.0029	0.0029	0.0029	-0.0312
	(0.06)	(0.17)	(0.08)	(-0.58)
ME	-0.0147	-0.0147 **	-0.0147	-0.0149 *
	(-1.25)	(-2.18)	(-1.54)	(-1.85)
Beta	-0.0005	-0.0005	-0.0005	-0.0052
	(-0.02)	(-0.04)	(-0.02)	(-0.30)
Breusch-Pagan LM test				
Hausman test				
Observations	155	155	155	155
Multicollinearity (vif)				
Heteroskedasticity (χ^2 - Stat)				
Serial Correlation (F- stat)				
R-Squared	0.0456	0.0456	0.0456	0.4590
Adjused R-Squared	0.0202	0.0202	0.0202	0.4446

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.6629
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.541
N-1	154
N-p-1	150
	0.5554

Results of Panel Data Analysis - Media

	Dependent Variables						
					Yes		
	Pooled OLS	OLS Firm Specific Effects		OLS Time Effects		OLS Firm Specific & Time Effects	
Intercept	0.4481	0.4481	***	0.4481		0.5501	*
	(0.97)	(3.62)		(1.20)		(1.78)	
BE/ME	-0.0227	-0.0227	**	-0.0227		-0.0180	
	(-1.19)	(-1.97)		(-1.34)		(-1.51)	
Industry BE /ME	-0.0541	-0.0541	***	-0.0541		-0.4193	
	(-1.24)	(-2.87)		(-1.22)		(-1.17)	
ME	-0.0194	-0.0194	***	-0.0194		-0.0127	
	(-0.84)	(-2.85)		(-1.05)		(-0.90)	
Beta	0.0150	0.0150	***	0.0150		0.0178	***
	(1.32)	(2.82)		(0.77)		(4.42)	
Breusch-Pagan LM test							
Hausman test							
Observations	155	155		155		155	
Multicollinearity (vif)							
Heteroskedasticity (χ^2 - Stat)							
Serial Correlation (F- stat)							
R-Squared	0.0598	0.0598		0.0598		0.4329	
Adjused R-Squared	0.0348	0.0348		0.0348		0.4178	

Test for the presence of fixed firm effect

Fixed Effect Model - F test (p-value) 0.6627

Test for the presence of time effect

Time Dummies - F test (p-value) 0.0001

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.5671
N-1	154
N-p-1	150
	0.5822

Results of Panel Data Analysis - Personal Goods

			Yes	
	Dependent Variables			
	Pooled OLS	OLS Firm Specific Effects	OLS Time Effects	OLS Firm Specific & Time Effects
Intercept	0.7356	0.7356 ***	0.7356 ***	0.1068
	(1.43)	(2.55)	(2.79)	(1.06)
BE/ME	-0.0413	-0.0413 ***	-0.0413 *	'0.0113
	(-1.45)	(-2.82)	(-1.87)	(1.41)
Industry BE /ME	-1.2105	-1.2105 **	-1.2105 ***	omitted
	(-1.29)	(-2.17)	(-2.79)	
ME	-0.0204	-0.0204 ***	-0.0204 ***	0.0051
	(-1.40)	(-2.74)	(-2.63)	(0.89)
Beta	0.0514 *	0.0514 ***	0.0514	0.0944 ***
	(1.89)	(4.31)	(0.81)	(9.94)
Breusch-Pagan LM test				
Hausman test				
Observations	155	155	155	155
Multicollinearity (vif)				
Heteroskedasticity (χ^2 - Stat)				
Serial Correlation (F- stat)				
R-Squared	0.0429	0.0429	0.0429	0.3886
Adjused R-Squared	0.0174	0.0174	0.0174	0.3723

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.6771
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0006

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.6114
N-1	154
N-p-1	150
	0.6277

Results of Panel Data Analysis - Pharmaceuticals & Biotechnology

	Dependent Variables					
					Yes	
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects	OLS Firm Specific & Time Effects
Intercept	-0.0201		-0.0201		-0.0201	-0.0987
	(-0.10)		(-0.08)		(-0.13)	(-0.46)
BE/ME	-0.0004		-0.0004		-0.0004	0.0136
	(-0.03)		(-0.03)		(-0.03)	(0.84)
Industry BE /ME	-0.1229	**	-0.1229	**	-0.1229	omitted
	(-2.17)		(-2.30)		(-1.44)	
ME	0.0011		0.0011		0.0011	0.0074
	(0.10)		(0.08)		(0.13)	(0.62)
Beta	-0.0266		-0.0266		-0.0266	0.0124
	(-1.17)		(-1.26)		(-0.91)	(0.67)
Breusch-Pagan LM test						
Hausman test						
Observations	155		155		155	155
Multicollinearity (vif)						
Heteroskedasticity (χ^2 - Stat)						
Serial Correlation (F- stat)						
R-Squared	0.0386		0.0386		0.0386	0.5891
Adjused R-Squared	0.0129		0.0129		0.0129	0.5781

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.1302

Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where

R^2 = sample R-square

p = Number of predictors

N = Total sample size.

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1-R2	0.4109
N-1	154
N-p-1	150
	0.4219

Results of Panel Data Analysis - Real Estates & Investment Services

				Yes	
	Dependent Variables				
	Pooled OLS		OLS Firm Specific Effects	OLS Time Effects	OLS Firm Specific & Time Effects
Intercept	0.1854		0.1854	0.1854	0.3156
	(0.31)		(0.53)	(0.85)	(0.80)
BE/ME	-0.0238		-0.0238	-0.0238	-0.0198
	(-0.52)		(-1.06)	(-1.44)	(-0.68)
Industry BE /ME	0.1716		0.1716 ***	0.1716	omitted
	(1.30)		(3.50)	(1.18)	
ME	-0.0124		-0.0124	-0.0124	-0.0114
	(-0.45)		(-0.76)	(-1.13)	(-0.66)
Beta	0.0439	***	0.0439 **	0.0439	0.0694 ***
	(2.37)		(2.46)	(0.91)	(4.69)
Breusch-Pagan LM test					
Hausman test					
Observations	155		155	155	155
Multicollinearity (vif)					
Heteroskedasticity (χ^2 - Stat)					
Serial Correlation (F- stat)					
R-Squared	0.0399		0.0399	0.0399	0.3988
Adjused R-Squared	0.0143		0.0143	0.0143	0.0143

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.7016
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0003

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2
N-1
N-p-1

Results of Panel Data Analysis - Software & Computer Services

	Dependent Variables			
			Yes	
	Pooled OLS	OLS Firm Specific Effects	OLS Time Effects	OLS Firm Specific & Time Effects
Intercept	0.0108	0.0108	0.0108	-0.0122
	(0.05)	(0.05)	(0.06)	(-0.25)
BE/ME	-0.0122	-0.0123	-0.0123	-0.0047
	(-0.80)	(-0.84)	(-0.98)	(-1.06)
Industry BE /ME	-0.0626 ***	-0.0626 **	-0.0626 **	0.0247
	(-2.75)	(-3.71)	(-2.10)	(0.45)
ME	-0.0016	-0.0016	-0.0016	0.0031
	(-0.15)	(-0.14)	(-0.17)	(0.92)
Beta	-0.0273	-0.0273	-0.0273	-0.0061
	(-1.40)	(-1.70)	(-1.37)	(-0.83)
Breusch-Pagan LM test				
Hausman test				
Observations	155	155	155	155
Multicollinearity (vif)				
Heteroskedasticity (χ^2 - Stat)				
Serial Correlation (F- stat)				
R-Squared	0.0791	0.0791	0.0791	0.6136
Adjused R-Squared	0.0546	0.0546	0.0546	0.6033

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.3407

Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.3864
N-1	154
N-p-1	150
	0.3967

Results of Panel Data Analysis - Technology Hardware & Equipment

	Dependent Variables			Yes			
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects		OLS Firm Specific & Time Effects	
Intercept	0.1277		0.1277	***	0.1277		0.2347	***
	(1.11)		(7.35)		(1.42)		(4.29)	
BE/ME	-0.0140		-0.0140	***	-0.0140	**	-0.0124	***
	(-1.56)		(-10.47)		(-2.05)		(-10.66)	
Industry BE /ME	-0.0862	*	-0.0862	***	-0.0862		omitted	
	(-1.88)		(-6.47)		(-1.13)			
ME	-0.0050		-0.0050	***	-0.0050		-0.0074	***
	(-0.89)		(-5.21)		(-1.08)		(-5.49)	
Beta	-0.0248		-0.0248	***	-0.0248		0.0104	***
	(-1.52)		(-3.95)		(-0.99)		(2.47)	
Breusch-Pagan LM test								
Hausman test								
Observations	155		155		155		155	
Multicollinearity (vif)								
Heteroskedasticity (χ^2 - Stat)								
Serial Correlation (F- stat)								
R-Squared	0.0502		0.0502		0.0502		0.6930	
Adjused R-Squared	0.0248		0.0248		0.0248		0.6848	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.9380

Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.307
N-1	154
N-p-1	150
	0.3152

Results of Panel Data Analysis - Travel & Leisure

	Dependent Variables Pooled OLS	OLS Firm Specific Effects	Yes OLS Time Effects	OLS Firm Specific & Time Effects
Intercept	0.1901	0.1901 *	0.1901	0.1620 ***
	(1.26)	(1.69)	(1.50)	(2.34)
BE/ME	-0.0230 *	-0.0230 ***	-0.0230 **	-0.0144 ***
	(-1.87)	(-2.78)	(-2.46)	(-7.99)
Industry BE /ME	0.3689 *	0.3689 **	0.3689 *	omitted
	(1.92)	(2.03)	(1.72)	
ME	-0.0130	-0.0130 *	-0.0130 **	-.0060 **
	(-1.58)	(-1.86)	(-2.12)	(-2.24)
Beta	0.0761	0.0761	0.0761	0.0160
	(1.35)	(1.64)	(1.34)	(0.88)
Breusch-Pagan LM test				
Hausman test				
Observations	155	155	155	155
Multicollinearity (vif)				
Heteroskedasticity (χ^2 - Stat)				
Serial Correlation (F- stat)				
R-Squared	0.0368	0.0368	0.0368	0.6810
Adjused R-Squared	0.0111	0.0111	0.0111	0.6725

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.8287
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.319
N-1	154
N-p-1	150
	0.3275

Table 12 Regression Results of Monthly Portfolio Returns on Portfolio BE /ME and Control Variables by Industry

Industry	BE /ME		Industry BE /ME	ME		Beta		Adjusted R-Squared	Standard Errors
Automobiles & Parts	-0.0040		0.1921	0.0032		0.0255		0.0079	CL - T
	(-0.42)		(0.39)	(1.13)		(1.12)			
Chemicals	0.0061		0.1846	0.0008		0.0332	*	0.0934	CL - T
	(0.65)		(0.50)	(0.65)		(1.80)			
Construction & Materials	-0.0086		0.0904	-0.0008		0.0439	*	0.0895	CL - T
	(-1.23)		(0.41)	(-0.28)		(1.87)			
Electronic & Electrical Equipment	-0.0011		0.1406	0.0027	*	0.0449	**	0.1180	CL - T
	(-0.19)		(0.91)	(1.80)		(2.31)			
Industrial Engineering	-0.0043		0.1529	-0.0021		0.0332		0.0477	CL - T
	(-0.42)		(0.46)	(-0.56)		(1.61)			
Industry Metal & Mining	0.0016		0.1107	-0.0031	*	0.0340	*	0.0996	CL - T
	(0.16)		(0.47)	(-1.70)		(1.95)			
Leisure Goods	-0.0024		0.1444	0.0021		0.0376	*	0.0996	CL - T
	(-0.41)		(0.82)	(0.38)		(1.71)			
Personal Goods	0.0033		0.1275	-0.0026		0.0328		(0.1766)	CL - T
	(0.38)		(0.75)	(-1.03)		(1.06)			
Real Estates & Investment Services	-0.0168	****	omitted	-0.0060		-0.0135	**	0.8232	CL - F&T
	(-3.43)			(-1.41)		(-2.39)			
Software & Computer Services	-0.0007		0.5349	0.0074		0.0505	**	(0.0437)	CL - T
	(-0.05)		(1.13)	(1.36)		(2.07)			
Technology Hardware & Equipment	0.0094		0.1423	-0.0003		0.0380	**	(0.0887)	CL - T
	(1.44)		(0.74)	(-0.41)		(2.15)			

Results of Panel Data Analysis - Automobile & Parts

	Dependent Variables			
			Yes	
	Pooled OLS	OLS Firm Specific Effects	OLS Time Effects	OLS Firm Specific & Time Effects
Intercept	-0.0112	-0.0112	-0.0112	0.0211
	(-0.11)	(-0.16)	(-0.10)	(0.42)
BE/ME	-0.0040	-0.0040	-0.0040	-0.0067
	(-0.22)	(-0.33)	(-0.42)	(-0.94)
Industry BE /ME	0.1921	0.1921 *	0.1921	omitted
	(0.67)	(1.77)	(0.39)	
ME	0.0032	0.0032	0.0032	0.0003
	(0.65)	(0.87)	(1.13)	(0.16)
Beta	0.0255 *	0.0255 ***	0.0255	0.0028
	(1.88)	(3.61)	(1.12)	(0.29)
Breusch-Pagan LM test				
Hausman test				
Observations	145	145	145	145
Multicollinearity (vif)				
Heteroskedasticity (χ^2 - Stat)				
Serial Correlation (F- stat)				
R-Squared	0.0355	0.0355	0.0355	0.7657
Adjused R-Squared	0.0079	0.0079	0.0079	0.7590

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.7971
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where

R^2 = sample R-square

p = Number of predictors

N = Total sample size.

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1-R2	0.2343
N-1	144
N-p-1	140
	0.2410

Results of Panel Data Analysis - Chemicals

	Dependent Variables						
					Yes		
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects		OLS Firm Specific & Time Effects
Intercept	0.0312		0.0312		0.0312		0.1426
	(0.32)		(1.57)		(0.27)		(1.57)
BE/ME	0.0061		0.0061		0.0061		0.0031
	(0.27)		(1.01)		(0.65)		(0.89)
Industry BE /ME	0.1846		0.1846	***	0.1846		omitted
	(1.00)		(2.88)		(0.50)		
ME	0.0008		0.0008		0.0008		-0.0003
	(0.20)		(0.59)		(0.65)		(-0.78)
Beta	0.0332	***	0.0332	***	0.0332	*	0.0044
	(3.78)		(10.79)		(1.80)		(0.73)
Breusch-Pagan LM test							
Hausman test							
Observations	145		145		145		145
Multicollinearity (vif)							
Heteroskedasticity (χ^2 - Stat)							
Serial Correlation (F- stat)							
R-Squared	0.1186		0.1186		0.1186		0.9113
Adjused R-Squared	0.0934		0.0934		0.0934		0.9088

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.9889
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.0887
N-1	144
N-p-1	140
	0.0912

Results of Panel Data Analysis - Construction & Materials

	Dependent Variables				Yes		
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects		OLS Firm Specific & Time Effects
Intercept	0.0218		0.0218		0.0218		0.0353
	(0.21)		(0.89)		(0.31)		(1.17)
BE/ME	-0.0086		-0.0086	***	-0.0086		-0.0041
	(-0.67)		(-3.95)		(-1.23)		(-1.25)
Industry BE /ME	0.0904		0.0904		0.0904		omitted
	(0.75)		(1.38)		(0.41)		
ME	-0.0008		-0.0008		-0.0008		0.0014
	(-0.16)		(-0.91)		(-0.28)		(0.87)
Beta	0.0439	***	0.0439	***	0.0439	*	0.0152
	(4.11)		(13.69)		(1.87)		(0.85)
Breusch-Pagan LM test							
Hausman test							
Observations	145		145		145		145
Multicollinearity (vif)							
Heteroskedasticity (χ^2 - Stat)							
Serial Correlation (F- stat)							
R-Squared	0.1148		0.1148		0.1148		0.8853
Adjused R-Squared	0.0895		0.0895		0.0895		0.8820

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.9850
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.1147
N-1	144
N-p-1	140
	0.1180

Results of Panel Data Analysis - Electronic & Electrical Equipment

	Dependent Variables				Yes			
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects		OLS Firm Specific & Time Effects	
Intercept	-0.0360		-0.0360		-0.0360		0.1447	***
	(-0.38)		(-1.29)		(-0.71)		(4.88)	
BE/ME	-0.0011		-0.0011		-0.0011		0.0016	
	(-0.07)		(-0.38)		(-0.19)		(0.42)	
Industry BE /ME	0.1406	*	0.1406	***	0.1406		omitted	
	(1.83)		(18.88)		(0.91)			
ME	0.0027		0.0027	**	0.0027	*	0.0026	***
	(0.54)		(2.00)		(1.80)		(2.67)	
Beta	0.0449	***	0.0449	***	0.0449	***	0.0128	
	(4.59)		(17.25)		(2.31)		(1.44)	
Breusch-Pagan LM test								
Hausman test								
Observations	145		145		145		145	
Multicollinearity (vif)								
Heteroskedasticity (χ^2 - Stat)								
Serial Correlation (F- stat)								
R-Squared	0.1425		0.1425		0.1425		0.9412	
Adjused R-Squared	0.1180		0.1180		0.1180		0.9395	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.9728
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.0588
N-1	144
N-p-1	140
	0.0605

Results of Panel Data Analysis - Industrial Engineering

					Yes		
	Dependent Variables						
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects	OLS Firm Specific & Time Effects	
Intercept	0.0623		0.0623		0.0623	0.1476	*
	(0.42)		(0.72)		(0.60)	(1.67)	
BE/ME	-0.0043		-0.0043		-0.0043	0.0013	
	(-0.19)		(-0.55)		(-0.42)	(0.12)	
Industry BE /ME	0.1529		0.1529	***	0.1529	omitted	
	(0.90)		(3.67)		(0.46)		
ME	-0.0021		-0.0021		-0.0021	0.0000	
	(-0.25)		(-0.40)		(-0.56)	(0.00)	
Beta	0.0332	***	0.0332	***	0.0332	0.0007	
	(3.25)		(5.08)		(1.61)	(0.04)	
Breusch-Pagan LM test							
Hausman test							
Observations	145		145		145	145	
Multicollinearity (vif)							
Heteroskedasticity (χ^2 - Stat)							
Serial Correlation (F- stat)							
R-Squared	0.0742		0.0742		0.0742	0.8652	
Adjused R-Squared	0.0477		0.0477		0.0477	0.8613	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.9502
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.

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1-R2	0.1348
N-1	144
N-p-1	140
	0.1387

Results of Panel Data Analysis - Industry Metal & Mining

	Dependent Variables			Yes	
	Pooled OLS	OLS Firm Specific Effects	OLS Time Effects	OLS Firm Specific & Time Effects
Intercept	0.0636 (0.91)	0.0636 *** (7.66)	0.0636 (1.21)	0.1686 *** (6.21)
BE/ME	0.0016 (0.07)	0.0016 (0.47)	0.0016 (0.16)	0.0014 (0.30)
Industry BE /ME	0.1107 (0.99)	0.1107 *** (4.86)	0.1107 (0.47)	omitted
ME	-0.0031 (-0.91)	-0.0031 *** (-5.77)	-0.0031 * (-1.70)	-0.0028 ** (-2.30)
Beta	0.0340 *** (4.19)	0.0340 *** (11.30)	0.0340 * (1.95)	0.0294 ** (2.45)
Breusch-Pagan LM test				
Hausman test				
Observations	145	145	145	145
Multicollinearity (vif)				
Heteroskedasticity (χ^2 - Stat)				
Serial Correlation (F- stat)				
R-Squared	0.1246	0.1246	0.1246	0.8783
Adjused R-Squared	0.0996	0.0996	0.0996	0.8748

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.9948
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.1217
N-1	144
N-p-1	140
	0.1252

Results of Panel Data Analysis -Leisure Goods

	Dependent Variables				Yes			
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects		OLS Firm Specific & Time Effects	
Intercept	0.0079		0.0079		0.0079		0.0717	
	(0.04)		(0.40)		(0.06)		(1.10)	
BE/ME	-0.0024		-0.0024		-0.0024		0.0000	
	(-0.21)		(-0.58)		(-0.41)		(0.01)	
Industry BE /ME	0.1444		0.1444	***	0.1444		omitted	
	(1.50)		(3.99)		(0.82)			
ME	0.0021		0.0021		0.0021		0.0034	
	(0.22)		(1.32)		(0.38)		(1.41)	
Beta	0.0376	***	0.0376	***	0.0376	*	0.0232	*
	(3.09)		(6.29)		(1.71)		(1.93)	
Breusch-Pagan LM test								
Hausman test								
Observations	145		145		145		145	
Multicollinearity (vif)								
Heteroskedasticity (χ^2 - Stat)								
Serial Correlation (F- stat)								
R-Squared	0.0829		0.0829		0.0829		0.8308	
Adjused R-Squared	0.0567		0.0996		0.0996		0.8260	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.9061
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where

R^2 = sample R-square

p = Number of predictors

N = Total sample size.

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1-R2	0.1692
N-1	144
N-p-1	140
	0.1740

Results of Panel Data Analysis - Personal Goods

	Dependent Variables		Yes	
	Pooled OLS	OLS Firm Specific Effects	OLS Time Effects	OLS Firm Specific & Time Effects
Intercept	0.0545	0.0545	0.0545	0.1650 ***
	(0.62)	(1.39)	(0.93)	(3.91)
BE/ME	0.0033	0.0033	0.0033	0.0027
	(0.23)	(0.66)	(0.38)	(0.73)
Industry BE /ME	0.1275	0.1275 ***	0.1275	omitted
	(1.40)	(4.71)	(0.75)	
ME	-0.0026	-0.0026	-0.0026	-0.0038 **
	(-0.57)	(-1.24)	(-1.03)	(-2.05)
Beta	0.0328 *	0.0328 ***	0.0328	0.0055
	(1.88)	(5.80)	(1.06)	(0.60)
Breusch-Pagan LM test				
Hausman test				
Observations	145	145	145	145
Multicollinearity (vif)				
Heteroskedasticity (χ^2 - Stat)				
Serial Correlation (F- stat)				
R-Squared	0.1995	0.1995	0.1995	0.8619
Adjused R-Squared	(0.1766)	(0.1766)	(0.1766)	0.8580

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.9249
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where

R^2 = sample R-square

p = Number of predictors

N = Total sample size.

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1-R2	0.1381
N-1	144
N-p-1	140
	0.1420

Results of Panel Data Analysis - Real Estates & Investment Services

	Dependent Variables			
				Yes
	Pooled OLS	OLS Firm Specific Effects	OLS Time Effects	OLS Firm Specific & Time Effects
Intercept	0.0645	0.0645	0.0645	0.2054 ***
	(0.31)	(0.30)	(0.56)	(3.21)
BE/ME	-0.0050	-0.0050	-0.0050	-0.0168 ***
	(-0.27)	(-0.58)	(-0.42)	(-3.43)
Industry BE /ME	0.1241	0.1241	0.1241	omitted
	(0.63)	(0.75)	(0.31)	
ME	-0.0018	-0.0018	-0.0018	-0.0060
	(-0.16)	(-0.18)	(-0.37)	(-1.41)
Beta	0.0532 ***	0.0532 ***	0.0532 *	-0.0135 **
	(2.71)	(4.35)	(1.68)	(-2.39)
Breusch-Pagan LM test				
Hausman test				
Observations	145	145	145	145
Multicollinearity (vif)				
Heteroskedasticity (χ^2 - Stat)				
Serial Correlation (F- stat)				
R-Squared	0.0750	0.0750	0.0750	0.8281
Adjused R-Squared	(0.0486)	(0.0486)	(0.0486)	0.8232

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.0338

Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where

R^2 = sample R-square

p = Number of predictors

N = Total sample size.

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1-R2	0.1719
N-1	144
N-p-1	140

0.1768

Results of Panel Data Analysis - Software & Computer Services

			Yes	
	Dependent Variables			
	Pooled OLS	OLS Firm Specific Effects	OLS Time Effects	OLS Firm Specific & Time Effects
Intercept	-0.0315	-0.0315	-0.0315	0.0389
	(-0.19)	(-1.10)	(-0.35)	(0.30)
BE/ME	-0.0007	-0.0007	-0.0007	0.0006
	(-0.04)	(-0.14)	(-0.05)	(0.16)
Industry BE /ME	0.5349	0.5349 ***	0.5349	omitted
	(1.03)	(3.45)	(1.13)	
ME	0.0074	0.0074 **	0.0074	0.0069
	(0.69)	(2.24)	(1.36)	(1.48)
Beta	0.0505 *	0.0505 ***	0.0505 **	0.0472 ***
	(1.93)	(4.35)	(2.07)	(2.80)
Breusch-Pagan LM test				
Hausman test				
Observations	145	145	145	145
Multicollinearity (vif)				
Heteroskedasticity (χ^2 - Stat)				
Serial Correlation (F- stat)				
R-Squared	0.0703	0.0703	0.0703	0.7148
Adjused R-Squared	(0.0437)	(0.0437)	(0.0437)	0.7067

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.8817
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.2852
N-1	144
N-p-1	140
	0.2933
	0.2933

Results of Panel Data Analysis - Technology Hardware & Equipment

	Dependent Variables		Yes	
	Pooled OLS	OLS Firm Specific Effects	OLS Time Effects	OLS Firm Specific & Time Effects
Intercept	0.0508	0.0508	0.0508	0.2441 ***
	(0.73)	(1.27)	(0.65)	(11.07)
BE/ME	0.0094	0.0094	0.0094	0.0039
	(0.74)	(1.46)	(1.44)	(1.50)
Industry BE /ME	0.1423 *	0.1423 ***	0.1423	omitted
	(1.67)	(4.23)	(0.74)	
ME	-0.0003	-0.0003	-0.0003	-0.0002
	(-0.12)	(-0.18)	(-0.41)	(-0.21)
Beta	0.0380 ***	0.0380 ***	0.0380 **	-0.0333 ***
	(4.04)	(11.15)	(2.15)	(-2.93)
Breusch-Pagan LM test				
Hausman test				
Observations	145	145	145	145
Multicollinearity (vif)				
Heteroskedasticity (χ^2 - Stat)				
Serial Correlation (F- stat)				
R-Squared	0.1140	0.1140	0.1140	0.8977
Adjused R-Squared	(0.0887)	(0.0887)	(0.0887)	0.8948

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.9572
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.1023
N-1	144
N-p-1	140

0.1052

Results of Panel Data Analysis - 3 Factor Model
Global Financial Crisis - China

			Yes	
	Dependent Variables			
	Pooled OLS	OLS Firm Specific Effects	OLS Time Effects	OLS Firm Specific & Time
Intercept	0.0206	0.0206 ***	0.0206	-0.1220 ***
	(1.37)	(6.15)	(0.32)	(-19.70)
MRP	-0.9311 ***	-0.9311 ***	-0.9311	omitted
	(-3.04)	(-14.36)	(-0.61)	
SMB	-2.0574 ***	-2.0574 ***	-2.0574 *	omitted
	(-11.69)	(-18.21)	(-1.90)	
HML	-0.0450	-0.0450	-0.0450	omitted
	(-0.36)	(-0.98)	(-0.06)	
Breusch-Pagan LM test				
Hausman test				
Observations	900	900	900	900
Multicollinearity (vif)				
Heteroskedasticity (χ^2 - Stat)				
Serial Correlation (F- stat)				
R-Squared	0.1436	0.1436	0.1436	0.9541
Adjused R-Squared	0.1408	0.1408	0.1408	0.9539

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	1.0000
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.0459
N-1	899
N-p-1	896
	0.046054

Results of Panel Data Analysis - 3 Factor Model
Global Financial Crisis - Hong Kong

							Yes	
	Dependent Variables							
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects		OLS Firm Specific & Time	
Intercept	0.0816	***	0.0816	***	0.0816		-0.1832	***
	(3.97)		(4.74)		(1.12)		(-13.91)	
MRP	-1.3815	***	-1.3815	***	-1.3815		omitted	
	(-4.03)		(-7.01)		(-1.06)		(collinearity)	
SMB	0.0084	***	0.0084	***	0.0084	**	0.0028	**
	(4.20)		(9.55)		(2.20)		(1.97)	
HML	0.0155	*	0.0155	**	0.0155		-0.0829	***
	(1.74)		(2.24)		(1.32)		(-9.39)	
Breusch-Pagan LM test								
Hausman test								
Observations	900		900		900		900	
Multicollinearity (vif)								
Heteroskedasticity (χ^2 - Stat)								
Serial Correlation (F- stat)								
R-Squared	0.0572		0.0572		0.0572		0.5757	
Adjused R-Squared	0.0541		0.0541		0.0541		0.5743	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.0081
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.4243
N-1	899
N-p-1	896
	0.4257

Results of Panel Data Analysis - 3Factor
Global Financial Crisis - Taiwan

	Dependent Variables				Yes			
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects		OLS Firm Specific & Time	
Intercept	0.3296	***	0.3296	***	0.3296	***	-0.1528	***
	(6.44)		(16.31)		(2.85)		(-16.73)	
MRP	-5.1699	***	-5.1699	***	-5.1699	***	omitted	
	(-6.44)		(-25.06)		(-2.84)			
SMB	-0.5070	***	-0.5070	***	-0.5070		omitted	
	(-2.81)		(-3.36)		(-1.24)			
HML	-0.6095	***	-0.6095	***	-0.6095	***	omitted	
	(-5.47)		(-2.89)		(-2.67)			
Breusch-Pagan LM test								
Hausman test								
Observations	900		900		900		900	
Multicollinearity (vif)								
Heteroskedasticity (χ^2 - Stat)								
Serial Correlation (F- stat)								
R-Squared	0.0822		0.0822		0.0822		0.2803	
Adjused R-Squared	0.0792		0.0792		0.0792		0.2787	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.3068

Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.7197
N-1	899
N-p-1	897
	0.721305

Results of Panel Data Analysis - 3 Factor Model
Euro Zone Crisis - China

	Dependent Variables		Yes	
	Pooled OLS	OLS Firm Specific Effects	OLS Time Effects	OLS Firm Specific & Time
Intercept	-4.9641 ***	-4.9641 ***	-4.9641 ***	-4.1424 ***
	(-83.31)	(-189.97)	(-23.85)	(-166.95)
MRP	19.1574 ***	19.1574 ***	19.1574 ***	omitted
	(20.32)	(36.52)	(6.42)	
SMB	0.3156	0.3156	0.3156	omitted
	(1.23)	(1.41)	(0.84)	
HML	-0.2488	-0.2488	-0.2488	omitted
	(-0.53)	(-0.93)	(-0.10)	
Breusch-Pagan LM test				
Hausman test				
Observations	775	775	775	775
Multicollinearity (vif)				
Heteroskedasticity (χ^2 - Stat)				
Serial Correlation (F- stat)				
R-Squared	0.3581	0.3581	0.3581	0.8704
Adjused R-Squared	0.3556	0.3556	0.3556	0.8699

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	1.0000
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.1296
N-1	774
N-p-1	771
	0.130104

Results of Panel Data Analysis - 3 Factor Model
Euro Zone Crisis - Hong Kong

	Dependent Variables				Yes		
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects	OLS Firm Specific & Time	
Intercept	0.0808	***	0.0808	***	0.0808	0.0456	**
	(3.86)		(3.47)		(1.55)	(2.09)	
MRP	-1.3567	***	-1.3567	***	-1.3567	omitted	
	(-4.02)		(-4.17)		(-1.47)		
SMB	0.1290	*	0.1290		0.1290	omitted	
	(1.84)		(1.46)		(0.54)		
HML	-0.1879	**	-0.1879		-0.1879	omitted	
	(-2.24)		(-1.59)		(-0.94)		
Breusch-Pagan LM test							
Hausman test							
Observations	775		775		775	775	
Multicollinearity (vif)							
Heteroskedasticity (χ^2 - Stat)							
Serial Correlation (F- stat)							
R-Squared	0.0301		0.0301		0.0301	0.2979	
Adjused R-Squared	0.0263		0.0263		0.0263	0.2952	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.1881
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.7021
N-1	774
N-p-1	771
	0.7048

Results of Panel Data Analysis - 3 Factor Model
Euro Zone Crisis - Taiwan

Yes

	Dependent Variables Pooled OLS		OLS Firm Specific Effects		OLS Time Effects		OLS Firm Specific & Time	
Intercept	0.3221	***	0.3221	***	0.3221	***	0.1540	***
	(11.04)		(25.67)		(25.67)		(18.27)	
MRP	-4.7456	***	-4.7456	***	-4.7456	***	omitted	
	(-11.15)		(-26.14)		(-26.14)			
SMB	-0.6738	***	-0.6738	***	-0.6738	***	omitted	
	(-6.03)		(-16.12)		(-16.12)			
HML	-0.1405		-0.1405		-0.1405		omitted	
	(-1.60)		(-1.40)		(-1.40)			
Breusch-Pagan LM test								
Hausman test								
Observations	775		775		775		775	
Multicollinearity (vif)								
Heteroskedasticity (χ^2 - Stat)								
Serial Correlation (F- stat)								
R-Squared	0.1877		0.1877		0.1877		0.8677	
Adjused R-Squared	0.1846		0.1846		0.1846		0.8672	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	1.0000
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{\text{adjusted}} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.1323
N-1	774
N-p-1	771
	0.1328

Results of Panel Data Analysis - 3 Factor Model
Global Financial Crisis - China - Small Market Capitalisation

	Dependent Variables				Yes			
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects		OLS Firm Specific & Time	
Intercept	0.0522	*	0.0522	***	0.0522		-0.052	***
	(1.70)		(5.25)		(0.80)		(-4.81)	
MRP	-0.4123		-0.4123	**	-0.4123		omitted	
	(-0.67)		(-2.13)		(-0.28)			
SMB	-1.1222	***	-1.1222	***	-1.1222	***	omitted	
	(-6.05)		(-4.83)		(-2.71)			
HML	0.4098	***	0.4098	***	0.4098	***	omitted	
	(4.49)		(2.54)		(3.44)			
Breusch-Pagan LM test								
Hausman test								
Observations	180		180		180		180	
Multicollinearity (vif)								
Heteroskedasticity (χ^2 - Stat)								
Serial Correlation (F- stat)								
R-Squared	0.1959		0.1959		0.1959		0.8988	
Adjused R-Squared	0.1822		0.1822		0.1822		0.8971	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.9551
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.1012
N-1	179
N-p-1	176
	0.102925

Results of Panel Data Analysis - 3 Factor Model
Global Financial Crisis - HK - Small Market Capitalisation

	Dependent Variables			
			Yes	
	Pooled OLS	OLS Firm Specific Effects	OLS Time Effects	OLS Firm Specific & Time
Intercept	0.1585 ***	0.1585 ***	0.1585 ***	-0.1100 ***
	(4.42)	(6.89)	(2.95)	(-5.35)
MRP	-2.1702 ***	-2.1702 ***	-2.1702 **	omitted
	(-3.66)	(-7.30)	(-2.05)	
SMB	0.0627	0.0627	0.0627	omitted
	(0.54)	(0.33)	(0.19)	
HML	-0.1277	-0.1277 **	-0.1277	omitted
	(-1.15)	(-2.11)	(-0.51)	
Breusch-Pagan LM test				
Hausman test				
Observations	180	180	180	180
Multicollinearity (vif)				
Heteroskedasticity (χ^2 - Stat)				
Serial Correlation (F- stat)				
R-Squared	0.1077	0.1077	0.1077	0.7885
Adjused R-Squared	0.0925	0.0925	0.0925	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.1531
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.2115
N-1	179
N-p-1	176

Results of Panel Data Analysis - 3 Factor Model
Global Financial Crisis - TW - Small Market Capitalisation

	Dependent Variables						Yes	
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects		OLS Firm Specific & Time	
Intercept	0.0248		0.0248		0.0248		-0.0886	***
	(0.82)		(0.78)		(1.23)		(-3.85)	
MRP	-0.0531		-0.0531		-0.0531		0.4695	
	(-0.10)		(-0.09)		(-0.14)		(1.31)	
SMB	-0.5969	***	-0.5969	***	-0.5969	***	-1.6075	***
	(-3.50)		(-3.29)		(-3.03)		(-6.97)	
HML	-0.7967	***	-0.7967	***	-0.7967	***	-1.8956	***
	(-4.60)		(-10.22)		(-4.09)		(-12.26)	
Breusch-Pagan LM test								
Hausman test								
Observations	180		180		180		180	
Multicollinearity (vif)								
Heteroskedasticity (χ^2 - Stat)								
Serial Correlation (F- stat)								
R-Squared	0.1942		0.1942		0.1942		0.4221	
Adjused R-Squared	0.1805		0.1805		0.1805		0.4122	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.0082
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0171

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.5779
N-1	179
N-p-1	176

0.587751

Results of Panel Data Analysis - 3 Factor Model

Global Financial Crisis - China - Big Market Capitalisation   Yes

	Dependent Variables					
	Pooled OLS	OLS Firm Specific Effects		OLS Time Effects	OLS Firm Specific & Time	
Intercept	0.0288	0.0288	***	0.0288	-0.0580	***
	(0.86)	(11.87)		(0.39)	(-4.40)	
MRP	-0.3393	-0.3393	***	-0.3393	omitted	
	(-0.59)	(-9.25)		(-0.25)		
SMB	0.3005	0.3005		0.3005	omitted	
	(1.06)	(1.80)		(0.50)		
HML	0.0560	0.0560	***	0.0560	omitted	
	(0.20)	(2.64)		(0.09)		
Breusch-Pagan LM test						
Hausman test						
Observations	180	180		180	180	
Multicollinearity (vif)						
Heteroskedasticity (χ^2 - Stat)						
Serial Correlation (F- stat)						
R-Squared	0.0136	0.0136		0.0136	0.9755	
Adjused R-Squared	-0.0033	-0.0033		-0.0033	0.9751	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.9863
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where

R^2 = sample R-square

p = Number of predictors

N = Total sample size.

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1-R2	0.0245
N-1	179
N-p-1	176
	0.024918

Results of Panel Data Analysis - 3 Factor Model
Global Financial Crisis - HK - Big Market Capitalisation

	Dependent Variables				Yes		
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects	OLS Firm Specific & Time	
Intercept	0.1199	***	0.1199	***	0.1199	-0.1960	***
	(3.12)		(14.59)		(1.57)	(-25.92)	
MRP	-1.5470	***	-1.5470	***	-1.5470	omitted	
	(-2.36)		(-16.12)		(-1.09)		
SMB	-0.0937		-0.0937		-0.0937	omitted	
	(-1.16)		(-0.49)		(-0.46)		
HML	0.3810	***	0.3810	***	0.3810	omitted	
	(2.52)		(4.16)		(0.91)		
Breusch-Pagan LM test							
Hausman test							
Observations	180		180		180	180	
Multicollinearity (vif)							
Heteroskedasticity (χ^2 - Stat)							
Serial Correlation (F- stat)							
R-Squared	0.0635		0.0635		0.0635	0.8376	
Adjused R-Squared	0.0476		0.0476		0.0476	0.8348	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.9866
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.1624
N-1	179
N-p-1	176
	0.1652

Results of Panel Data Analysis - 3 Factor Model
Global Financial Crisis - TW - Big Market Capitalisation

	Dependent Variables				Yes			
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects		OLS Firm Specific & Time	
Intercept	0.0257		0.0257	*	0.0257		-0.1399	***
	(1.50)		(1.82)		(1.36)		(-8.50)	
MRP	-0.2251		-0.2251		-0.2251		-0.0031	
	(-0.77)		(-1.06)		(-0.93)		(-0.17)	
SMB	1.1942	***	1.1942	***	1.1942	***	omitted	
	(7.43)		(7.19)		(3.95)			
HML	-0.5016	***	-0.5016	***	-0.5016		omitted	
	(-2.47)		(-12.83)		(-1.17)			
Breusch-Pagan LM test								
Hausman test								
Observations	180		180		180		180	
Multicollinearity (vif)								
Heteroskedasticity (χ^2 - Stat)								
Serial Correlation (F- stat)								
R-Squared	0.2528		0.2528		0.2528		0.9677	
Adjused R-Squared	0.2401		0.2401		0.2401		0.9668	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.1492
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.0323
N-1	179
N-p-1	174
	0.03

Results of Panel Data Analysis - 3 Factor Model

Euro Zone Crisis - China - Small Market Capitalisation

Yes

	Dependent Variables Pooled OLS		OLS Firm Specific Effects		OLS Time Effects		OLS Firm Specific & Time	
Intercept	0.0270		0.0270	***	0.0270		0.0420	***
	(1.42)		(16.95)		(0.99)		(10.07)	
MRP	-0.0215		-0.0215		-0.0215		omitted	
	(-0.07)		(-0.68)		(-0.24)			
SMB	-1.2170	***	-1.2170	***	-1.2170	***	omitted	
	(-6.77)		(-6.93)		(-2.64)			
HML	-0.3953	***	-0.3953	***	-0.3953		omitted	
	(-2.84)		(-17.50)		(-1.00)			
Breusch-Pagan LM test								
Hausman test								
Observations	145		145		145		145	
Multicollinearity (vif)								
Heteroskedasticity (χ^2 - Stat)								
Serial Correlation (F- stat)								
R-Squared	0.3575		0.3575		0.3575		0.9644	
Adjused R-Squared	0.3438		0.3438		0.3438		0.9636	

Test for the presence of fixed firm effect

Fixed Effect Model - F test (p-value) 0.9644

Test for the presence of time effect

Time Dummies - F test (p-value) 0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where

R^2 = sample R-square

p = Number of predictors

N = Total sample size.

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1-R2	0.0356
N-1	144
N-p-1	141
	0.04

Results of Panel Data Analysis - 3 Factor Model
Euro Zone Crisis - HK - Small Market Capitalisation

	Dependent Variables Pooled OLS		OLS Firm Specific Effects		OLS Time Effects		OLS Firm Specific & Time	
Intercept	0.1128	***	0.1128	***	0.1128	**	0.0960	*
	(2.91)		(12.75)		(2.19)		(1.75)	
MRP	-1.7355	***	-1.7355	***	-1.7355	**	omitted	
	(-2.93)		(-12.06)		(-2.10)			
SMB	0.1430	***	0.1430		0.1430		omitted	
	(2.78)		(0.74)		(1.44)			
HML	-0.3291	***	-0.3291	***	-0.3291	**	omitted	
	(-2.86)		(-3.07)		(-2.27)			
Breusch-Pagan LM test								
Hausman test								
Observations	155		155		155		155	
Multicollinearity (vif)								
Heteroskedasticity (χ^2 - Stat)								
Serial Correlation (F- stat)								
R-Squared	0.1975		0.1975		0.1975		0.5314	
Adjused R-Squared	0.1816		0.1816		0.1816		0.5221	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.0751

Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.4686
N-1	154
N-p-1	151
	0.4779

Results of Panel Data Analysis - 3 Factor Model
Euro Zone Crisis - TW - Small Market Capitalisation

	Dependent Variables				Yes		
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects	OLS Firm Specific & Time	
Intercept	0.3125	***	0.3125	***	0.3125	0.1940	***
	(5.15)		(16.67)		(1.86)	(13.51)	
MRP	-4.2799	***	-4.2799	***	-4.2799	omitted	
	(-4.77)		(-16.39)		(-1.75)		
SMB	-0.5587	***	-0.5587	***	-0.5587	omitted	
	(-5.47)		(-3.14)		(-2.84)		
HML	0.1297		0.1297	***	0.1297	omitted	
	(0.96)		(3.93)		(0.46)		
Breusch-Pagan LM test							
Hausman test							
Observations	155		155		155	155	
Multicollinearity (vif)							
Heteroskedasticity (χ^2 - Stat)							
Serial Correlation (F- stat)							
R-Squared	0.3087		0.3087		0.3087	0.8959	
Adjused R-Squared	(0.2950)		(0.2950)		(0.2950)	0.8938	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.6015
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.1041
N-1	154
N-p-1	151
	0.1062

Results of Panel Data Analysis - 3 Factor Model
Euro Zone Crisis - China - Big Market Capitalisation

	Dependent Variables Pooled OLS		OLS Firm Specific Effects		Yes OLS Time Effects		OLS Firm Specific & Time	
Intercept	0.0163		0.0163	***	0.0163		0.0200	***
	(0.74)		(9.42)		(0.46)		(2.54)	
MRP	-0.2103		-0.2103	***	-0.2103		omitted	
	(-0.60)		(-6.40)		(-0.41)			
SMB	0.6102	***	0.6102	***	0.6102	***	omitted	
	(4.70)		(3.35)		(2.98)			
HML	0.6403	***	0.6403	***	0.6403	***	omitted	
	(5.50)		(6.03)		(4.34)			
Breusch-Pagan LM test								
Hausman test								
Observations	145		145		145		145	
Multicollinearity (vif)								
Heteroskedasticity (χ^2 - Stat)								
Serial Correlation (F- stat)								
R-Squared	0.2101		0.2101		0.2101		0.9333	
Adjused R-Squared			0.1933		0.1933		0.9319	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.9959
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.0667
N-1	144
N-p-1	141
	0.07

Results of Panel Data Analysis - 3 Factor Model
Euro Zone Crisis - Hong Kong - Big Market Capitalisation

	Dependent Variables							
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects		OLS Firm Specific & Time	
Intercept	0.0685	***	0.0685	***	0.0685		0.048	***
	(2.37)		(3.80)		(1.40)		(4.03)	
MRP	-1.0171	**	-1.0171	***	-1.0171		omitted	
	(-2.12)		(-3.49)		(-1.06)			
SMB	-0.0045		-0.0045		-0.0045		omitted	
	(-0.04)		(-0.03)		(-0.02)			
HML	0.3097	***	0.3097	***	0.3097	***	omitted	
	(5.37)		(2.39)		(3.43)			
Breusch-Pagan LM test								
Hausman test								
Observations	155		155		155		155	
Multicollinearity (vif)								
Heteroskedasticity (χ^2 - Stat)								
Serial Correlation (F- stat)								
R-Squared	0.2161		0.2161		0.2161		0.7338	
Adjused R-Squared	0.2005		0.2005		0.2005		0.7285	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.7670
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.2662
N-1	154
N-p-1	151
	0.271489

Results of Panel Data Analysis - 3 Factor Model
Euro Zone Crisis - Taiwan - Big Market Capitalisation

					Yes		
	Dependent Variables						
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects	OLS Firm Specific & Time	
Intercept	0.2314	***	0.2314	***	0.2314	0.1440	***
	(3.71)		(21.85)		(1.33)	(13.19)	
MRP	-3.3317	***	-3.3317	***	-3.3317	omitted	
	(-3.63)		(-21.50)		(-1.30)		
SMB	0.5293	**	0.5293	***	0.5293	omitted	
	(2.13)		(3.03)		(0.89)		
HML	-0.2814		-0.2814	***	-0.2814	omitted	
	(-1.50)		(-8.94)		(-0.69)		
Breusch-Pagan LM test							
Hausman test							
Observations	155		155		155	155	
Multicollinearity (vif)							
Heteroskedasticity (χ^2 - Stat)							
Serial Correlation (F- stat)							
R-Squared	0.1756		0.1756		0.1756	0.9738	
Adjused R-Squared	0.1593		0.1593		0.1593	0.9733	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.9994
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.0262
N-1	154
N-p-1	151

0.026721

Results of Panel Data Analysis - 3 Factor Model
Global Financial Crisis - China - World Model

	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects	OLS Firm Specific & Time	
	Dependent Variables				Yes		
Intercept	-0.0523	***	-0.0523	***	-0.0523	-0.1233	***
	(-2.38)		(-11.63)		(-0.47)	(-19.76)	
WMRP	0.0115		0.0115		0.0115	omitted	
	(0.03)		(0.15)		(0.01)		
WSMB	0.0150	***	0.0150	***	0.0150	0.0129	***
	(3.40)		(19.23)		(1.42)	(8.81)	
WHML	0.0218		0.0218	***	0.0218	-0.0666	***
	(1.08)		(6.89)		(0.39)	(-5.53)	
Breusch-Pagan LM test							
Hausman test							
Observations	900		900		900	900	
Multicollinearity (vif)							
Heteroskedasticity (χ^2 - Stat)							
Serial Correlation (F- stat)							
R-Squared	0.0168		0.0168		0.0168	0.9541	
Adjused R-Squared	0.0135		0.0135		0.0135	0.9539	
Test for the presence of fixed firm effect							
Fixed Effect Model - F test (p-value)	1.0000						
Test for the presence of time effect							
Time Dummies - F test (p-value)	0.0000						

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.0459
N-1	899
N-p-1	896
	0.05

Results of Panel Data Analysis - 3 Factor Model
Global Financial Crisis - China - International Model

	Dependent Variables				Yes			
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects		OLS Firm Specific & Time	
Intercept	-0.0195		-0.0195	***	-0.0195		-0.1237	***
	(-1.13)		(-4.75)		(-0.21)		(-18.96)	
DMRP	5.2154	***	5.2154	***	5.2154		omitted	
	(6.40)		(30.93)		-1.42			
DSMB	-3.9835	***	-3.9835	***	-3.9835	**	omitted	
	(-11.25)		(-17.19)		(-2.01)			
DHML	-0.2116		-0.2116	**	-0.2116		omitted	
	(-0.91)		(-2.20)		(-0.17)			
FMRP	-4.9418	***	-4.9418	***	-4.9418		omitted	
	(-6.87)		(-49.67)		(-1.29)			
FSMB	0.0046		0.0046	***	0.0046		omitted	
	(1.00)		(5.09)		(0.29)			
FHML	0.0259		0.0259	***	0.0259		omitted	
	(1.40)		(9.68)		(0.33)			
Breusch-Pagan LM test								
Hausman test								
Observations	900		900		900		900	
Multicollinearity (vif)								
Heteroskedasticity (χ^2 - Stat)								
Serial Correlation (F- stat)								
R-Squared	0.2042		0.2042		0.2042		0.9541	
Adjused R-Squared	0.1988		0.1988		0.1988		0.9538	
Test for the presence of fixed firm effect								
Fixed Effect Model - F test (p-value)	1.0000							
Test for the presence of time effect								
Time Dummies - F test (p-value)	0.0000							

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.0459
N-1	899
N-p-1	893
	0.0462

Results of Panel Data Analysis - 3 Factor Model
Global Financial Crisis - China - Domestics Model

	Dependent Variables							
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects (Yes)		OLS Firm Specific & Time	
Intercept	-0.0718	***	-0.0718	***	-0.0718		-0.1220	***
	(-4.40)		(-18.48)		(-0.94)		(-19.32)	
DMRP	2.0143	***	2.0143	***	2.0143		omitted	
	(3.26)		(13.67)		(0.64)			
DSMB	-4.0009	***	-4.0009	***	-4.0009	*	omitted	
	(-11.04)		(-17.19)		(-1.79)			
DHML	0.1381		0.1381		0.1381		omitted	
	(0.61)		(1.60)		(0.11)			
Breusch-Pagan LM test								
Hausman test								
Observations	900		900		900		900	
Multicollinearity (vif)								
Heteroskedasticity (χ^2 - Stat)								
Serial Correlation (F- stat)								
R-Squared	0.1456		0.1456		0.1456		0.9541	
Adjused R-Squared	0.1428		0.1428		0.1428		0.9539	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	1.0000
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.0459
N-1	899
N-p-1	896
	0.046054

Results of Panel Data Analysis - 3 Factor Model
Global Financial Crisis - Hong Kong - World Model

	Dependent Variables							
							Yes	
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects		OLS Firm Specific & Time	
Intercept	0.1511	***	0.1511	***	0.1511	***	-0.1824	***
	(5.82)		(6.57)		(1.30)		(-13.98)	
WMRP	-2.8241	***	-2.8241	***	-2.8241	***	omitted	
	(-5.89)		(-8.82)		(-1.28)			
WSMB	0.0276	***	0.0276	***	0.0276	***	0.0117	***
	(5.29)		(10.82)		(3.15)		(3.04)	
WHML	0.0434	*	0.0434	***	0.0434	***	-0.2251	***
	(1.83)		(2.50)		(1.35)		(-9.42)	
Breusch-Pagan LM test								
Hausman test								
Observations	900		900		900		900	
Multicollinearity (vif)								
Heteroskedasticity (χ^2 - Stat)								
Serial Correlation (F- stat)								
R-Squared	0.0748		0.0748		0.0748		0.5757	
Adjused R-Squared	0.0717		0.0717		0.0717		0.5743	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.0065
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.4243
N-1	899
N-p-1	896
	0.4257

Results of Panel Data Analysis - 3 Factor Model
Global Financial Crisis - Hong Kong - International Model

	Dependent Variables						Yes	
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects		OLS Firm Specific & Time	
Intercept	0.1399	***	0.1399	***	0.1399		-0.1821	***
	(5.70)		(6.57)		(1.35)		(-14.07)	
DMRP	-2.2099	*	-2.2099	***	-2.2099		omitted	
	(-1.86)		(-3.97)		(-0.56)			
DSMB	0.0345	***	0.0345	***	0.0345	***	0.0083	***
	(6.27)		(14.03)		(2.61)		(2.55)	
DHML	0.0574	**	0.0574	***	0.0574		-0.2279	***
	(2.34)		(3.68)		(1.15)		(-7.94)	
FMRP	-2.5501	***	-2.5501	***	-2.5501		omitted	
	(-3.09)		(-3.84)		(-0.71)			
FSMB	-1.2505	***	-1.2505	***	-1.2505		omitted	
	(-3.29)		(-8.61)		(-0.78)			
FHML	-0.9033	***	-0.9033	***	-0.9033		omitted	
	(-3.08)		(-8.81)		(-0.79)			
Breusch-Pagan LM test								
Hausman test								
Observations	900		900		900		900	
Multicollinearity (vif)								
Heteroskedasticity (χ^2 - Stat)								
Serial Correlation (F- stat)								
R-Squared	0.0786		0.0786		0.0786		0.5757	
Adjused R-Squared	0.0724		0.0724		0.0724		0.5728	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.0064
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.4243
N-1	899
N-p-1	893
	0.4272

Results of Panel Data Analysis - 3 Factor Model
Global Financial Crisis - Hong Kong - Domestics Model

	Dependent Variables						Yes	
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects		OLS Firm Specific & Time	
Intercept	0.1511	***	0.1511	***	0.1511	***	-0.1824	***
	(5.82)		(6.57)		(1.30)		(-13.98)	
WMRP	-2.8241	***	-2.8241	***	-2.8241	***	omitted	
	(-5.89)		(-8.82)		(-1.28)			
WSMB	0.0276	***	0.0276	***	0.0276	***	0.0117	***
	(5.29)		(10.82)		(3.15)		(3.04)	
WHML	0.0434	*	0.0434	***	0.0434	***	-0.2251	***
	(1.83)		(2.50)		(1.35)		(-9.42)	
Breusch-Pagan LM test								
Hausman test								
Observations	900		900		900		900	
Multicollinearity (vif)								
Heteroskedasticity (χ^2 - Stat)								
Serial Correlation (F- stat)								
R-Squared	0.0748		0.0748		0.0748		0.5757	
Adjused R-Squared	0.0717		0.0717		0.0717		0.5743	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.0065
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.4243
N-1	899
N-p-1	896
	0.4257

Results of Panel Data Analysis - 3 Factor Model
Global Financial Crisis - Taiwan - World Model

Yes

	Dependent Variables							
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects		OLS Firm Specific & Time	
Intercept	0.1219	***	0.1219	***	0.1219		-0.1566	***
	(3.31)		(2.94)		(1.04)		(-17.03)	
WMRP	-2.1837	***	-2.1837	***	-2.1837		omitted	
	(-3.21)		(-2.33)		(-0.98)			
WSMB	0.0199	***	0.0199	***	0.0199	*	0.0172	***
	(2.69)		(8.86)		(1.97)		(4.98)	
WHML	-0.0126		-0.0126		-0.0126		-0.2903	***
	(-0.38)		(-1.07)		(-0.32)		(-22.17)	
Breusch-Pagan LM test								
Hausman test								
Observations	900		900		900		900	
Multicollinearity (vif)								
Heteroskedasticity (χ^2 - Stat)								
Serial Correlation (F- stat)								
R-Squared	0.0203		0.0203		0.0203		0.2803	
Adjused R-Squared	0.0170		0.0170		0.0170		0.2779	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.3938
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.7197
N-1	899
N-p-1	896
	0.72211

Results of Panel Data Analysis - 3 Factor Model
Global Financial Crisis - Taiwan - International Model

	Dependent Variables				Yes			
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects		OLS Firm Specific & Time	
Intercept	0.1602	***	0.1602	***	0.1602		-0.1566	***
	(4.84)		(20.05)		(1.55)		(-17.03)	
DMRP	omitted		omitted		omitted		omitted	
DSMB	-3.0877	*	-3.0877	***	-3.0877		omitted	
	(-1.79)		(-2.57)		(-0.69)			
DHML	-6.0683	***	-6.0683	***	-6.0683	**	omitted	
	(-5.10)		(-2.77)		(-2.00)			
FMRP	-3.6548	***	-3.6548	***	-3.6548	*	omitted	
	(-5.06)		(-22.98)		(-1.68)			
FSMB	0.0180	**	0.0180	***	0.0180		0.0172	***
	(2.49)		(7.58)		(1.63)		(4.98)	
FHML	0.0210		0.0210	**	0.0210		-0.2905	***
	(0.63)		(2.08)		(0.41)		(-22.22)	
Breusch-Pagan LM test								
Hausman test								
Observations	900		900		900		900	
Multicollinearity (vif)								
Heteroskedasticity (χ^2 - Stat)								
Serial Correlation (F- stat)								
R-Squared	0.0726		0.0726		0.0726		0.2803	
Adjused R-Squared	0.0674		0.0674		0.0674		0.2755	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.3232
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.7197
N-1	899
N-p-1	893
	0.7245

Results of Panel Data Analysis - 3 Factor Model
Global Financial Crisis - Taiwan - Domestic Model

	Dependent Variables				Yes		
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects	OLS Firm Specific & Time	
Intercept	0.0066		0.0066	***	0.0066	-0.1528	***
	(0.86)		(2.28)		(0.33)	(-16.73)	
DMRP	omitted		omitted		omitted	omitted	
DSMB	-3.3326	*	-3.3326	***	-3.3326	omitted	
	(-1.90)		(-2.81)		(-0.69)		
DHML	-5.0422	***	-5.0422	***	-5.0422	omitted	
	(-4.21)		(-2.28)		(-1.61)		
Breusch-Pagan LM test							
Hausman test							
Observations	900		900		900	900	
Multicollinearity (vif)							
Heteroskedasticity (χ^2 - Stat)							
Serial Correlation (F- stat)							
R-Squared	0.0363		0.0363		0.0363	0.2803	
Adjused R-Squared	0.0341		0.0341		0.0341	0.2779	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.3698
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.7197
N-1	899
N-p-1	896
	0.7221

Lim, Chee Ming (2017) Noise-augmented asset pricing models:Evidence from the Greater China stock markets during two major financial crises. PhD thesis, University of Nottingham.

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Results of Panel Data Analysis - 3 Factor Model
Euro Zone Crisis - China - World Model

Yes

	Dependent Variables Pooled OLS		OLS Firm Specific Effects		OLS Time Effects		OLS Firm Specific & Time	
Intercept	-5.3354	***	-5.3354	***	-5.3354	***	-4.1424	***
	(-74.07)		(-108.06)		(-22.62)		(-108.06)	
WMRP	25.1392	***	25.1392	***	25.1392	***	omitted	
	(22.08)		(29.16)		(7.38)			
WSMB	0.7750	*	0.7750	*	0.7750		omitted	
	(1.72)		(1.83)		(0.61)			
WHML	0.7628		0.7628	***	0.7628		omitted	
	(1.52)		(3.44)		(0.38)			
Breusch-Pagan LM test								
Hausman test								
Observations	775		775		775		775	
Multicollinearity (vif)								
Heteroskedasticity (χ^2 - Stat)								
Serial Correlation (F- stat)								
R-Squared	0.3948		0.3948		0.3948		0.8704	
Adjused R-Squared	0.3924		0.3924		0.3924		0.8699	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	1.0000
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.

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1-R2	0.1296
N-1	774
N-p-1	771
	0.1301

Results of Panel Data Analysis - 3 Factor Model
Euro Zone Crisis - China - International Model

	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects		OLS Firm Specific & Time	
	Dependent Variables				Yes			
Intercept	-5.2343	***	-5.2343	***	-5.2343	***	-4.1424	***
	(-61.48)		(-87.63)		(-16.47)		(-166.95)	
DMRP	9.9780	***	9.9780	***	9.9780		omitted	
	(3.50)		(13.09)		(0.79)			
DSMB	-0.1565		-0.1565		-0.1565		omitted	
	(-0.26)		(-0.32)		(-0.09)			
DHML	1.8859	**	1.8859	***	1.8859		omitted	
	(2.01)		(3.58)		(0.49)			
FMRP	39.9349	***	39.9349	***	39.9349	**	omitted	
	(10.81)		(21.03)		(2.09)			
FSMB	1.3230	*	1.3230	***	1.3230		omitted	
	(1.76)		(3.39)		(0.56)			
FHML	1.9625	**	1.9625	***	1.9625		omitted	
	(2.21)		(14.10)		(0.63)			
Breusch-Pagan LM test								
Hausman test								
Observations	775		775		775		775	
Multicollinearity (vif)								
Heteroskedasticity (χ^2 - Stat)								
Serial Correlation (F- stat)								
R-Squared	0.3079		0.3079		0.3079		0.8704	
Adjused R-Squared	0.3025		0.3025		0.3025			

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	1.0000
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.1296
N-1	774
N-p-1	768
	0.1306

Results of Panel Data Analysis - 3 Factor Model
Euro Zone Crisis - China - Domestics Model

	Dependent Variables				Yes			
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects		OLS Firm Specific & Time	
Intercept	-4.7585	***	-4.7585	***	-4.7585	***	-4.1424	***
	(-62.96)		(-132.60)		(-17.24)		(-166.95)	
DMRP	30.3165	***	30.3165	***	30.3165	***	omitted	
	(13.09)		(22.90)		(3.64)			
DSMB	0.8740	*	0.8740	**	0.8740		omitted	
	(1.67)		(2.20)		(0.68)			
DHML	1.6714	*	1.6714	***	1.6714		omitted	
	(1.76)		(3.14)		(0.35)			
Breusch-Pagan LM test								
Hausman test								
Observations	775		775		775		775	
Multicollinearity (vif)								
Heteroskedasticity (χ^2 - Stat)								
Serial Correlation (F- stat)								
R-Squared	0.1983		0.1983		0.1983		0.8704	
Adjused R-Squared	0.1952		0.1952		0.1952		0.8699	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	1.0000
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.1296
N-1	774
N-p-1	771
	0.130104

Results of Panel Data Analysis - 3 Factor Model
Euro Zone Crisis - Hong Kong - World Model

	Dependent Variables					Yes		
	Pooled OLS			OLS Firm Specific Effects		OLS Time Effects	OLS Firm Specific & Time	
Intercept	0.0472		**	0.0472	**	0.0472	0.1858	***
	(2.00)			(2.14)		(0.83)	(3.70)	
WMRP	-0.7433		**	-0.7433	***	-0.7433	-3.5067	***
	(-1.99)			(-2.37)		(-0.81)	(-4.75)	
WSMB	-0.3200		**	-0.3200		-0.3200	omitted	
	(-2.17)			(-1.48)		(-0.70)		
WHML	0.4225		***	0.4225	*	0.4225	omitted	
	(2.56)			(1.96)		(1.01)		
Breusch-Pagan LM test								
Hausman test								
Observations		775		775		775	775	
Multicollinearity (vif)								
Heteroskedasticity (χ^2 - Stat)								
Serial Correlation (F- stat)								
R-Squared	0.0151			0.0151		0.0151	0.2979	
Adjused R-Squared	0.0112			0.0112		0.0112	0.2952	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.2042
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.7021
N-1	774
N-p-1	771
	0.704832

Results of Panel Data Analysis - 3 Factor Model
Euro Zone Crisis - Hong Kong - International Model

Yes

	Dependent Variables Pooled OLS		OLS Firm Specific Effects		OLS Time Effects		OLS Firm Specific & Time	
Intercept	0.0767	***	0.0767	***	0.0767		0.0456	**
	(3.65)		(3.54)		(1.55)		(2.09)	
DMRP	3.1236	**	3.1236	***	3.1236		omitted	
	(2.24)		(3.22)		(0.92)			
DSMB	0.6510	***	0.6510	*	0.6510		omitted	
	(2.78)		(1.90)		(0.85)			
DHML	-0.6006	***	-0.6006		-0.6006		omitted	
	(-2.30)		(-1.63)		(-0.91)			
FMRP	-3.7272	***	-3.7272	***	-3.7272	*	omitted	
	(-4.56)		(-4.90)		(-1.95)			
FSMB	-0.1632		-0.1632		-0.1632		omitted	
	(-0.87)		(-0.73)		(-0.33)			
FHML	1.3772	***	1.3772	***	1.3772	***	omitted	
	(4.80)		(4.92)		(2.66)			
Breusch-Pagan LM test								
Hausman test								
Observations	775		775		775		775	
Multicollinearity (vif)								
Heteroskedasticity (χ^2 - Stat)								
Serial Correlation (F- stat)								
R-Squared	0.0668		0.0668		0.0668		0.2979	
Adjused R-Squared	0.0595		0.0595		0.0595		0.2924	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.1544

Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.7021
N-1	774
N-p-1	768
	0.7076

Results of Panel Data Analysis - 3 Factor Model

Euro Zone Crisis - Hong Kong - Domestic Model

Yes

	Dependent Variables						
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects	OLS Firm Specific & Time	
Intercept	0.0168		0.0168		0.0168	0.0456	***
	(0.87)		(0.93)		(0.35)	(2.09)	
DMRP	-0.8421		-0.8421		-0.8421	omitted	
	(-1.01)		(-1.28)		(-0.38)		
DSMB	0.6580	***	0.6580	***	0.6580	omitted	
	(3.25)		(2.98)		(1.07)		
DHML	-0.4746	*	-0.4746		-0.4746	omitted	
	(-1.95)		(-1.39)		(-0.73)		
Breusch-Pagan LM test							
Hausman test							
Observations	775		775		775	775	
Multicollinearity (vif)							
Heteroskedasticity (χ^2 - Stat)							
Serial Correlation (F- stat)							
R-Squared	0.0143		0.0143		0.0143	0.2979	
Adjused R-Squared	0.0105		0.0105		0.0105	0.2952	
Test for the presence of fixed firm effect							
Fixed Effect Model - F test (p-value)	0.2050						
Test for the presence of time effect							
Time Dummies - F test (p-value)	0.0000						

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where

R^2 = sample R-square

p = Number of predictors

N = Total sample size.

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1-R2	0.7021
N-1	774
N-p-1	771
	0.7048

Results of Panel Data Analysis - 3 Factor Model
Euro Zone Crisis - Taiwan - World Model

	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects		OLS Firm Specific & Time	
	Dependent Variables				Yes			
Intercept	0.0408	***	0.0408	***	0.0408		0.1540	***
	(2.95)		(10.19)		(0.66)		(18.27)	
WMRP	-0.7925	***	-0.7925	***	-0.7925		omitted	
	(-3.63)		(-14.15)		(-0.77)			
WSMB	-0.3810	***	-0.3810	***	-0.3810		omitted	
	(-4.42)		(-12.91)		(-0.80)			
WHML	0.8387	***	0.8387	***	0.8387	**	omitted	
	(8.71)		(27.77)		(2.13)			
Breusch-Pagan LM test								
Hausman test								
Observations	775		775		775		775	
Multicollinearity (vif)								
Heteroskedasticity (χ^2 - Stat)								
Serial Correlation (F- stat)								
R-Squared	0.1059		0.1059		0.1059		0.8677	
Adjused R-Squared	0.1024		0.1024		0.1024		0.8672	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	1.0000
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.1323
N-1	774
N-p-1	771
	0.132815

Results of Panel Data Analysis - 3 Factor Model
Euro Zone Crisis - Taiwan - International Model

	Dependent Variables				Yes			
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects		OLS Firm Specific & Time	
Intercept	-0.0405	***	-0.0405	***	-0.0405		0.1540	***
	(-2.51)		(-3.62)		(-1.42)		(18.27)	
DMRP	7.3351	***	7.3351	***	7.3351	**	omitted	
	(4.68)		(7.11)		(2.18)			
DSMB	7.9134	***	7.9134	***	7.9134	***	omitted	
	(6.84)		(20.39)		(2.80)			
DHML	-2.3542	***	-2.3542	***	-2.3542		omitted	
	(-2.71)		(-2.64)		(-1.50)			
FMRP	-0.7912	***	-0.7912	***	-0.7912		omitted	
	(-3.81)		(-15.08)		'(-0.82)			
FSMB	-0.3600	***	-0.3600	***	-0.3600		omitted	
	(-4.15)		(-17.50)		(-0.76)			
FHML	0.7313	***	0.7313	***	0.7313	**	omitted	
	(7.31)		(28.18)		(1.96)			
Breusch-Pagan LM test								
Hausman test								
Observations	775		775		775		775	
Multicollinearity (vif)								
Heteroskedasticity (χ^2 - Stat)								
Serial Correlation (F- stat)								
R-Squared	0.2190		0.2190		0.2190		0.8677	
Adjused R-Squared	0.2129		0.2129		0.2129		0.8667	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	1.0000
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.1323
N-1	774
N-p-1	768
	0.1333

Results of Panel Data Analysis - 3 Factor Model
Euro Zone Crisis - Taiwan - Domestic Model

	Dependent Variables				Yes			
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects		OLS Firm Specific & Time	
Intercept	-0.0640	***	-0.0640	***	-0.0640		0.0154	***
	(-4.30)		(-6.37)		(0.00)		(18.63)	
DMRP	5.4733	***	5.4733	***	5.4733	***	omitted	
	(3.61)		(5.42)		(3.92)			
DSMB	10.8068	***	10.8068	***	10.8068	***	omitted	
	(9.91)		(26.17)		(6.48)			
DHML	-4.2511	***	-4.2511	***	-4.2511	***	omitted	
	(-4.91)		(-4.82)		(-3.72)			
Breusch-Pagan LM test								
Hausman test								
Observations	775		775		775		775	
Multicollinearity (vif)								
Heteroskedasticity (χ^2 - Stat)								
Serial Correlation (F- stat)								
R-Squared	0.1548		0.1548		0.1548		0.8677	
Adjused R-Squared	0.1515		0.1515		0.1515		0.8672	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	1.0000

Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.1323
N-1	774
N-p-1	771
	0.1328

Results of Panel Data Analysis - 5 Factor Model
Global Financial Crisis - China

	Dependent Variables				Yes			
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects		OLS Firm Specific & Time	
Intercept	0.0394	***	0.0394	***	0.0394		-0.122	***
	(2.50)		(9.81)		(0.60)		(-19.32)	
MRP	-1.0964	***	-1.0964	***	-1.0964		omitted	
	(-3.58)		(-15.71)		(-0.74)			
SMB	-2.2699	***	-2.2699	***	-2.2699	**	omitted	
	(-12.38)		(-20.67)		(-2.07)			
HML	-0.0165		-0.0165		-0.0165		omitted	
	(-0.13)		(-0.37)		(-0.02)			
Investment	-1.1933	***	-1.1933	***	-1.1933		omitted	
	(-3.81)		(-15.97)		(-0.83)			
Profitability	0.8800	***	0.8800	***	0.8800		omitted	
	(2.99)		(11.32)		(0.74)			
Breusch-Pagan LM test								
Hausman test								
Observations	900		900		900		900	
Multicollinearity (vif)								
Heteroskedasticity (χ^2 - Stat)								
Serial Correlation (F- stat)								
R-Squared	0.1593		0.1593		0.1593		0.9541	
Adjused R-Squared	0.1546		0.1546		0.1546		0.9538	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	1.0000
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.

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1-R2	0.0459
N-1	899
N-p-1	894
	0.0462

Results of Panel Data Analysis - 5 Factor Model
Global Financial Crisis - Hong Kong

	Dependent Variables						Yes	
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects		OLS Firm Specific & Time	
Intercept	0.0624	***	0.0624	***	0.0624	**	-0.1832	***
	(3.81)		(5.12)		(2.05)		(-14.05)	
MRP	-0.8766	***	-0.8766	***	-0.8766	*	omitted	
	(-3.27)		(-5.49)		(-1.71)		(collinearity)	
SMB	0.0030	*	0.0030	***	0.0030		0.0028	**
	(1.87)		(2.87)		(0.89)		(2.36)	
HML	0.0352	***	0.0352	***	0.0352	*	-0.0829	***
	(5.07)		(5.36)		(1.76)		(-7.93)	
Investment	-0.6190	***	-0.6190	***	-0.6190	***	omitted	
	(-15.28)		(-10.19)		(-5.39)		(collinearity)	
Profitability	-0.1454		-0.1454		-0.1454		omitted	
	(-1.53)		(-0.95)		(-0.78)		(collinearity)	
Breusch-Pagan LM test								
Hausman test								
Observations	900		900		900		900	
Multicollinearity (vif)								
Heteroskedasticity (χ^2 - Stat)								
Serial Correlation (F- stat)								
R-Squared	0.4363		0.4363		0.4363		0.5757	
Adjused R-Squared	0.4331		0.4331		0.4331		0.5733	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.0000
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.4243
N-1	899
N-p-1	894
	0.4267

Results of Panel Data Analysis - 5 Factor Model
Global Financial Crisis - Taiwan

	Dependent Variables				Yes			
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects		OLS Firm Specific & Time	
Intercept	0.2947	***	0.2947	***	0.2947	***	-0.1528	***
	(5.70)		(27.54)		(2.74)		(-17.07)	
MRP	-4.1643	***	-4.1643	***	-4.1643	***	omitted	
	(-5.11)		(-25.38)		(-2.59)			
SMB	-0.8928	***	-0.8928	***	-0.8928		omitted	
	(-4.20)		(-6.48)		(-1.60)			
HML	-0.6704	***	-0.6704	***	-0.6704	*	omitted	
	(-3.32)		(-6.45)		(-1.72)			
Investment	-0.1713		-0.1713		-0.1713		omitted	
	(-0.83)		(-0.73)		(-0.42)			
Profitability	-1.1055	***	-1.1055	***	-1.1055	*	omitted	
	(-4.28)		(-8.34)		(-1.67)			
Breusch-Pagan LM test								
Hausman test								
Observations	900		900		900		900	
Multicollinearity (vif)								
Heteroskedasticity (χ^2 - Stat)								
Serial Correlation (F- stat)								
R-Squared	0.1122		0.1122		0.1122		0.2803	
Adjusted R-Squared	0.1072		0.1072		0.1072		0.2763	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.2682
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.7197
N-1	899
N-p-1	894
	0.7237

Results of Panel Data Analysis - 5 Factor Model
Euro Zone Crisis - China

	Dependent Variables				Yes			
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects		OLS Firm Specific & Time	
Intercept	-5.0032	***	-5.0032	***	-5.0032	***	-4.1424	***
	(-82.21)		(-203.37)		(-22.11)		(-166.95)	
MRP	19.4718	***	19.4718	***	19.4718	***	omitted	
	(19.92)		(37.14)		(5.43)			
SMB	0.5967	*	0.5967	***	0.5967		omitted	
	(1.93)		(2.53)		(0.57)			
HML	-0.4040		-0.4040	*	-0.4040		omitted	
	(-0.67)		(-1.65)		(-0.13)			
Investment	1.6675		1.6675	***	1.6675		omitted	
	(1.59)		(5.71)		(0.35)			
Profitability	-0.5696	***	-0.5696	***	-0.5696		omitted	
	(-2.60)		(-6.94)		(-0.45)			
Breusch-Pagan LM test								
Hausman test								
Observations	775		775		775		775	
Multicollinearity (vif)								
Heteroskedasticity (χ^2 - Stat)								
Serial Correlation (F- stat)								
R-Squared	0.3651		0.3651		0.3651		0.8704	
Adjusted R-Squared	0.3610		0.3610		0.3610		0.8696	

Test for the presence of fixed firm effect
Fixed Effect Model - F test (p-value) 1.0000

Test for the presence of time effect
Time Dummies - F test (p-value) 0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.1296
N-1	774
N-p-1	769
	0.130443

Results of Panel Data Analysis - 5 Factor Model
Euro Zone Crisis - Hong Kong

	Dependent Variables				Yes	
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects	OLS Firm Specific & Time
Intercept	0.0411	*	0.0411	***	0.0411	0.0456
	(1.70)		(2.31)		(0.68)	(2.09)
MRP	-0.7528	*	-0.7528	***	-0.7528	omitted
	(-1.93)		(-3.18)		(-0.72)	
SMB	0.0024		0.0024		0.0024	omitted
	(0.03)		(0.03)		(0.01)	
HML	-0.1919	**	-0.1919		-0.1919	omitted
	(-2.20)		(-1.64)		(-0.89)	
Investment	-0.2059	***	-0.2059		-0.2059	omitted
	(-2.93)		(-1.53)		(-1.26)	
Profitability	-0.4514	***	-0.4514	***	-0.4514	omitted
	(-4.03)		(-3.55)		(-1.46)	
Breusch-Pagan LM test						
Hausman test						
Observations	775		775		775	775
Multicollinearity (vif)						
Heteroskedasticity (χ^2 - Stat)						
Serial Correlation (F- stat)						
R-Squared	0.0607		0.0607		0.0607	0.2979
Adjusted R-Squared	0.0546		0.0546		0.0546	0.2933

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.1593
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.7021
N-1	774
N-p-1	769
	0.7067

Results of Panel Data Analysis - 5 Factor Model
Euro Zone Crisis - Taiwan

	Dependent Variables Pooled OLS		OLS Firm Specific Effects		OLS Time Effects		OLS Firm Specific & Time	
					Yes			
Intercept	0.3383	***	0.3383	***	0.3383	**	0.1540	***
	(10.48)		(27.65)		(2.13)		(25.67)	
MRP	-4.8333	***	-4.8333	***	-4.8333	**	omitted	
	(-10.49)		(-30.71)		(-2.14)			
SMB	-0.7761	***	-0.7761	***	-0.7761		omitted	
	(-6.68)		(-16.26)		(-1.32)			
HML	-0.0125		-0.0125		-0.0125		omitted	
	(-0.13)		(-0.12)		(-0.03)			
Investment	-0.5041	**	-0.5041	***	-0.5041		omitted	
	(-2.10)		(-5.40)		(-0.38)			
Profitability	0.1168		0.1168		0.1168		omitted	
	(0.64)		(1.51)		(0.12)			
Breusch-Pagan LM test								
Hausman test								
Observations	775		775		775		775	
Multicollinearity (vif)								
Heteroskedasticity (χ^2 - Stat)								
Serial Correlation (F- stat)								
R-Squared	0.1978		0.1978		0.1978		0.8677	
Adjusted R-Squared	0.1925		0.1925		0.1925		0.8668	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	1.0000
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.1323
N-1	774
N-p-1	769
	0.1332

Results of Panel Data Analysis - 5 Factor Model
Global Financial Crisis - China - Small Market Capitalisation

	Dependent Variables				Yes		
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects		OLS Firm Specific & Time
Intercept	0.0584	*	0.0584	***	0.0584		0.0108
	(1.93)		(6.34)		(0.83)		(-0.52)
MRP	-0.6636		-0.6636	***	-0.6636		omitted
	(-1.08)		(-4.16)		(-0.43)		
SMB	-0.9115	***	-0.9115	***	-0.9115	**	omitted
	(-4.54)		(-4.24)		(-2.13)		
HML	-0.2143		-0.2143	***	-0.2143		omitted
	(-0.91)		(-2.58)		(-0.44)		
Investment	0.0195		0.0195		0.0195		omitted
	(0.08)		(0.68)		(0.04)		
Profitability	0.5363	**	0.5363	***	0.5363		omitted
	(2.28)		(7.31)		(1.38)		
Breusch-Pagan LM test							
Hausman test							
Observations	180		180		180		180
Multicollinearity (vif)							
Heteroskedasticity (χ^2 - Stat)							
Serial Correlation (F- stat)							
R-Squared	0.2339		0.2339		0.2339		0.8988
Adjusted R-Squared	0.2118		0.2118		0.2118		0.8959

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.9521
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.1012
N-1	179
N-p-1	174
	0.10411

Results of Panel Data Analysis - 5 Factor Model
Global Financial Crisis - Hong Kong - Small Market Capitalisation

	Dependent Variables Pooled OLS		OLS Firm Specific Effects		OLS Time Effects		OLS Firm Specific & Time	
Intercept	0.1197	***	0.1197	***	0.1197	***	-0.2600	***
	(3.47)		(7.13)		(2.13)		(-10.13)	
MRP	-1.6899	***	-1.6899	***	-1.6899		omitted	
	(-3.03)		(-7.20)		(-1.60)			
SMB	0.1989	*	0.1989		0.1989		omitted	
	(1.75)		(1.10)		(0.67)			
HML	0.0957		0.0957	*	0.0957		-1.3636	***
	(0.78)		(1.84)		(0.37)		(-6.64)	
Investment	0.1208		0.1208	**	0.1208		omitted	
	(1.15)		(2.04)		(0.58)			
Profitability	-0.6433	***	-0.6433	***	-0.6433	*	omitted	
	(-5.42)		(-14.17)		(-1.75)			
Breusch-Pagan LM test								
Hausman test								
Observations	180		180		180		180	
Multicollinearity (vif)								
Heteroskedasticity (χ^2 - Stat)								
Serial Correlation (F- stat)								
R-Squared	0.2436		0.2436		0.2436		0.7885	
Adjusted R-Squared	0.2218		0.2218		0.2218		0.7824	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.0937

Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.2115
N-1	179
N-p-1	174
	0.217578

Results of Panel Data Analysis - 5 Factor Model
Global Financial Crisis - Taiwan - Small Market Capitalisation

Yes

Dependent Variables

	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects	OLS Firm Specific & Time	
Intercept	0.0313		0.0313		0.0313	-0.1662	***
	(0.98)		(1.00)			(-6.53)	
MRP	-0.0382		-0.0382		-0.0382	0.4695	
	(-0.07)		(-0.07)			(1.31)	
SMB	-0.6214	***	-0.6214	***	-0.6214	0.2724	
	(-3.60)		(-3.41)			(1.20)	
HML	-0.8127	***	-0.8127	***	-0.8127	omitted	
	(-4.67)		(-10.15)				
Investment	-0.0464		-0.0464		-0.0464	omitted	
	(-0.11)		(-0.94)				
Profitability	-0.2811		-0.2811	***	-0.2811	omitted	
	(-0.79)		(-5.35)				
Breusch-Pagan LM test							
Hausman test							
Observations	180		180		180	180	
Multicollinearity (vif)							
Heteroskedasticity (χ^2 - Stat)							
Serial Correlation (F- stat)							
R-Squared	0.1995		0.1995		0.1995	0.4221	
Adjused R-Squared	0.1765		0.1765		0.1765	0.4055	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.0104

Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0002

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.5779
N-1	179
N-p-1	174
	0.5945

Results of Panel Data Analysis - 5 Factor Model
Global Financial Crisis - China - Big Market Capitalisation

	Dependent Variables Pooled OLS	OLS Firm Specific Effects	Yes OLS Time Effects	OLS Firm Specific & Time
Intercept	0.0240	0.0240 ***	0.0240	-0.0580 ***
	(0.72)	(10.99)	(0.31)	(-6.20)
MRP	-0.5190	-0.5190 ***	-0.5190	omitted
	(-0.78)	(-12.46)	(-0.33)	
SMB	0.5514	0.5514 ***	0.5514	omitted
	(1.87)	(3.28)	(0.83)	
HML	-0.0944	-0.0944 ***	-0.0944	omitted
	(-0.34)	(-3.72)	(-0.14)	
Investment	0.0495	0.0495 ***	0.0495	omitted
	(0.29)	(8.01)	(0.27)	
Profitability	0.4930	0.4930 ***	0.4930 *	omitted
	(2.54)	(34.72)	(1.70)	
Breusch-Pagan LM test				
Hausman test				
Observations	180	180	180	180
Multicollinearity (vif)				
Heteroskedasticity (χ^2 - Stat)				
Serial Correlation (F- stat)				
R-Squared	0.0597	0.0597	0.0597	0.9755
Adjusted R-Squared	0.0327	0.0327	0.0327	0.9748

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.9853
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.

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1-R2	0.0245
N-1	179
N-p-1	174
	0.0252

Results of Panel Data Analysis - 5 Factor Model
Global Financial Crisis - Hong Kong - Big Market Capitalisation

Yes

	Dependent Variables Pooled OLS		OLS Firm Specific Effects		OLS Time Effects		OLS Firm Specific & Time	
Intercept	0.1516	***	0.1516	***	0.1516	***	-0.1960	***
	(4.80)		(18.43)		(3.12)		(-28.90)	
MRP	-2.1308	***	-2.1308	***	-2.1308	***	omitted	
	(-4.16)		(-20.78)		(-2.63)			
SMB	-0.2763	*	-0.2763		-0.2763		omitted	
	(-1.78)		(-1.48)		(-0.89)			
HML	0.1321		0.1321		0.1321		omitted	
	(1.05)		(1.32)		(0.53)			
Investment	0.0474		0.0474	**	0.0474		omitted	
	(0.32)		(2.05)		(0.16)			
Profitability	-1.4235	***	-1.4235	***	-1.4235	***	omitted	
	(-11.35)		(-18.91)		(-5.55)			
Breusch-Pagan LM test								
Hausman test								
Observations	180		180		180		180	
Multicollinearity (vif)								
Heteroskedasticity (χ^2 - Stat)								
Serial Correlation (F- stat)								
R-Squared	0.4638		0.4638		0.4638		0.8376	
Adjusted R-Squared	0.4484		0.4484		0.4484		0.8329	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.9631

Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.1624
N-1	179
N-p-1	174

0.167067

Results of Panel Data Analysis - 5 Factor Model
Global Financial Crisis - Taiwan - Big Market Capitalisation

	Dependent Variables			Yes
	Pooled OLS	OLS Firm Specific Effects	OLS Time Effects	OLS Firm Specific & Time
Intercept	0.0025	0.0025	0.0025	-0.1399 ***
	(0.17)	(0.26)	(0.14)	(-8.50)
MRP	-0.141	-0.141	-0.141	-0.0031
	(-0.60)	(-1.02)	(-0.86)	(-0.17)
SMB	0.8646 ***	0.8646 ***	0.8646	omitted
	(4.22)	(5.22)	(1.39)	
HML	-0.2567	-0.2567 ***	-0.2567	omitted
	(-1.47)	(-11.88)	(-0.65)	
Investment	2.1690 ***	2.1690 ***	2.1690 ***	omitted
	(8.64)	(23.62)	(6.92)	
Profitability	-2.1816 ***	-2.1816 ***	-2.1816 ***	omitted
	(-9.22)	(-23.69)	(-4.05)	
Breusch-Pagan LM test				
Hausman test				
Observations	180	180	180	180
Multicollinearity (vif)				
Heteroskedasticity (χ^2 - Stat)				
Serial Correlation (F- stat)				
R-Squared	0.5158	0.5158	0.5158	0.9677
Adjusted R-Squared	0.5019	0.5019	0.5019	0.9668

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.3815

Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.0323
N-1	179
N-p-1	174
	0.0332

Results of Panel Data Analysis - 5 Factor Model
Euro Zone Crisis - China - Small Market Capitalisation

	Dependent Variables				Yes		
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects		OLS Firm Specific & Time
Intercept	0.0220		0.0220	***	0.0220		0.0420
	(1.40)		(14.39)		(0.72)		(10.07)
MRP	0.1267		0.1267	***	0.1267		omitted
	(0.49)		(4.01)		(0.25)		
SMB	-1.4897	***	-1.4897	***	-1.4897	***	omitted
	(-9.44)		(-8.33)		(-4.70)		
HML	-0.4744	***	-0.4744	***	-0.4744	*	omitted
	(-3.96)		(-15.72)		(-1.93)		
Investment	0.5883	***	0.5883	***	0.5883	*	omitted
	(3.56)		(13.17)		(1.69)		
Profitability	-1.0545	***	-1.0545	***	-1.0545	***	omitted
	(-7.97)		(-42.97)		(-4.82)		
Breusch-Pagan LM test							
Hausman test							
Observations	145		145		145		145
Multicollinearity (vif)							
Heteroskedasticity (χ^2 - Stat)							
Serial Correlation (F- stat)							
R-Squared	0.5688		0.5688		0.5688		0.9644
Adjusted R-Squared	0.5533		0.5533		0.5533		0.9631

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.9296
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.0356
N-1	144
N-p-1	139
	0.036881

Results of Panel Data Analysis - 5 Factor Model
Euro Zone Crisis - Hong Kong - Small Market Capitalisation

	Dependent Variables				Yes			
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects		OLS Firm Specific & Time	
Intercept	0.1134	***	0.1134	***	0.1134	**	0.0960	*
	(2.97)		(13.52)		(2.12)		(1.75)	
MRP	-1.7853	***	-1.7853	***	-1.7853	**	omitted	
	(-3.06)		(-16.44)		(-2.22)			
SMB	0.1123		0.1123		0.1123		omitted	
	(1.43)		(0.61)		(1.04)			
HML	-0.3441	***	-0.3441	***	-0.3441	**	omitted	
	(-3.04)		(-3.41)		(-2.56)			
Investment	0.1363	**	0.1363	***	0.1363		omitted	
	(2.16)		(8.85)		(1.64)			
Profitability	0.2012		0.2012	***	0.2012		omitted	
	(1.61)		(3.12)		(1.08)			
Breusch-Pagan LM test								
Hausman test								
Observations	155		155		155		155	
Multicollinearity (vif)								
Heteroskedasticity (χ^2 - Stat)								
Serial Correlation (F- stat)								
R-Squared	0.2596		0.2596		0.2596		0.5314	
Adjusted R-Squared	0.2348		0.2348		0.2348		0.5189	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.0586
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.4686
N-1	154
N-p-1	150
	0.481096

Results of Panel Data Analysis - 5 Factor Model
Euro Zone Crisis - Taiwan - Small Market Capitalisation

Yes

	Dependent Variables Pooled OLS		OLS Firm Specific Effects		OLS Time Effects		OLS Firm Specific & Time	
Intercept	0.2937	***	0.2937	***	0.2937	***	0.1940	***
	(4.85)		(14.94)		(2.38)		(13.51)	
MRP	-4.0573	***	-4.0573	***	-4.0573	***	omitted	
	(-4.57)		(-14.34)		(-2.22)			
SMB	-0.5832	***	-0.5832	***	-0.5832	***	omitted	
	(-4.79)		(-3.51)		(-2.37)			
HML	0.0967		0.0967	***	0.0967		omitted	
	(0.80)		(3.29)		(0.44)			
Investment	1.1791	***	1.1791	***	1.1791	***	omitted	
	(5.99)		(15.80)		(3.27)			
Profitability	-1.5247	***	-1.5247	***	-1.5247	***	omitted	
	(-6.05)		(-33.42)		(-3.14)			
Breusch-Pagan LM test								
Hausman test								
Observations	155		155		155		155	
Multicollinearity (vif)								
Heteroskedasticity (χ^2 - Stat)								
Serial Correlation (F- stat)								
R-Squared	0.4648		0.4648		0.4648		0.8959	
Adjusted R-Squared	0.4468		0.4468		0.4468		0.8924	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.4770
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

1-R2	0.1041
N-1	154
N-p-1	149
	0.107593

Results of Panel Data Analysis - 5 Factor Model

Euro Zone Crisis - China - Big Market Capitalisation

	Dependent Variables				Yes			
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects		OLS Firm Specific & Time	
Intercept	0.0066		0.0066		0.0066		0.0200	**
	(0.29)		(3.20)		(0.18)		(2.54)	
MRP	-0.1744		-0.1744		-0.1744		omitted	
	(-0.50)		(-5.02)		(-0.33)			
SMB	0.9210	***	0.9210		0.9210	**	omitted	
	(4.38)		(4.95)		(2.07)			
HML	0.6158	***	0.6158		0.6158	***	omitted	
	(5.07)		(62.06)		(3.73)			
Investment	0.3341		0.3341		0.3341		omitted	
	(1.30)		(17.99)		(0.45)			
Profitability	0.1539		0.1539		0.1539		omitted	
	(1.28)		(11.65)		(0.42)			
Breusch-Pagan LM test								
Hausman test								
Observations	145		145		145		145	
Multicollinearity (vif)								
Heteroskedasticity (χ^2 - Stat)								
Serial Correlation (F- stat)								
R-Squared	0.2344		0.2344		0.2344		0.9333	
Adjusted R-Squared	0.2069		0.2069		0.2069		0.9309	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.9958
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1- \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where

R^2 = sample R-square

p = Number of predictors

N = Total sample size.

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1-R2	0.0667
N-1	144
N-p-1	139
	0.0691

Results of Panel Data Analysis - 5 Factor Model
Euro Zone Crisis - Hong Kong - Big Market Capitalisation

	Dependent Variables			Yes
	Pooled OLS	OLS Firm Specific Effects	OLS Time Effects	OLS Firm Specific & Time
Intercept	0.0650 **	0.0650 ***	0.0650	0.0480 ***
	(2.17)	(3.72)	(1.24)	(4.03)
MRP	-0.9372 *	-0.9372 ***	-0.9372	omitted
	(-1.83)	(-3.96)	(-0.84)	
SMB	-0.0097	-0.0097	-0.0097	omitted
	(-0.05)	(-0.04)	(-0.02)	
HML	0.3253 ***	0.3253 ***	0.3253	omitted
	(2.64)	(4.19)	(1.22)	
Investment	0.0244	0.0244	0.0244	omitted
	(0.16)	(0.32)	(0.07)	
Profitability	-0.1082	-0.1082	-0.1082	omitted
	(-0.47)	(-0.80)	(-0.25)	
Breusch-Pagan LM test				
Hausman test				
Observations	155	155	155	155
Multicollinearity (vif)				
Heteroskedasticity (χ^2 - Stat)				
Serial Correlation (F- stat)				
R-Squared	0.2174	0.2174	0.2174	0.7338
Adjusted R-Squared	0.1911	0.1911	0.1911	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.7710

Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.2662
N-1	154
N-p-1	150

Results of Panel Data Analysis - 5 Factor Model

Euro Zone Crisis - Taiwan - Big Market Capitalisation

	Dependent Variables				Yes		
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects		OLS Firm Specific & Time
Intercept	0.2804	***	0.2804	***	0.2804	**	0.1440
	(5.16)		(46.42)		(2.43)		(46.42)
MRP	-4.0112	***	-4.0112	***	-4.0112	**	omitted
	(-5.02)		(-45.35)		(-2.33)		
SMB	0.6425	***	0.6425	***	0.6425		omitted
	(2.92)		(3.90)		(1.36)		
HML	-0.3217	**	-0.3217	***	-0.3217		omitted
	(-2.24)		(-12.29)		(-1.18)		
Investment	3.0850	***	3.0850	***	3.0850	***	omitted
	(10.00)		(23.79)		(4.63)		
Profitability	-2.2734	***	-2.2734	***	-2.2734	***	omitted
	(-9.96)		(-43.13)		(-4.96)		
Breusch-Pagan LM test							
Hausman test							
Observations	155						155
Multicollinearity (vif)							
Heteroskedasticity (χ^2 - Stat)							
Serial Correlation (F- stat)							
R-Squared	0.5332		0.5332		0.5332		0.9738
Adjusted R-Squared	0.5176		0.5176		0.5176		0.9729

Test for the presence of fixed firm effect			
Fixed Effect Model - F test (p-value)	0.9982		
Test for the presence of time effect			
Time Dummies - F test (p-value)	0.0000		

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where

R^2 = sample R-square

p = Number of predictors

N = Total sample size.

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1-R2	0.0262
N-1	154
N-p-1	149
	0.027079

Results of Panel Data Analysis - 5 Factor Model
Global Financial Crisis - China - World Model

	Dependent Variables				Yes			
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects		OLS Firm Specific & Time	
Intercept	-0.0382	**	-0.0382	***	-0.0382		-0.1233	***
	(-1.99)		(-8.62)		(-0.45)		(-19.26)	
WMRP	0.0999		0.0999		0.0999		omitted	
	(0.28)		(1.30)		(0.06)			
WSMB	0.0041		0.0041	***	0.0041		0.0129	***
	(1.06)		(5.23)		(0.38)		(8.81)	
WHML	0.0632	***	0.0632	***	0.0632		-0.0666	***
	(3.58)		(17.88)		(0.91)		(-5.53)	
WInvestment	-1.2424	***	-1.2424	***	-1.2424	***	omitted	
	(-15.44)		(-50.92)		(-3.16)			
WProfitability	0.5991	***	0.5991	***	0.5991		omitted	
	(3.98)		(9.93)		(0.96)			
Breusch-Pagan LM test								
Hausman test								
Observations	900		900		900		900	
Multicollinearity (vif)								
Heteroskedasticity (χ^2 - Stat)								
Serial Correlation (F- stat)								
R-Squared	0.2619		0.2619		0.2619		0.9541	
Adjusted R-Squared	0.2578		0.2578		0.2578		0.9539	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	1.0000

Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.0459
N-1	899
N-p-1	896
	0.0461

Results of Panel Data Analysis - 5 Factor Model
Global Financial Crisis - China - International Model

Yes

Dependent Variables

	Pooled OLS		OLS Firm Specific Effects	OLS Time Effects		OLS Firm Specific & Time
Intercept	-0.0677	***	-0.0677	-0.0677		-0.1237
	(-4.11)		(-14.54)	(-1.00)		(-18.96)
DMRP	6.0013	***	6.0013	6.0013	*	omitted
	(8.54)		(28.87)	(1.97)		
DSMB	-3.5234	***	-3.5234	-3.5234	***	omitted
	(-11.37)		(-15.61)	(-2.71)		
DHML	-0.2329		-0.2329	-0.2329		omitted
	(-1.20)		(-2.50)	(-0.21)		
DInvestment	-1.3953	***	-1.3953	-1.3953		omitted
	(-2.93)		(-11.22)	(-0.66)		
DProfitability	0.9574	**	0.9574	0.9574		omitted
	(2.02)		(7.03)	(0.48)		
FMRP	-3.4924	***	-3.4924	-3.4924		omitted
	(-5.55)		(-33.87)	(-1.37)		
FSMB	-0.0065		-0.0065	-0.0065		0.1182
	(-1.63)		(-7.35)	(-0.48)		(7.77)
FHML	0.0719	***	0.0719	0.0719		-0.0683
	(4.40)		(21.72)	(0.84)		(-5.50)
FInvestment	-0.9775	***	-0.9775	-0.9775	***	omitted
	(-11.16)		(-52.54)	(-3.12)		
FProfitability	-0.4390	**	-0.4390	-0.4390		omitted
	(-2.03)		(-15.89)	(-0.52)		
Breusch-Pagan LM test						
Hausman test						
Observations	900		900	900		900
Multicollinearity (vif)						
Heteroskedasticity (χ^2 - Stat)						
Serial Correlation (F- stat)						
R-Squared	0.4613		0.4613	0.4613		0.9541
Adjusted R-Squared	0.4552		0.4552	0.4552		

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	1.0000
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.0459
N-1	899
N-p-1	889
	0.0464

Results of Panel Data Analysis - 5 Factor Model
Global Financial Crisis - China - Domestics Model

Yes

	Dependent Variables Pooled OLS	OLS Firm Specific Effects	OLS Time Effects	OLS Firm Specific & Time
Intercept	-0.0376 **	-0.0376 ***	-0.0376	-0.1220 ***
	(-2.26)	(-8.80)	(-0.52)	(-19.32)
DMRP	1.0835 *	1.0835 ***	1.0835	omitted
	(1.80)	(6.93)	(0.36)	
DSMB	-4.1817 ***	-4.1817 ***	-4.1817 **	omitted
	(-11.63)	(-18.41)	(-2.10)	
DHML	0.1550	0.1550 *	0.1550	omitted
	(0.71)	(1.87)	(0.13)	
DInvestment	-4.5175 ***	-4.5175 ***	-4.5175 **	omitted
	(-9.41)	(-37.86)	(-2.20)	
DProfitability	4.0298 ***	4.0298 ***	4.0298 *	omitted
	(8.61)	(33.39)	(1.93)	
Breusch-Pagan LM test				
Hausman test				
Observations	900	900	900	900
Multicollinearity (vif)				
Heteroskedasticity (χ^2 - Stat)				
Serial Correlation (F- stat)				
R-Squared	0.2227	0.2227	0.2227	0.9541
Adjused R-Squared	0.2183	0.2183	0.2183	0.9538

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	1.0000

Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.0459
N-1	899
N-p-1	894

0.0462

Results of Panel Data Analysis - 5 Factor Model
Global Financial Crisis - Hong Kong - World Model

	Dependent Variables						Yes	
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects		OLS Firm Specific & Time	
Intercept	0.1709	***	0.1709	***	0.1709	***	0.1824	***
	(8.27)		(7.97)		(3.18)		(13.98)	
WMRP	-2.6869	***	-2.6869	***	-2.6869	***	omitted	
	(-7.03)		(-9.23)		(-2.92)			
WSMB	0.0120	***	0.0120	***	0.0120		0.0117	***
	(2.85)		(4.07)		(1.24)		(3.04)	
WHML	0.1025	***	0.1025	***	0.1025	*	-0.2251	***
	(5.37)		(6.08)		(1.94)		(-9.42)	
WInvestment	-1.7746	***	-1.7746	***	-1.7746	***	omitted	
	(-20.41)		(-16.83)		(-6.51)			
WProfitability	0.8129	***	0.8129	***	0.8129	**	omitted	
	(4.99)		(4.00)		(2.04)			
Breusch-Pagan LM test								
Hausman test								
Observations	900		900		900		900	
Multicollinearity (vif)								
Heteroskedasticity (χ^2 - Stat)								
Serial Correlation (F- stat)								
R-Squared	0.4175		0.4175		0.4175		0.5757	
Adjused R-Squared	0.4143		0.4143		0.4143		0.5733	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.0000
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.4243
N-1	899
N-p-1	894
	0.4267

Results of Panel Data Analysis - 5 Factor Model
Global Financial Crisis - Hong Kong - International Model

	Dependent Variables Pooled OLS		OLS Firm Specific Effects		OLS Time Effects		Yes OLS Firm Specific & Time	
Intercept	0.1103	***	0.1103	***	0.1103	**	-0.1821	***
	(4.41)		(4.52)		(2.56)		(-13.89)	
DMRP	-2.5178	***	-2.5178	***	-2.5178		omitted	
	(-2.35)		(-3.84)		(-1.08)			
DSMB	0.0103	**	0.0103	***	0.0103		0.0083	**
	(2.34)		(3.37)		(1.20)		(2.13)	
DHML	0.1150	***	0.1150	***	0.1150	**	-0.2279	***
	(5.91)		(7.36)		(2.41)		(-9.41)	
DInvestment	-1.4352	***	-1.4352	***	-1.4352	***	omitted	
	(-11.25)		(-7.38)		(-3.87)			
DProfitability	-0.6533	***	-0.6533		-0.6533		omitted	
	(-2.37)		(-1.44)		(-1.11)			
FMRP	-1.1675	*	-1.1675	**	-1.1675		omitted	
	(-1.70)		(-1.85)		(-0.72)			
FSMB	-1.2205	***	-1.2205	***	-1.2205		omitted	
	(-3.46)		(-5.23)		(-1.56)			
FHML	-0.0714		-0.0714		-0.0714		omitted	
	(-0.29)		(-0.55)		(-0.13)			
FInvestment	-1.8992	***	-1.8992	***	-1.8992	**	omitted	
	(-4.03)		(-4.51)		(-2.10)			
FProfitability	1.7370	***	1.7370	***	1.7370	**	omitted	
	(4.44)		(5.48)		(2.27)			
Breusch-Pagan LM test								
Hausman test								
Observations	900		900		900		900	
Multicollinearity (vif)								
Heteroskedasticity (χ^2 - Stat)								
Serial Correlation (F- stat)								
R-Squared	0.4541		0.4541		0.4541		0.5757	
Adjusted R-Squared	0.4480		0.4480		0.4480		0.5709	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.0000
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.4243
N-1	899
N-p-1	889
	0.4291

Results of Panel Data Analysis - 5 Factor Model
Global Financial Crisis - Hong Kong - Domestic Model

	Dependent Variables						Yes	
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects		OLS Firm Specific & Time	
Intercept	0.0443	***	0.0443	***	0.0443		-0.1821	***
	(2.69)		(3.53)		(1.37)		(-13.89)	
DMRP	-1.4807	**	-1.4807	***	-1.4807		omitted	
	(-2.00)		(-3.31)		(-1.07)			
DSMB	0.0094	**	0.0094	***	0.0094		0.0083	**
	(2.26)		(2.94)		(0.97)		(2.13)	
DHML	0.0953	***	0.0953	***	0.0953	*	-0.2279	***
	(5.08)		(5.41)		(1.78)		(-9.41)	
DInvestment	-1.7401	***	-1.7401	***	-1.7401	***	omitted	
	(-15.62)		(-10.26)		(-5.95)			
DProfitability	-0.3378		-0.3378		-0.3378		omitted	
	(-1.29)		(-0.76)		(-0.68)			
Breusch-Pagan LM test								
Hausman test								
Observations	900		900		900		900	
Multicollinearity (vif)								
Heteroskedasticity (χ^2 - Stat)								
Serial Correlation (F- stat)								
R-Squared	0.4394		0.4394		0.4394		0.5757	
Adjusted R-Squared	0.4363		0.4363		0.4363		0.5733	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.0000
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.4243
N-1	899
N-p-1	894
	0.4267

Lim, Chee Ming (2017) Noise-augmented asset pricing models:Evidence from the Greater China stock markets during two major financial crises. PhD thesis, University of Nottingham.

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Results of Panel Data Analysis - 3Factor + GlobalINVSENT
Euro Zone Crisis - China

	Dependent Variables							
					Yes			
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects		OLS Firm Specific & Time	
Intercept	-4.9485	***	-4.9485	***	-4.9485	***	-4.1424	***
	(-82.82)		(-191.34)		(-23.03)		(-166.95)	
MRP	18.8987	***	18.8987	***	18.8987	***	omitted	
	(19.98)		(36.36)		(6.23)			
SMB	0.4015		0.4015	*	0.4015		omitted	
	(1.55)		(1.82)		(0.96)			
HML	-0.3755		-0.3755		-0.3755		omitted	
	(-0.80)		(-1.35)		(-0.16)			
GlobalINVSENT	1.0961	***	1.0961	***	1.0961		omitted	
	(2.43)		(12.01)		(0.63)			
Breusch-Pagan LM test								
Hausman test								
Observations	775		775		775		775	
Multicollinearity (vif)								
Heteroskedasticity (χ^2 - Stat)								
Serial Correlation (F- stat)								
R-Squared	0.3630		0.3630		0.3630		0.8704	
Adjused R-Squared	0.3597		0.3597		0.3597		0.8697	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	1.0000
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.

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1-R2	0.1296
N-1	774
N-p-1	770
	0.1303

Results of Panel Data Analysis - 3Factor + GlobalINVSENT
Euro Zone Crisis - Hong Kong

	Dependent Variables				Yes			
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects		OLS Firm Specific & Time	
Intercept	0.0673	***	0.0673	***	0.0673		0.0456	**
	(3.25)		(3.21)		(1.42)		(2.09)	
MRP	-1.1235	***	-1.1235	***	-1.1235		omitted	
	(-3.36)		(-3.93)		(-1.31)			
SMB	0.0920		0.0920		0.0920		omitted	
	(1.33)		(1.15)		(0.36)			
HML	-0.1356		-0.1356		-0.1356		omitted	
	(-1.64)		(-1.16)		(-0.58)			
GlobalINVSENT	0.2724	***	0.2724	**	0.2724	**	omitted	
	(5.29)		(2.15)		(2.51)			
Breusch-Pagan LM test								
Hausman test								
Observations	775		775		775		775	
Multicollinearity (vif)								
Heteroskedasticity (χ^2 - Stat)								
Serial Correlation (F- stat)								
R-Squared	0.0641		0.0641		0.0641		0.2979	
Adjused R-Squared	0.0592		0.0592		0.0592		0.2943	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.1547

Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.7021
N-1	774
N-p-1	770
	0.7057

Results of Panel Data Analysis - 3Factor + GlobalINVSENT
Euro Zone Crisis - Taiwan

	Dependent Variables							
					Yes			
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects		OLS Firm Specific & Time	
Intercept	0.3405	***	0.3405	***	0.3405	**	0.1540	***
	(11.69)		(29.84)		(2.35)		(18.27)	
MRP	-5.0180	***	-5.0180	***	-5.0180	**	omitted	
	(-11.80)		(-30.57)		(-2.39)			
SMB	-0.6910	***	-0.6910	***	-0.6910		omitted	
	(-6.25)		(-16.32)		(-1.15)			
HML	-0.0941		-0.0941		-0.0941		omitted	
	(-1.07)		(-0.95)		(0.20)			
GlobalINVSENT	0.3281	***	0.3281	***	0.3281		omitted	
	(4.40)		(9.78)		(0.75)			
Breusch-Pagan LM test								
Hausman test								
Observations	775		775		775		775	
Multicollinearity (vif)								
Heteroskedasticity (χ^2 - Stat)								
Serial Correlation (F- stat)								
R-Squared	0.2076		0.2076		0.2076		0.8677	
Adjused R-Squared	0.2035		0.2035		0.2035		0.8670	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	1.0000
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.1323
N-1	774
N-p-1	770
	0.1330

Results of Panel Data Analysis - 5 Factor Model
Global Financial Crisis - Taiwan - World Model

	Dependent Variables Pooled OLS	OLS Firm Specific Effects	Yes OLS Time Effects	OLS Firm Specific & Time
Intercept	0.1400 ***	0.1400 ***	0.1400	-0.2758 ***
	(3.95)	(3.89)	(1.63)	(-13.59)
WMRP	-2.2334 ***	-2.2334 ***	-2.2334	5.5974 ***
	(-3.41)	(-2.49)	(-1.41)	(12.84)
WSMB	0.0089	0.0089 *	0.0089	0.0174 ***
	(1.23)	(1.85)	(0.82)	(6.83)
WHML	0.0306	0.0306 ***	0.0306	-0.1059 ***
	(0.94)	(5.79)	(0.56)	(-14.38)
WInvestment	-1.2713 ***	-1.2713 ***	-1.2713 ***	-0.0718
	(-8.53)	(-3.71)	(-3.73)	(-0.78)
WProfitability	1.1647 ***	1.1647 ***	1.1647 *	-1.0700 ***
	(4.17)	(2.75)	(1.87)	(-7.10)
Breusch-Pagan LM test				
Hausman test				
Observations	900	900	900	900
Multicollinearity (vif)				
Heteroskedasticity (χ^2 - Stat)				
Serial Correlation (F- stat)				
R-Squared	0.0966	0.0966	0.0966	0.2718
Adjusted R-Squared	0.0915	0.0915	0.0915	0.2677

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.2038

Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.7282
N-1	899
N-p-1	894
	0.7323

Results of Panel Data Analysis - 5 Factor Model
Global Financial Crisis - Taiwan - International Model

	Dependent Variables				Yes			
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects		OLS Firm Specific & Time	
Intercept	0.1506	***	0.1506	***	0.1506	*	-0.1566	***
	(4.61)		(17.65)		(1.78)		(-17.03)	
DMRP	omitted		omitted		omitted		omitted	
DSMB	-1.8332		-1.8332		-1.8332		omitted	
	(-1.00)		(-1.81)		(-0.44)			
DHML	-0.8178		-0.8178		-0.8178		omitted	
	(-0.46)		(-0.76)		(-0.19)			
DInvestment	-3.4155	**	-3.4155	***	-3.4155		omitted	
	(-2.33)		(-2.55)		(-1.28)			
DProfitability	-1.2556		-1.2556	**	-1.2556		omitted	
	(-0.65)		(-2.29)		(-0.37)			
FMRP	-2.8022	***	-2.8022	***	-2.8022		omitted	
	(-3.89)		(-14.22)		(-1.61)			
FSMB	0.0096		0.0096	***	0.0096		omitted	
	(1.28)		(4.86)		(0.85)			
FHML	0.0304		0.0304	***	0.0304		omitted	
	(0.92)		(3.75)		(0.61)			
FInvestment	-1.0394	***	-1.0394	***	-1.0394	***	omitted	
	(-5.94)		(-22.53)		(-2.78)			
FProfitability	1.0613	***	1.0613	***	1.0613	*	omitted	
	(3.55)		(23.10)		(1.66)			
Breusch-Pagan LM test								
Hausman test								
Observations	900		900		900		900	
Multicollinearity (vif)								
Heteroskedasticity (χ^2 - Stat)								
Serial Correlation (F- stat)								
R-Squared	0.1170		0.1170		0.1170			
Adjused R-Squared	0.1081		0.1081		0.1081			

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.2670
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2
N-1
N-p-1

Results of Panel Data Analysis - 5 Factor Model
Global Financial Crisis - Taiwan - Domestics Model

	Dependent Variables				Yes		
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects	OLS Firm Specific & Time	
Intercept	0.0177	*	0.0177	***	0.0177	-0.1528	***
	(1.91)		(8.89)		(0.81)	(-16.73)	
DMRP	omitted		omitted		omitted	omitted	
DSMB	-4.6799	***	-4.6799	***	-4.6799	omitted	
	(-2.57)		(-4.74)		(-0.93)		
DHML	-1.3886		-1.3886		-1.3886	omitted	
	(-0.78)		(-1.23)		(-0.30)		
DInvestment	-4.1648	***	-4.1648	***	-4.1648	omitted	
	(-2.80)		(-3.01)		(-1.35)		
DProfitability	0.5064		0.5064		0.5064	omitted	
	(0.26)		(0.94)		(0.10)		
Breusch-Pagan LM test							
Hausman test							
Observations	900		900		900	900	
Multicollinearity (vif)							
Heteroskedasticity (χ^2 - Stat)							
Serial Correlation (F- stat)							
R-Squared	0.0449		0.0449		0.0449	0.2803	
Adjusted R-Squared	0.0406		0.0406		0.0406	0.2763	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.3607
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.7197
N-1	899
N-p-1	894
	0.7237

Results of Panel Data Analysis - 5 Factor Model
Euro Zone Crisis - China - World Model

	Dependent Variables Pooled OLS		OLS Firm Specific Effects		Yes OLS Time Effects	OLS Firm Specific & Time	
Intercept	-5.4094	***	-5.4094	***	-5.4094	-4.1424	***
	(-68.21)		(-104.59)		(15.20)	(-166.95)	
WMRP	26.4532	***	26.4532	***	26.4532	omitted	
	(21.24)		(29.79)		(4.96)		
WSMB	0.8722	*	0.8722	**	0.8722	omitted	
	(1.90)		(1.98)		(0.54)		
WHML	1.0170	*	1.0170	***	1.0170	omitted	
	(1.98)		(4.63)		(0.42)		
WInvestment	-1.8316	***	-1.8316	***	-1.8316	omitted	
	(-3.12)		(-9.44)		(-0.81)		
WProfitability	-1.0092	***	-1.0092	***	-1.0092	omitted	
	(-3.43)		(-13.07)		(-0.58)		
Breusch-Pagan LM test							
Hausman test							
Observations	775		775		775	775	
Multicollinearity (vif)							
Heteroskedasticity (χ^2 - Stat)							
Serial Correlation (F- stat)							
R-Squared	0.4158		0.4158		0.4158	0.8704	
Adjusted R-Squared	0.4120		0.4120		0.4120	0.8696	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	1.0000
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.1296
N-1	774
N-p-1	769
	0.1304

Results of Panel Data Analysis - 5 Factor Model
Euro Zone Crisis - China - International Model

	Dependent Variables				Yes		
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects		OLS Firm Specific & Time
Intercept	-5.3872	***	-5.3872	***	-5.3872		-4.1424
	(-55.21)		(-71.32)		(-13.31)		(-166.95)
DMRP	11.1585	***	11.1585	***	11.1585		omitted
	(3.93)		(13.66)		(0.77)		
DSMB	2.0773	***	2.0773	***	2.0773		omitted
	(2.51)		(3.01)		(0.59)		
DHML	4.6390	***	4.6390	***	4.6390		omitted
	(3.57)		(5.79)		(0.70)		
DInvestment	-3.2798	*	-3.2798	***	-3.2798		omitted
	(-1.66)		(-7.88)		(-0.34)		
DProfitability	-2.8004	***	-2.8004	***	-2.8004		omitted
	(-5.31)		(-11.09)		(-1.09)		
FMRP	45.1145	***	45.1145	***	45.1145	**	omitted
	(11.61)		(18.74)		(2.26)		
FSMB	1.4981		1.4981	***	1.4981		omitted
	(1.58)		(2.63)		(0.36)		
FHML	1.5048		1.5048	***	1.5048		omitted
	(1.60)		(7.86)		(0.48)		
FInvestment	-2.5981	***	-2.5981	***	-2.5981		omitted
	(-3.95)		(-13.07)		(-1.19)		
FProfitability	-0.4073		-0.4073		-0.4073		omitted
	(-0.34)		(-1.04)		(-0.06)		
Breusch-Pagan LM test							
Hausman test							
Observations	775		775		775		775
Multicollinearity (vif)							
Heteroskedasticity (χ^2 - Stat)							
Serial Correlation (F- stat)							
R-Squared	0.3601		0.3601		0.3601		0.8704
Adjused R-Squared	0.3517		0.3517		0.3517		0.8687

Test for the presence of fixed firm effect		
Fixed Effect Model - F test (p-value)	1.0000	
Test for the presence of time effect		
Time Dummies - F test (p-value)	0.0000	

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.1296
N-1	774
N-p-1	764
	0.1313

Results of Panel Data Analysis - 5 Factor Model
Euro Zone Crisis - China - Domestic Model

	Dependent Variables					Yes		
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects		OLS Firm Specific & Time	
Intercept	-4.8131	***	-4.8131	***	-4.8131	***	-4.1424	***
	(-61.88)		(-146.25)		(-14.25)		(-166.95)	
DMRP	32.5581	***	32.5581	***	32.5581	***	omitted	
	(13.04)		(26.87)		(2.78)			
DSMB	1.9221	***	1.9221	***	1.9221		omitted	
	(2.99)		(4.59)		(0.74)			
DHML	3.1378	***	3.1378	***	3.1378		omitted	
	(2.50)		(4.82)		(0.45)			
DInvestment	-1.4273		-1.4273	***	-1.4273		omitted	
	(-0.70)		(-4.76)		(-0.13)			
DProfitability	-1.3192	***	-1.3192	***	-1.3192		omitted	
	(-2.81)		(-10.00)		(-0.48)			
Breusch-Pagan LM test								
Hausman test								
Observations	775		775		775		775	
Multicollinearity (vif)								
Heteroskedasticity (χ^2 - Stat)								
Serial Correlation (F- stat)								
R-Squared	0.2067		0.2067		0.2067		0.8704	
Adjusted R-Squared	0.2015		0.2015		0.2015		0.8696	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	1.0000

Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.1296
N-1	774
N-p-1	769
	0.1304

Lim, Chee Ming (2017) Noise-augmented asset pricing models:Evidence from the Greater China stock markets during two major financial crises. PhD thesis, University of Nottingham.

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Results of Panel Data Analysis - 3Factor + GlobalINVSENT
Euro Zone Crisis - China

	Dependent Variables				Yes			
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects		OLS Firm Specific & Time	
Intercept	-4.9485	***	-4.9485	***	-4.9485	***	-4.1424	***
	(-82.82)		(-191.34)		(-23.03)		(-166.95)	
MRP	18.8987	***	18.8987	***	18.8987	***	omitted	
	(19.98)		(36.36)		(6.23)			
SMB	0.4015		0.4015	*	0.4015		omitted	
	(1.55)		(1.82)		(0.96)			
HML	-0.3755		-0.3755		-0.3755		omitted	
	(-0.80)		(-1.35)		(-0.16)			
GlobalINVSENT	1.0961	***	1.0961	***	1.0961		omitted	
	(2.43)		(12.01)		(0.63)			
Breusch-Pagan LM test								
Hausman test								
Observations	775		775		775		775	
Multicollinearity (vif)								
Heteroskedasticity (χ^2 - Stat)								
Serial Correlation (F- stat)								
R-Squared	0.3630		0.3630		0.3630		0.8704	
Adjused R-Squared	0.3597		0.3597		0.3597		0.8697	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	1.0000
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.1296
N-1	774
N-p-1	770
	0.1303

Results of Panel Data Analysis - 3Factor + GlobalINVSENT
Euro Zone Crisis - Hong Kong

	Dependent Variables			
			Yes	
	Pooled OLS	OLS Firm Specific Effects	OLS Time Effects	OLS Firm Specific & Time
Intercept	0.0673 ***	0.0673 ***	0.0673	0.0456 **
	(3.25)	(3.21)	(1.42)	(2.09)
MRP	-1.1235 ***	-1.1235 ***	-1.1235	omitted
	(-3.36)	(-3.93)	(-1.31)	
SMB	0.0920	0.0920	0.0920	omitted
	(1.33)	(1.15)	(0.36)	
HML	-0.1356	-0.1356	-0.1356	omitted
	(-1.64)	(-1.16)	(-0.58)	
GlobalINVSENT	0.2724 ***	0.2724 **	0.2724 **	omitted
	(5.29)	(2.15)	(2.51)	
Breusch-Pagan LM test				
Hausman test				
Observations	775	775	775	775
Multicollinearity (vif)				
Heteroskedasticity (χ^2 - Stat)				
Serial Correlation (F- stat)				
R-Squared	0.0641	0.0641	0.0641	0.2979
Adjused R-Squared	0.0592	0.0592	0.0592	0.2943

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.1547
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.7021
N-1	774
N-p-1	770
	0.7057

Results of Panel Data Analysis - 3Factor + GlobalINVSENT
Euro Zone Crisis - Taiwan

	Dependent Variables				Yes			
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects		OLS Firm Specific & Time	
Intercept	0.3405	***	0.3405	***	0.3405	**	0.1540	***
	(11.69)		(29.84)		(2.35)		(18.27)	
MRP	-5.0180	***	-5.0180	***	-5.0180	**	omitted	
	(-11.80)		(-30.57)		(-2.39)			
SMB	-0.6910	***	-0.6910	***	-0.6910		omitted	
	(-6.25)		(-16.32)		(-1.15)			
HML	-0.0941		-0.0941		-0.0941		omitted	
	(-1.07)		(-0.95)		(0.20)			
GlobalINVSENT	0.3281	***	0.3281	***	0.3281		omitted	
	(4.40)		(9.78)		(0.75)			
Breusch-Pagan LM test								
Hausman test								
Observations	775		775		775		775	
Multicollinearity (vif)								
Heteroskedasticity (χ^2 - Stat)								
Serial Correlation (F- stat)								
R-Squared	0.2076		0.2076		0.2076		0.8677	
Adjused R-Squared	0.2035		0.2035		0.2035		0.8670	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	1.0000
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{\text{adjusted}} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.1323
N-1	774
N-p-1	770
	0.1330

Results of Panel Data Analysis - 5 Factor Model

Euro Zone Crisis - Hong Kong - World Model

Yes

	Dependent Variables							
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects		OLS Firm Specific & Time	
Intercept	-0.0103		-0.0103		-0.0103		0.0456	**
	(-0.40)		(-0.54)		(-0.16)		(2.09)	
WMRP	0.1946		0.1946		0.1946		omitted	
	(0.48)		(0.74)		(0.19)			
WSMB	-0.1766		-0.1766		-0.1766		omitted	
	(-1.19)		(-0.88)		(-0.45)			
WHML	0.6350	***	0.6350	***	0.6350		omitted	
	(3.82)		(3.05)		(1.24)			
WInvestment	-0.3147		-0.3147		-0.3147		omitted	
	(-1.65)		(-0.96)		(-0.46)			
WProfitability	-0.5919	***	-0.5919	***	-0.5919	***	omitted	
	(-6.21)		(-7.77)		(-2.36)			
Breusch-Pagan LM test								
Hausman test								
Observations	775		775		775		775	
Multicollinearity (vif)								
Heteroskedasticity (χ^2 - Stat)								
Serial Correlation (F- stat)								
R-Squared	0.0732		0.0732		0.0732		0.2979	
Adjusted R-Squared	0.0672		0.0672		0.0672		0.2933	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.1470
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1- \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where

R^2 = sample R-square

p = Number of predictors

N = Total sample size.

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1-R2	0.7021
N-1	774
N-p-1	769
	0.7067

Results of Panel Data Analysis - 5 Factor Model
Euro Zone Crisis - Hong Kong - International Model

	Dependent Variables				Yes			
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects		OLS Firm Specific & Time	
Intercept	0.0350		0.0350	*	0.0350		0.0456	***
	(1.60)		(1.78)		(0.78)		(2.09)	
DMRP	2.8919	**	2.8919	***	2.8919		omitted	
	(2.04)		(3.66)		(0.83)			
DSMB	0.7057	***	0.7057	***	0.7057		omitted	
	(2.99)		(2.52)		(1.27)			
DHML	-0.3747		-0.3747		-0.3747		omitted	
	(-1.41)		(-0.98)		(-0.70)			
DInvestment	-0.2524		-0.2524		-0.2524		omitted	
	(-1.28)		(-0.69)		(-0.58)			
DProfitability	-0.9052	***	-0.9052	***	-0.9052	***	omitted	
	(-6.30)		(-8.57)		(-2.90)			
FMRP	-1.6900	**	-1.6900	***	-1.6900		omitted	
	(-1.97)		(-2.39)		(-0.92)			
FSMB	1.0127	***	1.0127	***	1.0127	***	omitted	
	(4.13)		(3.97)		(2.76)			
FHML	3.1186	***	3.1186	***	3.1186	***	omitted	
	(8.04)		(11.16)		(4.45)			
FInvestment	-3.2095	***	-3.2095	***	-3.2095	***	omitted	
	(-5.00)		(-7.88)		(-2.69)			
FProfitability	omitted		omitted		omitted		omitted	
Breusch-Pagan LM test								
Hausman test								
Observations	775		775		775		775	
Multicollinearity (vif)								
Heteroskedasticity (χ^2 - Stat)								
Serial Correlation (F- stat)								
R-Squared	0.1336		0.1336		0.1336		0.2979	
Adjused R-Squared	0.1234		0.1234		0.1234		0.2887	

Test for the presence of fixed firm effect
Fixed Effect Model - F test (p-value) 0.0982

Test for the presence of time effect
Time Dummies - F test (p-value) 0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.7021
N-1	774
N-p-1	764
	0.7113

Results of Panel Data Analysis - 5 Factor Model
Euro Zone Crisis - Hong Kong - Domestic Model

	Dependent Variables		Yes	
	Pooled OLS	OLS Firm Specific Effects	OLS Time Effects	OLS Firm Specific & Time
Intercept	0.0163	0.0163	0.0163	0.0456 **
	(0.83)	(0.81)	(0.35)	(2.13)
DMRP	-0.6592	-0.6592	-0.6592	omitted
	(-0.76)	(-0.87)	(-0.32)	
DSMB	0.2729	0.2729	0.2729	omitted
	(1.29)	(1.32)	(0.48)	
DHML	-0.4137	-0.4137	-0.4137	omitted
	(-1.59)	(-1.17)	(-0.61)	
DInvestment	-0.5496 ***	-0.5496	-0.5496	omitted
	(-2.80)	(-1.45)	(-0.97)	
DProfitability	-0.5084 ***	-0.5084 ***	-0.5084 *	omitted
	(-4.58)	(-5.97)	(-1.65)	
Breusch-Pagan LM test				
Hausman test				
Observations	775	775	775	775
Multicollinearity (vif)				
Heteroskedasticity (χ^2 - Stat)				
Serial Correlation (F- stat)				
R-Squared	0.0504	0.0504	0.0504	0.2979
Adjused R-Squared	0.0443	0.0443	0.0443	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.1696
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.7021
N-1	774
N-p-1	769
	0.7067

Results of Panel Data Analysis - 5 Factor Model
Euro Zone Crisis - Taiwan - World Model

Yes

Dependent Variables

	Pooled OLS	OLS Firm Specific Effects	OLS Time Effects	OLS Firm Specific & Time
Intercept	-0.0042	-0.0042	-0.0042	0.1540 ***
	(-0.30)	(-0.74)	(-0.06)	(18.27)
WMRP	-0.0358	-0.0358	-0.0358	omitted
	(-0.16)	(-0.42)	(-0.03)	
WSMB	-0.2874 ***	-0.2874 ***	-0.2874	omitted
	(-3.52)	(-7.69)	(-0.67)	
WHML	1.0009 ***	1.0009 ***	1.0009 **	omitted
	(10.96)	(32.14)	(2.06)	
WInvestment	-0.5497 ***	-0.5497 ***	-0.5497	omitted
	(-5.26)	(-13.01)	(-1.02)	
WProfitability	-0.5158 ***	-0.5158 ***	-0.5158 ***	omitted
	(-9.85)	(-19.05)	(-2.62)	
Breusch-Pagan LM test				
Hausman test				
Observations	775	775	775	775
Multicollinearity (vif)				
Heteroskedasticity (χ^2 - Stat)				
Serial Correlation (F- stat)				
R-Squared	0.2565	0.2565	0.2565	0.8677
Adjusted R-Squared	0.2517	0.2517	0.2517	0.8668

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.9999
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.1323
N-1	774
N-p-1	769
	0.1332

Results of Panel Data Analysis - 5 Factor Model
Euro Zone Crisis - Taiwan - International Model

	Dependent Variables						Yes	
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects		OLS Firm Specific & Time	
Intercept	-0.0565	***	-0.0565	***	-0.0565		0.1540	***
	(-3.78)		(-5.19)		(-1.54)		(18.27)	
DMRP	6.6653	***	6.6653	***	6.6653	*	omitted	
	(4.52)		(6.93)		(1.79)			
DSMB	9.2336	***	9.2336	***	9.2336	***	omitted	
	(8.43)		(22.32)		(3.03)			
DHML	-0.9241		-0.9241		-0.9241		omitted	
	(-1.12)		(-0.97)		(-0.55)			
DInvestment	-1.8659	***	-1.8659	***	-1.8659		omitted	
	(-2.61)		(-4.78)		(-0.85)			
DProfitability	-2.9369	***	-2.9369	***	-2.9369		omitted	
	(-3.91)		(-9.53)		(-0.91)			
FMRP	-0.2982		-0.2982	***	-0.2982		omitted	
	(-1.44)		(-4.24)		(-0.29)			
FSMB	-0.1829	**	-0.1829	***	-0.1829		omitted	
	(-2.20)		(-6.93)		(-0.42)			
FHML	0.8838	***	0.8838	***	0.8838		omitted	
	(8.23)		(22.26)		(1.64)			
FInvestment	-0.4596	***	-0.4596	***	-0.4596		omitted	
	(-4.35)		(-11.05)		(-0.85)			
FProfitability	-0.4271	***	-0.4271	***	-0.4271	**	omitted	
	(-8.66)		(-15.06)		(-2.53)			
Breusch-Pagan LM test								
Hausman test								
Observations	775		775		775		775	
Multicollinearity (vif)								
Heteroskedasticity (χ^2 - Stat)								
Serial Correlation (F- stat)								
R-Squared	0.3780		0.3780		0.3780		0.8677	
Adjused R-Squared	0.3699		0.3699		0.3699		0.8660	

Test for the presence of fixed firm effect
Fixed Effect Model - F test (p-value) 0.9997

Test for the presence of time effect
Time Dummies - F test (p-value) 0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.1323
N-1	774
N-p-1	764
	0.134032

Results of Panel Data Analysis - 5 Factor Model
Euro Zone Crisis - Taiwan - Domestics Model

			Yes	
	Dependent Variables			
	Pooled OLS	OLS Firm Specific Effects	OLS Time Effects	OLS Firm Specific & Time
Intercept	-0.0640 ***	-0.0640 ***	-0.0640	-0.1540 ***
	(-4.41)	(-6.36)	(0.00)	(18.27)
DMRP	6.2653 ***	6.2653 ***	6.2653 ***	omitted
	(4.22)	(6.31)	(3.86)	
DSMB	11.2044 ***	11.2044 ***	11.2044 ***	omitted
	(10.01)	(25.52)	(5.80)	
DHML	-3.7219 ***	-3.7219 ***	-3.7219 ***	omitted
	(-4.26)	(-4.08)	(-3.18)	
DInvestment	-3.1135 ***	-3.1135 ***	-3.1135	omitted
	(-4.09)	(-8.50)	(-1.17)	
DProfitability	-2.3794 ***	-2.3794 ***	-2.3794	omitted
	(-3.42)	(-10.51)	(-0.72)	
Breusch-Pagan LM test				
Hausman test				
Observations	775	775	775	775
Multicollinearity (vif)				
Heteroskedasticity (χ^2 - Stat)				
Serial Correlation (F- stat)				
R-Squared	0.1993	0.1993	0.1993	0.8677
Adjusted R-Squared	0.1940	0.1940	0.1940	0.8668

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	1.0000
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.1323
N-1	774
N-p-1	769
	0.1332

Results of Panel Data Analysis - 3Factor + GlobalINVSENT
Global Financial Crisis - China - Small Market Capitalisation

	Dependent Variables				
				Yes	
	Pooled OLS	OLS Firm Specific Effects	OLS Time Effects	OLS Firm Specific & Time
Intercept	0.0548 *	0.0548 ***	0.0548	-0.0520 ***
	(1.79)	(5.36)	(0.82)	(-4.81)
MRP	-0.3942	-0.3942 **	-0.3942	omitted
	(-0.64)	(-2.05)	(-0.27)	
SMB	-1.1461 ***	-1.1461 ***	-1.1461 ***	omitted
	(-6.17)	(-4.97)	(-2.75)	
HML	0.3929 ***	0.3929 ***	0.3929 ***	omitted
	(4.28)	(2.40)	(3.45)	
GlobalINVSENT	0.2387	0.2387 ***	0.2387	omitted
	(1.41)	(8.79)	(0.99)	
Breusch-Pagan LM test				
Hausman test				
Observations	180	180	180	180
Multicollinearity (vif)				
Heteroskedasticity (χ^2 - Stat)				
Serial Correlation (F- stat)				
R-Squared	0.2049	0.2049	0.2049	0.8988
Adjused R-Squared	0.1867	0.1867	0.1867	0.8965
Test for the presence of fixed firm effect				
Fixed Effect Model - F test (p-value)	0.9547			
Test for the presence of time effect				
Time Dummies - F test (p-value)	0.0000			
			1-R2	0.1012
			N-1	179
			N-p-1	175
				0.103513

Results of Panel Data Analysis - 3Factor + GlobalINVSENT

Global Financial Crisis - Hong Kong - Small Market Capitalisation

	Dependent Variables Pooled OLS		OLS Firm Specific Effects		OLS Time Effects (Yes)		OLS Firm Specific & Time	
Intercept	0.1616	***	0.1616	***	0.1616	***	-0.1100	***
	(4.50)		(7.44)		(3.08)		(-5.35)	
MRP	-2.1796	***	-2.1796	***	-2.1796	**	omitted	
	(-3.68)		(-7.42)		(-2.11)			
SMB	-0.0042		-0.0042		-0.0042		omitted	
	(-0.03)		(-0.02)		(-0.01)			
HML	-0.1700		-0.1700	***	-0.1700		omitted	
	(-1.47)		(-4.91)		(-0.63)			
GlobalINVSENT	0.1877		0.1877		0.1877		omitted	
	(1.25)		(1.51)		(0.74)			
Breusch-Pagan LM test								
Hausman test								
Observations	180		180		180		180	
Multicollinearity (vif)								
Heteroskedasticity (χ^2 - Stat)								
Serial Correlation (F- stat)								
R-Squared	0.1156		0.1156		0.1156		0.7885	
Adjused R-Squared	0.0954		0.0954		0.0954		0.7837	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.1518
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where

R^2 = sample R-square

p = Number of predictors

N = Total sample size.

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1-R2	0.2115
N-1	179
N-p-1	175
	0.2163

Results of Panel Data Analysis - 3Factor + GlobalINVSENT
Global Financial Crisis - Taiwan - Small Market Capitalisation

	Dependent Variables						Yes	
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects		OLS Firm Specific & Time	
Intercept	0.0241		0.0241		0.0241		0.1662	***
	(0.80)		(0.77)		(1.19)		(6.53)	
MRP	-0.0448		-0.0448		-0.0448		0.4695	
	(-0.09)		(-0.08)		(-0.12)		(1.31)	
SMB	-0.6003	***	-0.6003	***	-0.6003	***	0.2724	
	(-3.52)		(-3.30)		(-2.89)		(1.20)	
HML	0.7985	***	0.7985	***	0.7985	***	omitted	
	(-4.61)		(-10.18)		(-3.88)			
GlobalINVSENT	-0.2599		-0.2599	***	-0.2599		omitted	
	(-0.91)		(-6.70)		(-0.79)			
Breusch-Pagan LM test								
Hausman test								
Observations	180		180		180		180	
Multicollinearity (vif)								
Heteroskedasticity (χ^2 - Stat)								
Serial Correlation (F- stat)								
R-Squared	0.1980		0.1980		0.1980		0.4221	
Adjused R-Squared	0.1797		0.1797		0.1797		0.4089	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.0093
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0002

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.5779
N-1	179
N-p-1	175
	0.5911

Results of Panel Data Analysis - 3Factor + GlobalINVSENT
Global Financial Crisis - China - Big Market Capitalisation

	Dependent Variables Pooled OLS	OLS Firm Specific Effects	OLS Time Effects (Yes)	OLS Firm Specific & Time
Intercept	0.0303	0.0303 ***	0.0303	-0.0580 ***
	(0.90)	(12.45)	(0.40)	(-3.94)
MRP	-0.4005	-0.4005 ***	-0.4005	omitted
	(-0.60)	(-9.26)	(-0.25)	
SMB	0.2676	0.2676	0.2676	omitted
	(0.92)	(1.62)	(0.45)	
HML	0.0211	0.0211	0.0211	omitted
	(0.07)	(1.01)	(0.03)	
GlobalINVSENT	0.0987	0.0987 ***	0.0987	omitted
	(0.54)	(12.16)	(0.43)	
Breusch-Pagan LM test				
Hausman test				
Observations	180	180	180	180
Multicollinearity (vif)				
Heteroskedasticity (χ^2 - Stat)				
Serial Correlation (F- stat)				
R-Squared	0.0152	0.0152	0.0152	0.9755
Adjused R-Squared	-0.0073	-0.0073	-0.0073	0.9749

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.9864

Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.0245
N-1	179
N-p-1	175
	0.0251

Results of Panel Data Analysis - 3Factor + GlobalINVSENT

Global Financial Crisis - Hong Kong - Big Market Capitalisation Yes

	Dependent Variables						
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects	OLS Firm Specific & Time	
Intercept	0.1167	***	0.1167	***	0.1167	-0.1598	***
	(3.04)		(13.12)		(1.52)	(-24.76)	
MRP	-1.4789	**	-1.4789	***	-1.4789	omitted	
	(-2.25)		(-13.34)		(-1.04)		
SMB	-0.0514		-0.0514		-0.0514	3.6250	
	(-0.60)		(-0.26)		(-0.24)	(13.01)	
HML	0.3066	*	0.3066	***	0.3066	omitted	
	(1.92)		(2.88)		(0.79)		
GlobalINVSENT	0.2398		0.2398	***	0.2398	omitted	
	(1.41)		(4.58)		(0.82)		
Breusch-Pagan LM test							
Hausman test							
Observations	180		180		180	180	
Multicollinearity (vif)							
Heteroskedasticity (χ^2 - Stat)							
Serial Correlation (F- stat)							
R-Squared	0.0741		0.0741		0.0741	0.8376	
Adjused R-Squared	0.0529		0.0529		0.0529	0.8339	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.9864
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where

R^2 = sample R-square

p = Number of predictors

N = Total sample size.

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1-R2	0.1624
N-1	179
N-p-1	175
	0.1661

Results of Panel Data Analysis - 3Factor + GlobalINVSENT
Global Financial Crisis - Taiwan - Big Market Capitalisation

	Dependent Variables				Yes			
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects		OLS Firm Specific & Time	
Intercept	0.0247		0.0247	*	0.0247		-0.1399	***
	(1.44)		(1.77)		(1.26)		(-8.50)	
MRP	-0.2232		-0.2232		-0.2232		-0.0030	
	(-0.76)		(-1.06)		(-0.92)		(-0.17)	
SMB	1.1725	***	1.1725	***	1.1725	***	omitted	
	(7.22)		(7.03)		(3.75)			
HML	-0.5447	***	-0.5447	***	-0.5447		omitted	
	(-2.61)		(-15.89)		(-1.29)			
GlobalINVSENT	-0.1506		-0.1506	***	-0.1506		omitted	
	(-0.91)		(-4.18)		(-0.43)			
Breusch-Pagan LM test								
Hausman test								
Observations	180		180		180		180	
Multicollinearity (vif)								
Heteroskedasticity (χ^2 - Stat)								
Serial Correlation (F- stat)								
R-Squared	0.2563		0.2563		0.2563		0.9677	
Adjused R-Squared	0.2393		0.2393		0.2393		0.9668	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.2989
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.0323
N-1	179
N-p-1	174
	0.0332

Results of Panel Data Analysis - 3Factor + GlobalINVSENT
Euro Zone Crisis - China - Small Market Capitalisation

	Dependent Variables				Yes			
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects		OLS Firm Specific & Time	
Intercept	0.0226		0.0226	***	0.0226		0.0420	***
	(1.17)		(23.10)		(0.64)		(10.07)	
MRP	0.0543		0.0543	***	0.0543		omitted	
	(0.17)		(2.45)		(0.09)			
SMB	-1.2493	***	-1.2493	***	-1.2493	**	omitted	
	(-6.89)		(-7.08)		(-2.32)			
HML	-0.3838	***	-0.3838	***	-0.3838		omitted	
	(-2.75)		(-17.24)		(-1.00)			
GlobalINVSENT	-0.1780		-0.1780	***	-0.1780		omitted	
	(-1.24)		(-6.49)		(-0.71)			
Breusch-Pagan LM test								
Hausman test								
Observations	145		145		145		145	
Multicollinearity (vif)								
Heteroskedasticity (χ^2 - Stat)								
Serial Correlation (F- stat)								
R-Squared	0.3644		0.3644		0.3644		0.9644	
Adjused R-Squared	0.3462		0.3462		0.3462		0.9634	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.9642
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1- \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.0356
N-1	144
N-p-1	140

0.036617

Results of Panel Data Analysis - 3Factor + GlobalINVSENT
Euro Zone Crisis - Hong Kong - Small Market Capitalisation

	Dependent Variables						
					Yes		
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects		OLS Firm Specific & Time
Intercept	0.1155	***	0.1155	***	0.1155	***	0.0960
	(3.09)		(13.23)		(2.66)		(1.75)
MRP	-1.6286	***	-1.6286	***	-1.6286	**	omitted
	(-2.85)		(-10.78)		(-2.29)		
SMB	0.0082		0.0082		0.0082		omitted
	(0.13)		(0.04)		(0.11)		
HML	-0.2982	***	-0.2982	***	-0.2982	**	omitted
	(-2.68)		(-2.74)		(-2.37)		
GlobalINVSENT	0.3686	***	0.3686	***	0.3686	***	omitted
	(3.55)		(15.74)		(2.81)		
Breusch-Pagan LM test							
Hausman test							
Observations	155		155		155		155
Multicollinearity (vif)							
Heteroskedasticity (χ^2 - Stat)							
Serial Correlation (F- stat)							
R-Squared	0.2598		0.2598		0.2598		0.5314
Adjused R-Squared	(0.2400)		(0.2400)		(0.2400)		0.5189

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.0571
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.4686
N-1	154
N-p-1	150
	0.4811

Results of Panel Data Analysis - 3Factor + GlobalINVSENT
Euro Zone Crisis - Taiwan - Small Market Capitalisation

	Dependent Variables				Yes			
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects		OLS Firm Specific & Time	
Intercept	0.3219	***	0.3219	***	0.3219	**	0.1940	**
	(5.28)		(19.02)		(2.07)		(13.51)	
MRP	-4.4247	***	-4.4247	***	-4.4247	**	omitted	
	(-4.90)		(-18.98)		(-1.96)			
SMB	-0.5422	***	-0.5422	***	-0.5422	***	omitted	
	(-5.28)		(-3.07)		(-2.80)			
HML	0.1260		0.1260	***	0.1260		omitted	
	(0.94)		(3.77)		(0.44)			
GlobalINVSENT	0.2011		0.2011	***	0.2011		omitted	
	(1.30)		(3.68)		(0.51)			
Breusch-Pagan LM test								
Hausman test								
Observations	155		155		155		155	
Multicollinearity (vif)								
Heteroskedasticity (χ^2 - Stat)								
Serial Correlation (F- stat)								
R-Squared	0.3164		0.3164		0.3164		0.8959	
Adjused R-Squared	0.2982		0.2982		0.2982		0.8931	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.5993
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.1041
N-1	154
N-p-1	150
	0.1069

Results of Panel Data Analysis - 3Factor + GlobalINVSENT
Euro Zone Crisis - China - Big Market Capitalisation

	Dependent Variables				Yes			
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects		OLS Firm Specific & Time	
Intercept	0.0138		0.0138	***	0.0138		0.0200	**
	(0.62)		(8.96)		(0.38)		(2.54)	
MRP	-0.1707		-0.1707	***	-0.1707		omitted	
	(-0.48)		(-5.79)		(-0.32)			
SMB	0.6190	***	0.6190	***	0.6190	***	omitted	
	(4.72)		(3.38)		(2.91)			
HML	0.6484	***	0.6484	***	0.6484	***	omitted	
	(5.52)		(59.56)		(4.31)			
GlobalINVSENT	-0.0925		-0.0925	***	-0.0925		omitted	
	(-0.57)		(-3.94)		(-0.32)			
Breusch-Pagan LM test								
Hausman test								
Observations	145		145		145		145	
Multicollinearity (vif)								
Heteroskedasticity (χ^2 - Stat)								
Serial Correlation (F- stat)								
R-Squared	0.2120		0.2120		0.2120		0.9333	
Adjused R-Squared	0.1895		0.1895		0.1895			

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.9960
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.0667
N-1	144
N-p-1	141
	0.0681

Results of Panel Data Analysis - 3Factor + GlobalINVSENT
Euro Zone Crisis - Hong Kong - Big Market Capitalisation

	Dependent Variables							
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects		OLS Firm Specific & Time	
Intercept	0.0575	**	0.0575	***	0.0575		0.0480	***
	(2.00)		(3.15)		(1.20)		(4.03)	
MRP	-0.8439	*	-0.8439	***	-0.8439		omitted	
	(-1.77)		(-2.87)		(-0.91)			
SMB	0.0404		0.0404		0.0404		omitted	
	(0.40)		(0.22)		(0.19)			
HML	0.2962	***	0.2962	**	0.2962	***	omitted	
	(5.20)		(2.29)		(3.27)			
GlobalINVSENT	0.1925	***	0.1925	***	0.1925	**	omitted	
	(2.51)		(10.97)		(1.99)			
Breusch-Pagan LM test								
Hausman test								
Observations	155		155		155		155	
Multicollinearity (vif)								
Heteroskedasticity (χ^2 - Stat)								
Serial Correlation (F- stat)								
R-Squared	0.2478		0.2478		0.2478		0.7338	
Adjused R-Squared	0.2278		0.2278		0.2278			

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.7551
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.

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1-R2	0.2662
N-1	154
N-p-1	150
	0.2733

Results of Panel Data Analysis - 3Factor + GlobalINVSENT
Euro Zone Crisis - Taiwan - Big Market Capitalisation

	Dependent Variables				Yes			
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects		OLS Firm Specific & Time	
Intercept	0.2480	***	0.2480	***	0.2480	***	0.1440	***
	(3.94)		(25.28)		(3.89)		(13.19)	
MRP	-3.5789	***	-3.5789	***	-3.5789	***	omitted	
	(-3.86)		(-25.11)		(-3.81)			
SMB	0.5123	**	0.5123	***	0.5123	**	omitted	
	(2.07)		(2.91)		(2.04)			
HML	-0.2192		-0.2192	***	-0.2192		omitted	
	(-1.15)		(-7.41)		(-1.14)			
GlobalINVSENT	0.2662		0.2662	***	0.2662		omitted	
	(1.56)		(9.74)		(1.54)			
Breusch-Pagan LM test								
Hausman test								
Observations	155		155		155		155	
Multicollinearity (vif)								
Heteroskedasticity (χ^2 - Stat)								
Serial Correlation (F- stat)								
R-Squared	0.1888		0.1888		0.1888		0.9738	
Adjused R-Squared	(0.1672)		(0.1672)		(0.1672)		0.9731	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.9994
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.0262
N-1	154
N-p-1	150
	0.0269

Results of Panel Data Analysis - 3Factor + GlobalINVSENT
Global Financial Crisis - China - World Model

	Dependent Variables				Yes		
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects	OLS Firm Specific & Time	
Intercept	-0.0541	***	-0.0541	***	-0.0541	-0.1233	***
	(-2.45)		(-11.77)		(-0.48)	(-19.26)	
WMRP	0.0200		0.0200		0.0200	omitted	
	(0.05)		(0.26)		(0.01)		
WSMB	0.0160	***	0.0160	***	0.0160	0.0129	
	(3.52)		(20.30)		(1.39)	(8.81)	
WHML	0.0222		0.0222	***	0.0222	-0.0666	
	(1.11)		(7.09)		(0.39)	(-5.53)	
WGlobalINVSENT	-0.1198		-0.1198	***	-0.1198	omitted	
	(-0.94)		(-7.03)		(-0.27)		
Breusch-Pagan LM test							
Hausman test							
Observations	900		900		900	900	
Multicollinearity (vif)							
Heteroskedasticity (χ^2 - Stat)							
Serial Correlation (F- stat)							
R-Squared	0.0178		0.0178		0.0178	0.9541	
Adjused R-Squared	0.0134		0.0134		0.0134	0.9539	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	1.0000
Test for the presence of time effect	0.0000
Time Dummies - F test (p-value)	

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.0459
N-1	899
N-p-1	895
	0.0461

Results of Panel Data Analysis - 3Factor + GlobalINVSENT
Global Financial Crisis - China - International Model Yes

	Dependent Variables							
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects		OLS Firm Specific & Time	
Intercept	-0.0144		-0.0144	***	-0.0144		-0.1237	***
	(-0.81)		(-3.04)		(-0.15)		(-18.96)	
DMRP	6.5927	***	6.5927	***	6.5927	*	omitted	
	(7.81)		(31.73)		(1.70)			
DSMB	-4.2164	***	-4.2164	***	-4.2164	**	omitted	
	(-11.36)		(-17.11)		(-2.00)			
DHML	-0.9094	***	-0.9094	***	-0.9094		omitted	
	(-3.41)		(-8.40)		(-0.64)			
DGlobalINVSENT	1.0369	***	1.0369	***	1.0369	*	omitted	
	(5.82)		(34.06)		(1.68)			
FMRP	-5.9849	***	-5.9849	***	-5.9849		omitted	
	(-8.27)		(-50.73)		(-1.55)			
FSMB	0.0014		0.0014		0.0014		0.0118	***
	(0.30)		(1.55)		(0.09)		(7.77)	
FHML	0.0677	***	0.0677	***	0.0677		-0.0683	***
	(3.50)		(28.11)		(0.77)		(-5.50)	
FGlobalINVSENT	-0.2447		-0.2447	***	-0.2447		omitted	
	(-1.43)		(-5.82)		(-0.32)			
Breusch-Pagan LM test								
Hausman test								
Observations	900		900		900		900	
Multicollinearity (vif)								
Heteroskedasticity (χ^2 - Stat)								
Serial Correlation (F- stat)								
R-Squared	0.2385		0.2385		0.2385		0.9541	
Adjused R-Squared	0.2316		0.2316		0.2316		0.9537	

Test for the presence of fixed firm effect
Fixed Effect Model - F test (p-value) 1.0000

Test for the presence of time effect
Time Dummies - F test (p-value) 0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.0459
N-1	899
N-p-1	891
	0.0463

Results of Panel Data Analysis - 3Factor + GlobalINVSENT
Global Financial Crisis - China - Domestics Model

	Dependent Variables				Yes			
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects		OLS Firm Specific & Time	
Intercept	-0.0718	***	-0.0718	***	-0.0718		-0.1220	***
	(-4.43)		(-18.46)		(-0.94)		(-19.32)	
DMRP	2.3223	***	2.3223	***	2.3223		omitted	
	(3.76)		(15.43)		(0.73)			
DSMB	-4.2689	***	-4.2689	***	-4.2689	*	omitted	
	(-11.67)		(-18.32)		(-1.84)			
DHML	-0.3265		-0.3265	***	-0.3265		omitted	
	(-1.29)		(-3.40)		(-0.24)			
DGlobalINVSENT	0.6804	***	0.6804	***	0.6804		omitted	
	(3.96)		(22.43)		(0.99)			
Breusch-Pagan LM test								
Hausman test								
Observations	900		900		900		900	
Multicollinearity (vif)								
Heteroskedasticity (χ^2 - Stat)								
Serial Correlation (F- stat)								
R-Squared	0.1603		0.1603		0.1603		0.9541	
Adjused R-Squared	0.1565		0.1565		0.1565		0.9539	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	1.0000
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.0459
N-1	899
N-p-1	895
	0.0461

Results of Panel Data Analysis - 3Factor + GlobalINVSENT
Global Financial Crisis - Hong Kong - World Model

	Dependent Variables						Yes	
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects		OLS Firm Specific & Time	
Intercept	0.1551	***	0.1551	***	0.1551		0.1824	***
	(5.96)		(6.82)		(1.30)		(13.98)	
WMRP	-2.8426	***	-2.8426	***	-2.8426		omitted	
	(-5.93)		(-8.89)		(-1.28)			
WSMB	0.0256	***	0.0256	***	0.0256	**	0.0117	***
	(4.79)		(8.03)		(2.47)		(3.04)	
WHML	0.0423	*	0.0423	**	0.0423		-0.2251	***
	(1.79)		(2.45)		(1.34)		(-9.42)	
WGlobalINVSENT	0.2614	*	0.2614	***	0.2614		omitted	
	(1.75)		(2.54)		(0.65)			
Breusch-Pagan LM test								
Hausman test								
Observations	900		900		900		900	
Multicollinearity (vif)								
Heteroskedasticity (χ^2 - Stat)								
Serial Correlation (F- stat)								
R-Squared	0.0779		0.0779		0.0779		0.05757	
Adjused R-Squared	0.0738		0.0738		0.0738		0.0534	
Test for the presence of fixed firm effect								
Fixed Effect Model - F test (p-value)	0.0063							
Test for the presence of time effect								
Time Dummies - F test (p-value)	0.0000							

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.94243
N-1	899
N-p-1	895
	0.9466

Results of Panel Data Analysis - 3Factor + GlobalINVSENT
Global Financial Crisis - Hong Kong - International Model

	Dependent Variables Pooled OLS		OLS Firm Specific Effects		OLS Time Effects		Yes OLS Firm Specific & Time	
Intercept	0.1739	***	0.1739	***	0.1739		-0.1821	***
	(6.77)		(8.41)		(1.51)		(-13.89)	
DMRP	-2.4392	**	-2.4392	***	-2.4392		omitted	
	(-2.07)		(-4.40)		(-0.60)			
DSMB	0.0311	***	0.0311	***	0.0311	**	0.0083	**
	(5.64)		(11.47)		(2.23)		(2.13)	
DHML	0.0598	**	0.0598	***	0.0598		-0.2279	****
	(2.34)		(4.82)		(1.11)		(-9.41)	
DGlobalINVSENT	0.8384	***	0.8384	***	0.8384		omitted	
	(3.65)		(5.08)		(1.22)			
FMRP	-3.0870	***	-3.0870	***	-3.0870		omitted	
	(-3.73)		(-4.65)		(-0.78)			
FSMB	-1.7890	***	-1.7890	***	-1.7890		omitted	
	(-4.41)		(-8.86)		(-1.08)			
FHML	-1.2576	***	-1.2576	***	-1.2576		omitted	
	(-3.89)		(-6.41)		(-1.00)			
FGlobalINVSENT	0.5208	***	0.5208	***	0.5208		omitted	
	(2.34)		(2.59)		(0.79)			
Breusch-Pagan LM test								
Hausman test								
Observations	900		900		900		900	
Multicollinearity (vif)								
Heteroskedasticity (χ^2 - Stat)								
Serial Correlation (F- stat)								
R-Squared	0.0979		0.0979		0.0979		0.5757	
Adjused R-Squared	0.0898		0.0898		0.0898		0.5719	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.0050
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.4243
N-1	899
N-p-1	891
	0.4281

Results of Panel Data Analysis - 3Factor + GlobalINVSENT
Global Financial Crisis - Hong Kong - Domestics Model

	Dependent Variables						Yes	
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects		OLS Firm Specific & Time	
Intercept	0.0961	***	0.0961	***	0.0961	***	-0.1821	***
	(4.54)		(6.49)		(6.49)		(-13.89)	
DMRP	-4.2450	***	-4.2450	***	-4.2450	***	omitted	
	(-4.47)		(-9.83)		(-9.83)			
DSMB	0.0248	***	0.0248	***	0.0248	***	0.0083	**
	(4.67)		(9.14)		(9.14)		(2.13)	
DHML	0.0240		0.0240		0.0240		-0.2279	***
	(0.99)		(1.52)		(1.52)		(-9.41)	
DGlobalINVSENT	0.6881	***	0.6881	***	0.6881	***	omitted	
	(3.01)		(4.01)		(4.01)			
Breusch-Pagan LM test								
Hausman test								
Observations	900		900		900		900	
Multicollinearity (vif)								
Heteroskedasticity (χ^2 - Stat)								
Serial Correlation (F- stat)								
R-Squared	0.0677		0.0677		0.0677		0.5757	
Adjused R-Squared	0.0635		0.0635		0.0635		0.5738	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.0072
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.4243
N-1	899
N-p-1	895
	0.4262

Lim, Chee Ming (2017) Noise-augmented asset pricing models:Evidence from the Greater China stock markets during two major financial crises. PhD thesis, University of Nottingham.

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http://eprints.nottingham.ac.uk/42468/47/Table%2036%20-%20Panel%20C.xls.pdf

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Results of Panel Data Analysis - 3Factor + GlobalINVSENT
Global Financial Crisis - Taiwan - World Model

	Dependent Variables				Yes			
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects		OLS Firm Specific & Time	
Intercept	0.1216	***	0.1216	***	0.1216		-0.1566	***
	(3.29)		(3.09)		(1.04)		(-17.03)	
WMRP	-2.1823	***	-2.1823	***	-2.1823		omitted	
	(-3.21)		(-2.35)		(-0.98)			
WSMB	0.0201	***	0.0201	***	0.0201	*	0.0172	***
	(2.65)		(6.32)		(1.69)		(4.98)	
WHML	-0.0125		-0.0125		-0.0125		-0.2903	***
	(-0.37)		(-1.01)		(-0.32)		(-22.17)	
WGlobalINVSENT	-0.0196		-0.0196		-0.0196		omitted	
	(-0.09)		(-0.12)		(-0.04)			
Breusch-Pagan LM test								
Hausman test								
Observations	900		900		900		900	
Multicollinearity (vif)								
Heteroskedasticity (χ^2 - Stat)								
Serial Correlation (F- stat)								
R-Squared	0.0203		0.0203		0.0203		0.2803	
Adjused R-Squared	0.0159		0.0159		0.0159		0.2771	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.3953
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.7197
N-1	899
N-p-1	895
	0.7229

Results of Panel Data Analysis - 3Factor + GlobalINVSENT
Global Financial Crisis - Taiwan - International Model

	Dependent Variables				Yes			
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects		OLS Firm Specific & Time	
Intercept	0.1511	***	0.1511	***	0.1511		-0.1566	***
	(4.42)		(13.90)		(1.46)		(-17.03)	
DMRP	omitted		omitted		omitted		omitted	
DSMB	-4.2089	**	-4.2089	***	-4.2089		omitted	
	(-2.26)		(-3.99)		(-0.97)			
DHML	-6.9898	***	-6.9898	***	-6.9898	**	omitted	
	(-5.33)		(-2.86)		(-2.30)			
DGlobalINVSENT	-0.9208		-0.9208		-0.9208		omitted	
	(-0.56)		(-1.39)		(-0.22)			
FMRP	-3.5828	***	-3.5828	***	-3.5828	*	omitted	
	(-4.86)		(-18.78)		(-1.67)			
FSMB	0.0218	***	0.0218	***	0.0218		0.0172	***
	(2.88)		(11.57)		(1.62)		(4.98)	
FHML	0.0228		0.0228	**	0.0228		-0.2905	***
	(0.68)		(2.07)		(0.47)		(-22.22)	
FGlobalINVSENT	-0.3636		-0.3636	***	-0.3636		omitted	
	(-1.55)		(-4.24)		(-0.61)			
Breusch-Pagan LM test								
Hausman test								
Observations	900		900		900		900	
Multicollinearity (vif)								
Heteroskedasticity (χ^2 - Stat)								
Serial Correlation (F- stat)								
R-Squared	0.0756		0.0756		0.0756		0.2803	
Adjused R-Squared	0.0684		0.0684		0.0684		0.2738	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.3218
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.7197
N-1	899
N-p-1	891
	0.7262

Results of Panel Data Analysis - 3Factor + GlobalINVSENT
Global Financial Crisis - Taiwan - Domestics Model

Yes

	Dependent Variables							
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects		OLS Firm Specific & Time	
Intercept	0.0049		0.0049		0.0049		-0.1528	***
	(0.63)		(1.49)		(0.24)		(-16.73)	
DMRP	omitted		omitted		omitted		omitted	
DSMB	-3.9761	**	-3.9761	***	-3.9761		omitted	
	(-2.18)		(-3.62)		(-0.86)			
DHML	-5.5242	***	-5.5242	***	-5.5242	*	omitted	
	(-4.41)		(-2.35)		(-1.85)			
DGlobalINVSENT	-2.0248		-2.0248	***	-2.0248		omitted	
	(-1.28)		(-3.26)		(-0.47)			
Breusch-Pagan LM test								
Hausman test								
Observations	900		900		900		900	
Multicollinearity (vif)								
Heteroskedasticity (χ^2 - Stat)								
Serial Correlation (F- stat)								
R-Squared	0.0380		0.0380		0.0380		0.2803	
Adjused R-Squared	0.0348		0.0348		0.0348		0.2771	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.3689
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.7197
N-1	899
N-p-1	895
	0.7229

Results of Panel Data Analysis - 3 Factor + GlobalINVSENT
Euro Zone Crisis - China - World Model

	Dependent Variables				Yes			
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects		OLS Firm Specific & Time	
Intercept	-5.3079	***	-5.3079	***	-5.3079	***	-4.1424	***
	(-73.76)		(-102.24)		(-22.00)		(166.95)	
WMRP	24.7155	***	24.7155	***	24.7155	***	omitted	
	(21.74)		(27.42)		(7.14)			
WSMB	0.3497		0.3497		0.3497		omitted	
	(0.76)		(0.76)		(0.26)			
WHML	0.8271	*	0.8271	***	0.8271		omitted	
	(1.66)		(3.64)		(0.41)			
WGlobalINVSENT	1.4219	***	1.4219	***	1.4219		omitted	
	(3.47)		(10.58)		(0.95)			
Breusch-Pagan LM test								
Hausman test								
Observations	775		775		775		775	
Multicollinearity (vif)								
Heteroskedasticity (χ^2 - Stat)								
Serial Correlation (F- stat)								
R-Squared	0.4041		0.4041		0.4041		0.8704	
Adjused R-Squared	0.4010		0.4010		0.4010		0.8697	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	1.0000
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{\text{adjusted}} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.1296
N-1	774
N-p-1	770
	0.1303

Results of Panel Data Analysis - 3Factor + GlobalINVSENT
Euro Zone Crisis - China - International Model

	Dependent Variables				Yes			
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects		OLS Firm Specific & Time	
Intercept	-5.2634	***	-5.2634	***	-5.2634	***	-4.1424	***
	(-62.70)		(-93.89)		(-17.53)		(-166.95)	
DMRP	10.6046	***	10.6046	***	10.6046		omitted	
	(3.81)		(14.54)		(0.87)			
DSMB	-1.2981	*	-1.2981	**	-1.2981		omitted	
	(-1.87)		(-2.25)		(-0.65)			
DHML	0.6383		0.6383		0.6383		omitted	
	(0.68)		(1.18)		(1.18)			
DGlobalINVSENT	3.6186	***	3.6186	***	3.6186		omitted	
	(3.99)		(21.25)		(1.01)			
FMRP	40.2739	***	40.2739	***	40.2739	**	omitted	
	(11.16)		(21.90)		(2.18)			
FSMB	0.3986		0.3986		0.3986		omitted	
	(0.50)		(0.84)		(0.18)			
FHML	3.0597	***	3.0597	***	3.0597		omitted	
	(3.28)		(14.74)		(0.93)			
FGlobalINVSENT	2.8365	***	2.8365	***	2.8365	*	omitted	
	(5.63)		(18.85)		(1.76)			
Breusch-Pagan LM test								
Hausman test								
Observations	775		775		775		775	
Multicollinearity (vif)								
Heteroskedasticity (χ^2 - Stat)								
Serial Correlation (F- stat)								
R-Squared	0.3452		0.3452		0.3452		0.8704	
Adjused R-Squared	0.3384		0.3384		0.3384		0.8689	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	1.0000

Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.1296
N-1	774
N-p-1	765
	0.1311

Results of Panel Data Analysis - 3Factor + GlobalINVSENT
Euro Zone Crisis - China - Domestics Model

Yes

	Dependent Variables							
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects		OLS Firm Specific & Time	
Intercept	-4.7307	***	-4.7307	***	-4.7307	***	-4.1424	***
	(-62.71)		(-133.73)		(-16.44)		(-166.95)	
DMRP	29.4737	***	29.4737	***	29.4737	***	omitted	
	(12.75)		(22.51)		(3.48)			
DSMB	1.2045	**	1.2045	***	1.2045		omitted	
	(2.28)		(3.10)		(0.84)			
DHML	1.0639		1.0639	**	1.0639		omitted	
	(1.11)		(1.91)		(0.23)			
DGlobalINVSENT	3.3521	***	3.3521	***	3.3521		omitted	
	(3.52)		(18.53)		(0.87)			
Breusch-Pagan LM test								
Hausman test								
Observations	775		775		775		775	
Multicollinearity (vif)								
Heteroskedasticity (χ^2 - Stat)								
Serial Correlation (F- stat)								
R-Squared	0.2110		0.2110		0.2110		0.8704	
Adjused R-Squared	0.2069		0.2069		0.2069			

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	1.0000
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where

R^2 = sample R-square

p = Number of predictors

N = Total sample size.

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1-R2	0.1296
N-1	774
N-p-1	770

Results of Panel Data Analysis - 3Factor + GlobalINVSENT

Euro Zone Crisis - Hong Kong - World Model

					Yes			
	Dependent Variables							
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects		OLS Firm Specific & Time	
Intercept	0.0651	***	0.0651	***	0.0651		0.0456	**
	(2.82)		(2.68)		(1.12)		(2.09)	
WMRP	-1.0189	***	-1.0189	***	-1.0189		omitted	
	(-2.80)		(-2.93)		(-1.05)			
WSMB	-0.5966	***	-0.5966	***	-0.5966		omitted	
	(-4.02)		(-3.31)		(-1.59)			
WHML	0.4643	***	0.4643	**	0.4643		omitted	
	(2.90)		(2.19)		(1.28)			
WGlobalINVSENT	0.9249	***	0.9249	***	0.9249	***	omitted	
	(7.05)		(3.64)		(2.63)			
Breusch-Pagan LM test								
Hausman test								
Observations	775		775		775		775	
Multicollinearity (vif)								
Heteroskedasticity (χ^2 - Stat)								
Serial Correlation (F- stat)								
R-Squared	0.0748		0.0748		0.0748		0.2979	
Adjused R-Squared	0.0700		0.0700		0.0700		0.2943	
Test for the presence of fixed firm effect								
Fixed Effect Model - F test (p-value)	0.1444							
Test for the presence of time effect								
Time Dummies - F test (p-value)	0.0000							

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where

R^2 = sample R-square

p = Number of predictors

N = Total sample size.

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1-R2	0.7021
N-1	774
N-p-1	770
	0.7057

Results of Panel Data Analysis - 3Factor + GlobalINVSENT
Euro Zone Crisis - Hong Kong - International Model

	Dependent Variables				Yes			
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects		OLS Firm Specific & Time	
Intercept	0.0787	***	0.0787	***	0.0787	*	0.0456	**
	(3.85)		(3.59)		(1.76)		(2.09)	
DMRP	2.8372	**	2.8372	***	2.8372		omitted	
	(2.09)		(3.21)		(1.08)			
DSMB	0.1511		0.1511		0.1511		omitted	
	(0.63)		(0.62)		(0.24)			
DHML	-0.2090		-0.2090		-0.2090		omitted	
	(-0.80)		(-0.61)		(-0.36)			
DGlobalINVSENT	1.1157	***	1.1157	***	1.1157	***	omitted	
	(7.27)		(3.03)		(3.56)			
FMRP	-3.5857	***	-3.5857	***	-3.5857	***	omitted	
	(-4.50)		(-5.15)		(-2.60)			
FSMB	-0.7327	***	-0.7327	***	-0.7327		omitted	
	(-3.66)		(-4.75)		(-1.34)			
FHML	1.0668	***	1.0668	***	1.0668	**	omitted	
	(3.74)		(3.86)		(2.11)			
FGlobalINVSENT	0.3489		0.3489	*	0.3489		omitted	
	(1.28)		(1.92)		(0.55)			
Breusch-Pagan LM test								
Hausman test								
Observations	775		775		775		775	
Multicollinearity (vif)								
Heteroskedasticity (χ^2 - Stat)								
Serial Correlation (F- stat)								
R-Squared	0.1277		0.1277		0.1277		0.2979	
Adjused R-Squared	0.1186		0.1186		0.1186		0.2943	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.1020
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.7021
N-1	774
N-p-1	770
	0.7057

Results of Panel Data Analysis - 3Factor + GlobalINVSENT
Euro Zone Crisis - Hong Kong - Domestics Model

	Dependent Variables							
					Yes			
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects		OLS Firm Specific & Time	
Intercept	0.0079		0.0079		0.0079		0.0456	**
	(0.42)		(0.46)		(0.17)		(2.09)	
DMRP	-0.4429		-0.4429		-0.4429		omitted	
	(-0.54)		(-0.72)		(-0.21)			
DSMB	0.5491	***	0.5491	***	0.5491		omitted	
	(2.75)		(2.83)		(0.86)			
DHML	-0.3985	*	-0.3985		-0.3985		omitted	
	(-1.66)		(-1.17)		(-0.58)			
DGlobalINVSENT	0.8098	***	0.8098	**	0.8098	***	omitted	
	(5.61)		(2.26)		(2.68)			
Breusch-Pagan LM test								
Hausman test								
Observations	775		775		775		775	
Multicollinearity (vif)								
Heteroskedasticity (χ^2 - Stat)								
Serial Correlation (F- stat)								
R-Squared	0.0530		0.0530		0.0530		0.2979	
Adjused R-Squared	(0.0480)		(0.0480)		(0.0480)		0.2943	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.1658
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.7021
N-1	774
N-p-1	770
	0.705747

Results of Panel Data Analysis - 3Factor + GlobalINVSENT

Euro Zone Crisis - Taiwan - World Model

	Dependent Variables				Yes			
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects		OLS Firm Specific & Time	
Intercept	0.0540	***	0.0540	***	0.0540		0.1540	***
	(4.09)		(13.43)		(0.85)		(18.27)	
WMRP	-0.9954	***	-0.9954	***	-0.9954		omitted	
	(-4.77)		(-18.02)		(-0.93)			
WSMB	-0.5847	***	-0.5847	***	-0.5847		omitted	
	(-6.88)		(-19.62)		(-1.41)			
WHML	0.8695	***	0.8695	***	0.8695	**	omitted	
	(9.48)		(28.53)		(2.22)			
WGlobalINVSENT	0.6810	***	0.6810	***	0.6810	*	omitted	
	(9.07)		(29.75)		(1.88)			
Breusch-Pagan LM test								
Hausman test								
Observations	775		775		775		775	
Multicollinearity (vif)								
Heteroskedasticity (χ^2 - Stat)								
Serial Correlation (F- stat)								
R-Squared	0.1921		0.1921		0.1921		0.8677	
Adjused R-Squared	0.1879		0.1879		0.1879		0.8670	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	1.0000
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where

R^2 = sample R-square

p = Number of predictors

N = Total sample size.

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1-R2	0.1323
N-1	774
N-p-1	770
	0.1330

Results of Panel Data Analysis - 3Factor + GlobalINVSENT
Euro Zone Crisis - Taiwan - International Model

	Dependent Variables				Yes		
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects		OLS Firm Specific & Time
Intercept	-0.0985	***	-0.0985	***	-0.0985		0.1540
	(-5.67)		(-9.73)		(-1.58)		(18.63)
DMRP	13.8692	***	13.8692	***	13.8692	**	omitted
	(8.04)		(15.40)		(2.52)		
DSMB	6.6280	***	6.6280	***	6.6280	*	omitted
	(6.15)		(17.22)		(1.98)		
DHML	-6.5602	***	-6.5602	***	-6.5602	**	omitted
	(-7.75)		(-6.77)		(-2.08)		
DGlobalINVSENT	-5.4998	***	-5.4998	***	-5.4998		omitted
	(-7.15)		(-20.01)		(-1.34)		
FMRP	-0.9015	***	-0.9015	***	-0.9015		omitted
	(-4.82)		(-17.26)		(-1.11)		
FSMB	-0.3059	***	-0.3059	***	-0.3059		omitted
	(-3.58)		(-11.52)		(-0.79)		
FHML	0.9391	***	0.9391	***	0.9391	**	omitted
	(9.39)		(30.63)		(2.35)		
FGlobalINVSENT	1.0209	***	1.0209	***	1.0209	***	omitted
	(13.13)		(39.63)		(3.23)		
Breusch-Pagan LM test							
Hausman test							
Observations	775		775		775		775
Multicollinearity (vif)							
Heteroskedasticity (χ^2 - Stat)							
Serial Correlation (F- stat)							
R-Squared	0.3697		0.3697		0.3697		0.8677
Adjused R-Squared	0.3631		0.3631		0.3631		0.8670

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.9997
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.1323
N-1	774
N-p-1	770
	0.132987

Results of Panel Data Analysis - 3Factor + GlobalINVSENT
Euro Zone Crisis - Taiwan - Domestics Model

Yes

	Dependent Variables Pooled OLS	OLS Firm Specific Effects	OLS Time Effects	OLS Firm Specific & Time
Intercept	-0.0672 ***	-0.0672 ***	-0.0672	0.1540 ***
	(-4.11)	(-7.90)	(-1.60)	(18.27)
DMRP	5.8058 ***	5.8058 ***	5.8058	omitted
	(3.48)	(6.88)	(1.24)	
DSMB	10.7952 ***	10.7952 ***	10.7952 ***	omitted
	(9.89)	(26.08)	(6.41)	
DHML	-4.2550 ***	-4.2550 ***	-4.2550 ***	omitted
	(-4.92)	(-4.83)	(-3.73)	
DGlobalINVSENT	-0.3210	-0.3210	-0.3210	omitted
	(-0.48)	(-1.45)	(-1.60)	
Breusch-Pagan LM test				
Hausman test				
Observations	775	775	775	775
Multicollinearity (vif)				
Heteroskedasticity (χ^2 - Stat)				
Serial Correlation (F- stat)				
R-Squared	0.1550	0.1550	0.1550	0.8677
Adjused R-Squared	0.1506	0.1506	0.1506	0.8670

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	1.0000
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.

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1-R2	0.1323
N-1	774
N-p-1	770
	0.1330

Results of Panel Data Analysis - 5 Factor + GlobalINVSENT

Global Financial Crisis - China

	Dependent Variables					Yes	
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects		OLS Firm Specific & Time
Intercept	0.0409	***	0.0409	***	0.0409		-0.1220
	(2.60)		(10.07)		(0.62)		(-19.70)
MRP	-1.0213	***	-1.0213	***	-1.0213		omitted
	(-3.33)		(-14.83)		(-0.69)		
SMB	-2.3562	***	-2.3562	***	-2.3562	**	omitted
	(-12.67)		(-21.34)		(-2.07)		
HML	-0.1772		-0.1772	***	-0.1772		omitted
	(-1.26)		(-3.34)		(-0.20)		
Investment	-1.0194	***	-1.0194	***	-1.0194		omitted
	(-3.18)		(-12.80)		(-0.65)		
Profitability	0.6643	**	0.6643	***	0.6643		omitted
	(2.17)		(7.66)		(0.50)		
GlobalINVSENT	0.2446	***	0.2446	***	0.2446		omitted
	(2.49)		(11.90)		(0.55)		
Breusch-Pagan LM test							
Hausman test							
Observations	900		900		900		900
Multicollinearity (vif)							
Heteroskedasticity (χ^2 - Stat)							
Serial Correlation (F- stat)							
R-Squared	0.1651		0.1651		0.1651		0.9541
Adjused R-Squared	0.1595		0.1595		0.1595		0.9538

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	1.0000
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where

R^2 = sample R-square

p = Number of predictors

N = Total sample size.

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1-R2	0.0459
N-1	899
N-p-1	893
	0.0462

Results of Panel Data Analysis - 5 Factor + GlobalINVSENT
Global Financial Crisis - Hong Kong

	Dependent Variables						Yes	
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects		OLS Firm Specific & Time	
Intercept	0.0637	***	0.0637	***	0.0637	**	-0.1832	***
	(3.90)		(5.23)		(2.19)		(13.91)	
MRP	-0.8567	***	-0.8567	***	-0.8567	*	omitted	
	(-3.20)		(-5.38)		(-1.81)		(collinearity)	
SMB	0.0023		0.0023	*	0.0023		0.0028	*
	(1.44)		(2.18)		(0.73)		(1.97)	
HML	0.0305	***	0.0305	***	0.0305		-0.0829	***
	(4.30)		(5.59)		(1.57)		(-9.39)	
Investment	-0.6168	***	-0.6168	***	-0.6168	***	omitted	
	(-15.29)		(-10.11)		(-5.59)		(collinearity)	
Profitability	-0.1499		-0.1499		-0.1499		omitted	
	(-1.58)		(-0.97)		(-0.85)		(collinearity)	
GlobalINVSENT	0.1855	***	0.1855	***	0.1855		omitted	
	(3.01)		(3.17)		(1.25)		(collinearity)	
Breusch-Pagan LM test								
Hausman test								
Observations	900		900		900		900	
Multicollinearity (vif)								
Heteroskedasticity (χ^2 - Stat)								
Serial Correlation (F- stat)								
R-Squared	0.4419		0.4419		0.4419		0.5757	
Adjused R-Squared	0.4382		0.4382		0.4382		0.5728	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.0000
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.4243
N-1	899
N-p-1	893
	0.4272

Results of Panel Data Analysis - 5 Factor + GlobalINVSENT
Global Financial Crisis - Taiwan

			Yes	
	Dependent Variables			
	Pooled OLS	OLS Firm Specific Effects	OLS Time Effects	OLS Firm Specific & Time
Intercept	0.2878 ***	0.2878 ***	0.2878 ***	0.1528 ***
	(5.55)	(26.72)	(2.68)	(-16.73)
MRP	-4.0858 ***	-4.0858 ***	-4.0858 ***	omitted
	(-5.01)	(-24.52)	(-2.57)	
SMB	-0.8851 ***	-0.8851 ***	-0.8851	omitted
	(-4.17)	(-6.43)	(-1.60)	
HML	-0.7221 ***	-0.7221 ***	-0.7221 *	omitted
	(-3.54)	(-6.82)	(-1.74)	
Investment	-0.1178	-0.1178	-0.1178	omitted
	(-0.56)	(-0.51)	(-0.28)	
Profitability	-1.1338 ***	-1.1338 ***	-1.1338	omitted
	(-4.39)	(-8.67)	(-1.64)	
GlobalINVSENT	-0.2407	-0.2407 ***	-0.2407	omitted
	(-1.62)	(-8.05)	(-0.65)	
Breusch-Pagan LM test				
Hausman test				
Observations	900	900	900	900
Multicollinearity (vif)				
Heteroskedasticity (χ^2 - Stat)				
Serial Correlation (F- stat)				
R-Squared	0.1147	0.1147	0.1147	0.2803
Adjused R-Squared	0.1088	0.1088	0.1088	0.2755

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.2660
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.

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1-R2	0.7197
N-1	899
N-p-1	893
	0.724536

Results of Panel Data Analysis - 5 Factor + GlobalINVSENT
Euro Zone Crisis - China

	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects		OLS Firm Specific & Time	
	Dependent Variables				Yes			
Intercept	-4.9917	***	-4.9917	***	-4.9917	***	-4.1424	***
	(-82.31)		(-202.85)		(-21.31)		(-166.95)	
MRP	19.2552	***	19.2552	***	19.2552	***	omitted	
	(19.75)		(36.77)		(5.26)			
SMB	0.7954	***	0.7954	***	0.7954		omitted	
	(2.53)		(3.44)		(0.71)			
HML	-0.5240		-0.5240	**	-0.5240		omitted	
	(-0.88)		(-2.10)		(-0.16)			
Investment	1.8377	*	1.8377	***	1.8377		omitted	
	(1.76)		(6.36)		(0.38)			
Profitability	-0.7092	***	-0.7092	***	-0.7092		omitted	
	(-3.18)		(-9.00)		(-0.55)			
GlobalINVSENT	1.4125	***	1.4125	***	1.4125		omitted	
	(3.08)		(20.33)		(0.87)			
Breusch-Pagan LM test								
Hausman test								
Observations	775		775		775		775	
Multicollinearity (vif)								
Heteroskedasticity (χ^2 - Stat)								
Serial Correlation (F- stat)								
R-Squared	0.3729		0.3729		0.3729		0.8704	
Adjused R-Squared	0.3680		0.3680		0.3680		0.8694	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	1.0000
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.1296
N-1	774
N-p-1	768

0.130613

Results of Panel Data Analysis - 5 Factor + GlobalINVSENT
Euro Zone Crisis - Hong Kong

	Dependent Variables				Yes		
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects		OLS Firm Specific & Time
Intercept	0.0401	*	0.0401	***	0.0401		0.0456
	(1.67)		(2.28)		(0.70)		(2.09)
MRP	-0.7099	*	-0.7099	***	-0.7099		omitted
	(-1.83)		(-3.13)		(-0.73)		
SMB	0.0277		0.0277		0.0277		omitted
	(0.38)		(0.38)		(0.10)		
HML	-0.1340		-0.1340		-0.1340		omitted
	(-1.52)		(-1.25)		(-0.56)		
Investment	-0.0888		-0.0888		-0.0888		omitted
	(-1.13)		(-0.91)		(-0.54)		
Profitability	-0.3199	***	-0.3199	***	-0.3199		omitted
	(-2.71)		(-3.89)		(-0.95)		
GlobalINVSENT	0.1982		0.1982	*	0.1982	*	omitted
	(3.27)		(1.84)		(1.84)		
Breusch-Pagan LM test							
Hausman test							
Observations	775		775		775		775
Multicollinearity (vif)							
Heteroskedasticity (χ^2 - Stat)							
Serial Correlation (F- stat)							
R-Squared	0.0735		0.0735		0.0735		0.2979
Adjused R-Squared	0.0663		0.0663		0.0663		0.2924

Test for the presence of fixed firm effect
Fixed Effect Model - F test (p-value) 0.1479

Test for the presence of time effect
Time Dummies - F test (p-value) 0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.

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1-R2	0.7021
N-1	774
N-p-1	768
	0.707585

Results of Panel Data Analysis - 5 Factor + GlobalINVSENT
Euro Zone Crisis - Taiwan

	Dependent Variables		Yes	
	Pooled OLS	OLS Firm Specific Effects	OLS Time Effects	OLS Firm Specific & Time
Intercept	0.3500	0.3500	0.3500 **	0.0154 ***
	(11.19)	(28.45)	(2.26)	(18.27)
MRP	-4.8645	-4.8645	-4.8645 **	omitted
	(-10.91)	(-30.87)	(-2.22)	
SMB	-0.9659	-0.9659	-0.9659	omitted
	(-8.37)	(-18.66)	(-1.47)	
HML	0.2433	0.2433	0.2433	omitted
	(2.44)	(2.34)	(0.47)	
Investment	-0.5177	-0.5177	-0.5177	omitted
	(-2.23)	(-5.53)	(-0.43)	
Profitability	-0.3636	-0.3636	-0.3636	omitted
	(-1.93)	(-4.84)	(-0.38)	
GlobalINVSENT	0.6619	0.6619	0.6619 *	omitted
	(7.35)	(21.79)	(1.80)	
Breusch-Pagan LM test				
Hausman test				
Observations	775	775	775	775
Multicollinearity (vif)				
Heteroskedasticity (χ^2 - Stat)				
Serial Correlation (F- stat)				
R-Squared	0.2505	0.2505	0.2505	0.8677
Adjused R-Squared	0.2446	0.2446	0.2446	0.8667

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.9999
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.1323
N-1	774
N-p-1	768
	0.1333

Results of Panel Data Analysis - 5 Factor + GlobalINVSENT
Global Financial Crisis - China - Small Market Capitalisation

	Dependent Variables				Yes			
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects		OLS Firm Specific & Time	
Intercept	0.0609	**	0.0609	***	0.0609		-0.0520	***
	(2.02)		(6.45)		(0.84)		(-5.36)	
MRP	-0.6605		-0.6605	***	-0.6605		omitted	
	(-1.08)		(-4.14)		(-0.42)			
SMB	-0.9433	***	-0.9433	***	-0.9433	***	omitted	
	(-4.69)		(-4.43)		(-2.17)			
HML	-0.2469		-0.2469	***	-0.2469		omitted	
	(-1.05)		(-2.89)		(-0.53)			
Investment	0.0705		0.0705	***	0.0705		omitted	
	(0.27)		(2.52)		(0.13)			
Profitability	0.5130	**	0.5130	***	0.5130		omitted	
	(2.19)		(6.78)		(1.39)			
GlobalINVSENT	0.2532		0.2532	***	0.2532		omitted	
	(1.51)		(9.71)		(0.95)			
Breusch-Pagan LM test								
Hausman test								
Observations	180		180		180		180	
Multicollinearity (vif)								
Heteroskedasticity (χ^2 - Stat)								
Serial Correlation (F- stat)								
R-Squared	0.2438		0.2438		0.2438		0.8988	
Adjused R-Squared	(0.2176)		(0.2176)		(0.2176)		0.8953	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.9515
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.

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1-R2	0.1012
N-1	179
N-p-1	173
	0.10471

Results of Panel Data Analysis - 5 Factor + GlobalINVSENT
Global Financial Crisis - Hong Kong - Small Market Capitalisation

Yes

	Dependent Variables Pooled OLS		OLS Firm Specific Effects		OLS Time Effects		OLS Firm Specific & Time
Intercept	0.1170	***	0.1170	***	0.1170	**	-0.1100
	(3.51)		(6.80)		(2.35)		(-0.0206)
MRP	-1.5900	***	-1.5900	***	-1.5900	*	omitted
	(-2.95)		(-6.35)		(-1.73)		
SMB	0.0534		0.0534		0.0534		omitted
	(0.46)		(0.30)		(0.19)		
HML	0.0477		0.0477		0.0477		omitted
	(0.40)		(1.07)		(0.20)		
Investment	0.1830	*	0.1830	***	0.1830		omitted
	(1.77)		(3.28)		(0.83)		
Profitability	-0.7809	***	-0.7809	***	-0.7809	**	omitted
	(-6.46)		(-20.91)		(-2.16)		
GlobalINVSENT	0.5189	***	0.5189	***	0.5189		omitted
	(3.61)		(4.22)		(1.36)		
Breusch-Pagan LM test							
Hausman test							
Observations	180		180		180		180
Multicollinearity (vif)							
Heteroskedasticity (χ^2 - Stat)							
Serial Correlation (F- stat)							
R-Squared	0.2966		0.2966		0.2966		0.7885
Adjused R-Squared	0.2722		0.2722		0.2722		0.7812

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.0784
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.2115
N-1	179
N-p-1	173
	0.2188

Results of Panel Data Analysis - 5 Factor + GlobalINVSENT
Global Financial Crisis - Taiwan - Small Market Capitalisation

	Dependent Variables			Yes
	Pooled OLS	OLS Firm Specific Effects	OLS Time Effects	OLS Firm Specific & Time
Intercept	0.0303	0.0303	0.0303	-0.1662 ***
	(0.95)	(0.98)	(1.34)	(-6.53)
MRP	-0.0302	-0.0302	-0.0302	0.4695
	(-0.06)	(-0.05)	(-0.08)	(1.31)
SMB	-0.6242 ***	-0.6242 ***	-0.6242 ***	0.2724
	(-3.62)	(-3.41)	(-2.90)	(1.20)
HML	-0.8143 ***	-0.8143 ***	-0.8143 ***	omitted
	(-4.67)	(-10.11)	(-3.83)	
Investment	-0.0391	-0.0391	-0.0391	omitted
	(-0.10)	(-0.78)	(-0.11)	
Profitability	-0.2802	-0.2802 ***	-0.2802	omitted
	(-0.78)	(-5.33)	(-0.80)	
GlobalINVSENT	-0.2537	-0.2537 ***	-0.2537	omitted
	(-0.88)	(-6.48)	(-0.82)	
Breusch-Pagan LM test				
Hausman test				
Observations	180	180	180	180
Multicollinearity (vif)				
Heteroskedasticity (χ^2 - Stat)				
Serial Correlation (F- stat)				
R-Squared	0.2031	0.2031	0.2031	0.4221
Adjused R-Squared	0.1754	0.1754	0.1754	0.4021

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.0117
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.

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1-R2	0.5779
N-1	179
N-p-1	173
	0.5979

Results of Panel Data Analysis - 5 Factor + GlobalINVSENT
Global Financial Crisis - China - Big Market Capitalisation

	Dependent Variables		Yes	
	Pooled OLS	OLS Firm Specific Effects	OLS Time Effects	OLS Firm Specific & Time
Intercept	0.0200	0.0200 ***	0.0200	-0.0580 ***
	(0.59)	(9.55)	(0.26)	(-3.94)
MRP	-0.5337	-0.5337 ***	-0.5337	omitted
	(-0.80)	(-12.62)	(-0.33)	
SMB	0.6623	0.6623 ***	0.6623	omitted
	(2.09)	(4.04)	(0.98)	
HML	-0.0512	-0.0512 ***	-0.0512	omitted
	(-0.18)	(-2.22)	-(-0.08)	
Investment	0.0646	0.0646 ***	0.0646	omitted
	(0.38)	(9.79)	(0.37)	
Profitability	0.5756	0.5756 ***	0.5756 *	omitted
	(2.70)	(28.67)	(1.69)	
GlobalINVSENT	-0.1951	-0.1951 ***	-0.1951	omitted
	(-0.95)	(-12.18)	(-0.75)	
Breusch-Pagan LM test				
Hausman test				
Observations	180	180	180	180
Multicollinearity (vif)				
Heteroskedasticity (χ^2 - Stat)				
Serial Correlation (F- stat)				
R-Squared	0.0646	0.0646	0.0646	0.9755
Adjused R-Squared	0.0322	0.0322	0.0322	0.9747

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.9853
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.0245
N-1	179
N-p-1	173
	0.02535

Results of Panel Data Analysis - 5 Factor + GlobalINVSENT
Global Financial Crisis - Hong Kong - Big Market Capitalisation

	Dependent Variables				Yes			
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects		OLS Firm Specific & Time	
Intercept	0.1521	***	0.1521	***	0.1521	***	-0.0196	***
	(4.87)		(18.60)		(3.08)		(-25.92)	
MRP	-2.0869	***	-2.0869	***	-2.0869	**	omitted	
	(-4.12)		(-18.91)		(-2.56)			
SMB	-0.2767	*	-0.2767		-0.2767		omitted	
	(-1.80)		(-1.48)		(-0.90)			
HML	0.0543		0.0543		0.0543		omitted	
	(0.42)		(0.49)		(0.24)			
Investment	-0.0054		-0.0054		-0.0054		omitted	
	(-0.04)		(-0.20)		(-0.02)			
Profitability	-1.4372	***	-1.4372	***	-1.4372	***	omitted	
	(-11.59)		(-19.10)		(-5.83)			
GlobalINVSENT	0.2979	***	0.2979	***	0.2979		omitted	
	(2.30)		(5.48)		(1.63)			
Breusch-Pagan LM test								
Hausman test								
Observations	180		180		180		180	
Multicollinearity (vif)								
Heteroskedasticity (χ^2 - Stat)								
Serial Correlation (F- stat)								
R-Squared	0.4797		0.4797		0.4797		0.8376	
Adjused R-Squared	0.4616		0.4616		0.4616		0.8320	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.9614
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.1624
N-1	179
N-p-1	173
	0.1680

Results of Panel Data Analysis - 5 Factor + GlobalINVSENT
Global Financial Crisis - Taiwan - Big Market Capitalisation

					Yes		
	Dependent Variables						
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects		OLS Firm Specific & Time
Intercept	0.0019		0.0019		0.0019		-0.1399
	(0.13)		(0.20)		(0.91)		(-8.50)
MRP	-0.1397		-0.1397		-0.1397		-0.0031
	(-0.59)		(-1.02)		(-0.98)		(-0.17)
SMB	0.8306	***	0.8306	***	0.8306		omitted
	(4.01)		(5.00)		(1.09)		
HML	-0.2937	*	-0.2937	***	-0.2937		omitted
	(-1.65)		(-16.98)		(-0.61)		
Investment	2.1580	***	2.1580	***	2.1580	***	omitted
	(8.59)		(22.74)		(6.15)		
Profitability	-2.1870	***	-2.1870	***	-2.1870	***	omitted
	(-9.25)		(-23.99)		(-4.23)		
GlobalINVSENT	-0.1455		-0.1455	***	-0.1455		omitted
	(-1.08)		(-3.87)		(-0.49)		
Breusch-Pagan LM test							
Hausman test							
Observations	180		180		180		180
Multicollinearity (vif)							
Heteroskedasticity (χ^2 - Stat)							
Serial Correlation (F- stat)							
R-Squared	0.5191		0.5191		0.5191		0.9677
Adjused R-Squared	0.5024		0.5024		0.5024		

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.3925
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.0323
N-1	179
N-p-1	173
	0.0334
	0.0334

Results of Panel Data Analysis - 5 Factor + GlobalINVSENT
Euro Zone Crisis - China - Small Market Capitalisation

	Dependent Variables				Yes			
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects		OLS Firm Specific & Time	
Intercept	0.0216		0.0216	***	0.0216		0.0420	***
	(1.35)		(22.24)		(0.71)		(11.22)	
MRP	0.1336		0.1336	***	0.1336		omitted	
	(0.50)		(6.36)		(0.25)			
SMB	-1.4909	***	-1.4909	***	-1.4909	***	omitted	
	(-9.39)		(-8.30)		(-4.65)			
HML	-0.4726	***	-0.4726	***	-0.4726	*	omitted	
	(-3.90)		(-15.76)		(-1.85)			
Investment	0.5839	***	0.5839	***	0.5839	*	omitted	
	(3.44)		(13.76)		(1.65)			
Profitability	-1.0526	***	-1.0526	***	-1.0526	***	omitted	
	(-7.87)		(-44.98)		(-4.71)			
GlobalINVSENT	-0.0148		-0.0148		-0.0148		omitted	
	(-0.12)		(-0.60)		(-0.06)			
Breusch-Pagan LM test								
Hausman test								
Observations	145		145		145		145	
Multicollinearity (vif)								
Heteroskedasticity (χ^2 - Stat)								
Serial Correlation (F- stat)								
R-Squared	0.5689		0.5689		0.5689		0.9644	
Adjused R-Squared	0.5501		0.5501		0.5501		0.9629	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.9305
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.0356
N-1	144
N-p-1	138
	0.0371

Results of Panel Data Analysis - 5 Factor + GlobalINVSENT
Euro Zone Crisis - Hong Kong - Small Market Capitalisation

	Dependent Variables				Yes			
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects		OLS Firm Specific & Time	
Intercept	0.1127	***	0.1127	***	0.1127	**	0.0960	*
	(2.98)		(13.39)		(2.27)		(1.75)	
MRP	-1.6656	***	-1.6656	***	-1.6656	**	omitted	
	(-2.86)		(-15.37)		(-2.16)			
SMB	0.0202		0.0202		0.0202		omitted	
	(0.22)		(0.11)		(0.21)			
HML	-0.3130	***	-0.3130	***	-0.3130	***	omitted	
	(-2.76)		(-3.10)		(-2.52)			
Investment	0.0981		0.0981	***	0.0981		omitted	
	(1.48)		(6.71)		(1.15)			
Profitability	0.0903		0.0903		0.0903		omitted	
	(0.65)		(1.35)		(0.56)			
GlobalINVSENT	0.2362	*	0.2362	***	0.2362	**	omitted	
	(1.79)		(38.78)		(1.97)			
Breusch-Pagan LM test								
Hausman test								
Observations	155		155		155		155	
Multicollinearity (vif)								
Heteroskedasticity (χ^2 - Stat)								
Serial Correlation (F- stat)								
R-Squared	0.2754		0.2754		0.2754		0.5314	
Adjused R-Squared	(0.2460)		(0.2460)		(0.2460)		0.5124	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.0553
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.4686
N-1	154
N-p-1	148
	0.4876

Results of Panel Data Analysis - 5 Factor + GlobalINVSENT
Euro Zone Crisis - Taiwan - Small Market Capitalisation

	Dependent Variables				Yes			
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects		OLS Firm Specific & Time	
Intercept	0.2848	***	0.2848	***	0.2848	**	0.1940	***
	(4.90)		(14.01)		(2.47)		(13.51)	
MRP	-3.9684	***	-3.9684	***	-3.9684	**	omitted	
	(-4.67)		(-13.71)		(-2.32)			
SMB	-0.6348	***	-0.6348	***	-0.6348	**	omitted	
	(-5.40)		(-3.77)		(-2.53)			
HML	0.1007		0.1007	***	0.1007		omitted	
	(0.87)		(3.43)		(0.47)			
Investment	1.2860	***	1.2860	***	1.2860	***	omitted	
	(6.75)		(16.60)		(3.73)			
Profitability	-1.8950	***	-1.8950	***	-1.8950	***	omitted	
	(-7.27)		(-37.29)		(-3.96)			
GlobalINVSENT	0.5428	***	0.5428	***	0.5428	***	omitted	
	(3.78)		(9.25)		(9.25)			
Breusch-Pagan LM test								
Hausman test								
Observations	155		155		155		155	
Multicollinearity (vif)								
Heteroskedasticity (χ^2 - Stat)								
Serial Correlation (F- stat)								
R-Squared	0.5120		0.5120		0.5120		0.8959	
Adjused R-Squared	0.4922		0.4922		0.4922		0.8917	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.4305
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.1041
N-1	154
N-p-1	148
	0.1083

Results of Panel Data Analysis - 5 Factor + GlobalINVSENT
Euro Zone Crisis - China - Big Market Capitalisation

	Dependent Variables				Yes			
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects		OLS Firm Specific & Time	
Intercept	-0.0072		-0.0072	***	-0.0072		0.0200	***
	(-0.31)		(-3.17)		(-0.18)		(2.54)	
MRP	-0.0099		-0.0099		-0.0099		omitted	
	(-0.03)		(-0.29)		(-0.02)			
SMB	1.1119	***	1.1119	***	1.1119	***	omitted	
	(4.79)		(5.75)		(2.59)			
HML	0.6318	***	0.6318	***	0.6318	***	omitted	
	(5.24)		(59.73)		(3.86)			
Investment	0.5098	*	0.5098	***	0.5098		omitted	
	(1.87)		(19.30)		(0.69)			
Profitability	0.2264	*	0.2264	***	0.2264		omitted	
	(1.81)		(12.65)		(0.65)			
GlobalINVSENT	-0.3398	*	-0.3398	***	-0.3398		omitted	
	(-1.87)		(-9.90)		(-1.12)			
Breusch-Pagan LM test								
Hausman test								
Observations	145		145		145		145	
Multicollinearity (vif)								
Heteroskedasticity (χ^2 - Stat)								
Serial Correlation (F- stat)								
R-Squared	0.2534		0.2534		0.2534		0.9333	
Adjused R-Squared	0.2209		0.2209		0.2209		0.9304	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.9956
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.0667
N-1	144
N-p-1	138
	0.0696

Results of Panel Data Analysis - 5 Factor + GlobalINVSENT
Euro Zone Crisis - Hong Kong - Big Market Capitalisation

					Yes			
	Dependent Variables							
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects		OLS Firm Specific & Time	
Intercept	0.0486		0.0486	***	0.0486		0.0480	***
	(1.62)		(2.79)		(0.90)		(4.03)	
MRP	-0.6531		-0.6531	***	-0.6531		omitted	
	(-1.28)		(-2.80)		(-0.61)			
SMB	0.0498		0.0498		0.0498		omitted	
	(0.25)		(0.23)		(0.10)			
HML	0.3393	***	0.3393	***	0.3393		omitted	
	(2.81)		(4.34)		(1.32)			
Investment	0.0681		0.0681		0.0681		omitted	
	(0.45)		(0.89)		(0.20)			
Profitability	-0.2352		-0.2352	*	-0.2352		omitted	
	(-1.03)		(-1.77)		(-0.58)			
GlobalINVSENT	0.2122	***	0.2122	***	0.2122	**	omitted	
	(2.69)		(16.61)		(2.06)			
Breusch-Pagan LM test								
Hausman test								
Observations	155		155		155		155	
Multicollinearity (vif)								
Heteroskedasticity (χ^2 - Stat)								
Serial Correlation (F- stat)								
R-Squared	0.2539		0.2539		0.2539		0.7338	
Adjused R-Squared	0.2237		0.2237		0.2237		0.7230	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.7570
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.2662
N-1	154
N-p-1	148
	0.2770

Results of Panel Data Analysis - 5 Factor + GlobalINVSENT
Euro Zone Crisis - Taiwan - Big Market Capitalisation

	Dependent Variables			Yes			
	Pooled OLS		OLS Firm Specific Effects	OLS Time Effects		OLS Firm Specific & Time	
Intercept	0.2859	***	0.2859	0.2859	***	0.1440	***
	(5.49)		(48.78)	(2.93)		(13.19)	
MRP	-4.0968	***	-4.0968	-4.0968	***	omitted	
	(-5.35)		(-48.04)	(-2.80)			
SMB	0.4977	**	0.4977	0.4977		omitted	
	(2.32)		(2.98)	(1.03)			
HML	-0.2325	*	-0.2325	-0.2325		omitted	
	(-1.66)		(-9.22)	(-0.76)			
Investment	3.1164	***	3.1164	3.1164	***	omitted	
	(10.54)		(23.83)	(4.86)			
Profitability	-2.4662	***	-2.4662	-2.4662	***	omitted	
	(-10.99)		(-39.66)	(-5.66)			
GlobalINVSENT	0.4942	***	0.4942	0.4942	*	omitted	
	(3.79)		(14.87)	(1.78)			
Breusch-Pagan LM test							
Hausman test							
Observations	155		155	155		155	
Multicollinearity (vif)							
Heteroskedasticity (χ^2 - Stat)							
Serial Correlation (F- stat)							
R-Squared	0.5745		0.5745	0.5745		0.9738	
Adjused R-Squared	0.5573		0.5573	0.5573		0.9727	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.9978
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.0262
N-1	154
N-p-1	148
	0.0273

Results of Panel Data Analysis - 5 Factor + GlobalINVSENT
Global Financial Crisis - China - World Model

	Dependent Variables				Yes			
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects		OLS Firm Specific & Time	
Intercept	-0.0415	**	-0.0415	***	-0.0415		-0.1233	***
	(-2.17)		(-9.15)		(-0.49)		(-19.26)	
WMRP	0.0971		0.0971		0.0971		omitted	
	(0.28)		(1.26)		(0.06)			
WSMB	0.0061		0.0061	***	0.0061		0.0129	***
	(1.54)		(7.93)		(0.55)		(8.81)	
WHML	0.0661	***	0.0661	***	0.0661		-0.0666	***
	(3.75)		(18.61)		(0.94)		(-5.53)	
WInvestment	-1.2882	***	-1.2882	***	-1.2882	***	omitted	
	(-15.69)		(-51.13)		(-3.16)			
WProfitability	0.7295	***	0.7295	***	0.7295		omitted	
	(4.61)		(11.48)		(1.03)			
WGlobalINVSENT	-0.3031	***	-0.3031	***	-0.3031		omitted	
	(-2.62)		(-16.92)		(-0.61)			
Breusch-Pagan LM test								
Hausman test								
Observations	900		900		900		900	
Multicollinearity (vif)								
Heteroskedasticity (χ^2 - Stat)								
Serial Correlation (F- stat)								
R-Squared	0.2675		0.2675		0.2675		0.9541	
Adjused R-Squared	0.2626		0.2626		0.2626		0.9538	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	1.0000
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.0459
N-1	899
N-p-1	893
	0.0462

Results of Panel Data Analysis - 5 Factor + GlobalINVSENT
Global Financial Crisis - China - International Model

	Dependent Variables				Yes			
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects		OLS Firm Specific & Time	
Intercept	-0.0640	***	-0.0640	***	-0.0640		-0.1237	***
	(-3.82)		(-12.87)		(-0.88)		(-18.96)	
DMRP	7.5722	***	7.5722	***	7.5722	**	omitted	
	(10.52)		(30.51)		(2.33)			
DSMB	-3.8629	***	-3.8629	***	-3.8629	**	omitted	
	(-11.36)		(-15.82)		(-2.48)			
DHML	-0.8761	***	-0.8761	***	-0.8761		omitted	
	(-3.94)		(-7.58)		(-0.70)			
DInvestment	-0.9460	**	-0.9460	***	-0.9460		omitted	
	(-1.99)		(-6.85)		(-0.46)			
DProfitability	0.3170		0.3170	*	0.3170		omitted	
	(0.65)		(1.99)		(0.15)			
DGlobalINVSENT	1.0213	***	1.0213	***	1.0213		omitted	
	(6.43)		(22.31)		(1.50)			
FMRP	-4.6499	***	-4.6499	***	-4.6499	*	omitted	
	(-7.38)		(-33.83)		(-1.87)			
FSMB	-0.0084	**	-0.0084	***	-0.0084		0.0118	
	(-2.17)		(-9.83)		(-0.69)		(7.77)	
FHML	0.1054	***	0.1054	***	0.1054		-0.0683	
	(6.29)		(39.76)		(1.13)		(-5.50)	
FInvestment	-0.9474	***	-0.9474	***	-0.9474	***	omitted	
	(-11.02)		(-51.09)		(-2.83)			
FProfitability	-0.5795	***	-0.5795	***	-0.5795		omitted	
	(-2.70)		(-18.47)		(-0.68)			
FGlobalINVSENT	-0.2905	*	-0.2905	***	-0.2905		omitted	
	(-1.96)		(-7.38)		(-0.43)			
Breusch-Pagan LM test								
Hausman test								
Observations	900		900		900		900	
Multicollinearity (vif)								
Heteroskedasticity (χ^2 - Stat)								
Serial Correlation (F- stat)								
R-Squared	0.4937		0.4937		0.4937		0.9541	
Adjused R-Squared	0.4868		0.4868		0.4868		0.9535	

Test for the presence of fixed firm effect
Fixed Effect Model - F test (p-value) 0.9999

Test for the presence of time effect
Time Dummies - F test (p-value) 0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.0459
N-1	899
N-p-1	887
	0.0465

Results of Panel Data Analysis - 5 Factor + GlobalINVSENT
Global Financial Crisis - China - Domestics Model

Yes

	Dependent Variables Pooled OLS		OLS Firm Specific Effects		OLS Time Effects		OLS Firm Specific & Time	
Intercept	-0.0364	**	-0.0364	***	-0.0364		-0.1220	***
	(-2.20)		(-8.54)		(-0.50)		(-19.32)	
DMRP	1.2758	**	1.2758	***	1.2758		omitted	
	(2.10)		(7.86)		(0.41)			
DSMB	-4.4056	***	-4.4056	***	-4.4056	**	omitted	
	(-11.91)		(-19.30)		(-2.06)			
DHML	-0.1158		-0.1158		-0.1158		omitted	
	(-0.47)		(-1.21)		(-0.08)			
DInvestment	-4.2876	***	-4.2876	***	-4.2876	**	omitted	
	(-8.79)		(-33.93)		(-1.98)			
DProfitability	3.6933	***	3.6933	***	3.6933		omitted	
	(7.59)		(26.94)		(1.63)			
DGlobalINVSENT	0.4300		0.4300		0.4300		omitted	
	(2.47)		(10.84)		(0.61)			
Breusch-Pagan LM test								
Hausman test								
Observations	900		900		900		900	
Multicollinearity (vif)								
Heteroskedasticity (χ^2 - Stat)								
Serial Correlation (F- stat)								
R-Squared	0.2279		0.2279		0.2279		0.9541	
Adjused R-Squared	0.2227		0.2227		0.2227		0.9538	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	1.0000
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.0459
N-1	899
N-p-1	893
	0.0462

Results of Panel Data Analysis - 5 Factor + GlobalINVSENT
Global Financial Crisis - Hong Kong- World Model

	Dependent Variables			
				Yes
	Pooled OLS	OLS Firm Specific Effects	OLS Time Effects	OLS Firm Specific & Time
Intercept	0.1716 ***	0.1716 ***	0.1716 ***	-0.2094 ***
	(8.28)	(7.89)	(3.13)	(-13.98)
WMRP	-2.6864 ***	-2.6864 ***	-2.6864 ***	omitted
	(-7.02)	(-9.23)	(-2.90)	
WSMB	0.0116 ***	0.0116 ***	0.0116	0.0117 ***
	(2.71)	(3.40)	(1.09)	(3.04)
WHML	0.1019 ***	0.1019 ***	0.1019 *	-0.2251 ***
	(5.33)	(6.09)	(1.91)	(-9.42)
WInvestment	-1.7658 ***	-1.7658 ***	-1.7658 ***	omitted
	(-19.84)	(-16.66)	(-6.55)	
WProfitability	0.7879 ***	0.7879 ***	0.7879 **	omitted
	(4.59)	(3.72)	(1.97)	
WGlobalINVSENT	0.0580	0.0580	0.0580	omitted
	(0.46)	(0.55)	(0.23)	
Breusch-Pagan LM test				
Hausman test				
Observations	900	900	900	900
Multicollinearity (vif)				
Heteroskedasticity (χ^2 - Stat)				
Serial Correlation (F- stat)				
R-Squared	0.4176	0.4176	0.4176	0.5757
Adjused R-Squared	0.4137	0.4137	0.4137	0.5728

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.0000
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.

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1-R2	0.4243
N-1	899
N-p-1	893
	0.4272

Results of Panel Data Analysis - 5 Factor + GlobalINVSENT
Global Financial Crisis - Hong Kong- International Model

	Dependent Variables						Yes	
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects		OLS Firm Specific & Time	
Intercept	0.1293	***	0.1293	***	0.1293	***	-0.1821	***
	(4.86)		(5.81)		(2.91)		(-13.89)	
DMRP	-2.8742	***	-2.8742	***	-2.8742		omitted	
	(-2.64)		(-5.27)		(-1.42)			
DSMB	0.0088	**	0.0088	***	0.0088		0.0083	**
	(1.97)		(2.87)		(1.02)		(2.13)	
DHML	0.1078	***	0.1078	***	0.1078	**	-0.2279	***
	(5.31)		(9.29)		(2.27)		(-9.41)	
DInvestment	-1.4098	***	-1.4098	***	-1.4098	***	omitted	
	(-10.79)		(-7.71)		(-4.06)			
DProfitability	-0.6847	***	-0.6847		-0.6847		omitted	
	(-2.44)		(-1.54)		(-1.23)			
DGlobalINVSENT	0.5449	***	0.5449	***	0.5449		omitted	
	(3.02)		(3.25)		(1.55)			
FMRP	-1.3052	*	-1.3052	**	-1.3052		omitted	
	(-1.91)		(-2.07)		(-0.81)			
FSMB	-1.4755	***	-1.4755	***	-1.4755		omitted	
	(-3.80)		(-7.01)		(-1.69)			
FHML	-0.2004		-0.2004		-0.2004		omitted	
	(-0.73)		(-0.95)		(-0.30)			
FInvestment	-1.8777	***	-1.8777	***	-1.8777	**	omitted	
	(-3.97)		(-4.75)		(-2.08)			
FProfitability	1.5803	***	1.5803	***	1.5803	**	omitted	
	(4.02)		(4.77)		(2.08)			
FGlobalINVSENT	0.1568		0.1568		0.1568		omitted	
	(0.85)		(0.87)		(0.29)			
Breusch-Pagan LM test								
Hausman test								
Observations	900		900		900		900	
Multicollinearity (vif)								
Heteroskedasticity (χ^2 - Stat)								
Serial Correlation (F- stat)								
R-Squared	0.4600		0.4600		0.4600		0.5757	
Adjused R-Squared	0.4527		0.4527		0.4527		0.5700	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.0000
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.4243
N-1	899
N-p-1	887
	0.4300

Results of Panel Data Analysis - 5 Factor + GlobalINVSENT
Global Financial Crisis - Hong Kong- Domestics Model

	Dependent Variables						Yes	
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects		OLS Firm Specific & Time	
Intercept	0.0520	***	0.0520	***	0.0520		-0.1821	***
	(3.14)		(4.12)		(1.61)		(-13.89)	
DMRP	-1.7172	**	-1.7172	***	-1.7172		omitted	
	(-2.32)		(-3.75)		(-1.30)			
DSMB	0.0073	*	0.0073	**	0.0073		0.0083	**
	(1.73)		(2.26)		(0.82)		(2.13)	
DHML	0.0846	***	0.0846	***	0.0846		-0.2279	***
	(4.47)		(5.62)		(1.64)		(-9.41)	
DInvestment	-1.7326	***	-1.7326	***	-1.7326	***	omitted	
	(-15.63)		(-10.17)		(-6.31)			
DProfitability	-0.3392		-0.3392		-0.3392		omitted	
	(-1.30)		(-0.77)		(-0.76)			
DGlobalINVSENT	0.5581	***	0.5581	***	0.5581		omitted	
	(3.16)		(3.22)		(1.19)			
Breusch-Pagan LM test								
Hausman test								
Observations	900		900		900		900	
Multicollinearity (vif)								
Heteroskedasticity (χ^2 - Stat)								
Serial Correlation (F- stat)								
R-Squared	0.4456		0.4456		0.4456		0.5757	
Adjused R-Squared	0.4419		0.4419		0.4419		0.5728	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.0000

Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.4243
N-1	899
N-p-1	893
	0.4272

Results of Panel Data Analysis - 5 Factor + GlobalINVSENT
Global Financial Crisis - Taiwan - World Model

	Dependent Variables				Yes			
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects		OLS Firm Specific & Time	
Intercept	0.1363	***	0.1363	***	0.1363		-0.1566	***
	(3.84)		(3.84)		(1.63)		(-17.03)	
WMRP	-2.2365	***	-2.2365	***	-2.2365		omitted	
	(-3.41)		(-2.49)		(-1.43)			
WSMB	0.0111		0.0111	**	0.0111		0.0172	***
	(1.51)		(2.17)		(0.97)		(4.98)	
WHML	0.0338		0.0338	***	0.0338		-0.2903	***
	(1.03)		(6.04)		(0.66)		(-22.17)	
WInvestment	-1.3218	***	-1.3218	***	-1.3218	***	omitted	
	(-8.67)		(-3.94)		(-3.83)			
WProfitability	1.3082	***	1.3082	***	1.3082	*	omitted	
	(4.45)		(3.26)		(1.95)			
WGlobalINVSENT	-0.3336		-0.3336	***	-0.3336		omitted	
	(-1.55)		(-4.13)		(-0.82)			
Breusch-Pagan LM test								
Hausman test								
Observations	900		900		900		900	
Multicollinearity (vif)								
Heteroskedasticity (χ^2 - Stat)								
Serial Correlation (F- stat)								
R-Squared	0.0990		0.0990		0.0990		0.2803	
Adjused R-Squared	0.0930		0.0930		0.0930		0.2755	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.2876
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.7197
N-1	899
N-p-1	893
	0.7245

Results of Panel Data Analysis - 5 Factor + GlobalINVSENT
Global Financial Crisis - Taiwan - International Model

	Dependent Variables			
			Yes	
	Pooled OLS	OLS Firm Specific Effects	OLS Time Effects	OLS Firm Specific & Time
Intercept	0.1632 ***	0.1632 ***	0.1632 **	-0.1566 ***
	(4.87)	(15.47)	(2.04)	(-17.03)
DMRP	omitted	omitted	omitted	omitted
DSMB	-0.8351	-0.8351	-0.8351	omitted
	(-0.41)	(-0.88)	(-0.20)	
DHML	0.1119	0.1119	0.1119	omitted
	(0.06)	(0.08)	(0.03)	
DInvestment	-3.7926 ***	-3.7926 ***	-3.7926	omitted
	(-2.58)	(-2.92)	(-1.60)	
DProfitability	0.3573	0.3573	0.3573	omitted
	(0.17)	(0.51)	(0.10)	
DGlobalINVSENT	4.3908 ***	4.3908 ***	4.3908	omitted
	(2.45)	(10.22)	(0.93)	
FMRP	-3.1005 ***	-3.1005 ***	-3.1005 *	omitted
	(-4.27)	(-14.98)	(-1.87)	
FSMB	0.0086	0.0086 ***	0.0086	0.0172 ***
	(1.09)	(4.87)	(0.74)	(4.98)
FHML	0.0303	0.0303 ***	0.0303	-0.2905 ***
	(0.92)	(3.45)	(0.67)	(-22.22)
FInvestment	-1.2192 ***	-1.2192 ***	-1.2192 ***	omitted
	(-6.45)	(-29.37)	(-3.28)	
FProfitability	1.2392 ***	1.2392 ***	1.2392 *	omitted
	(4.06)	(26.81)	(1.87)	
FGlobalINVSENT	-0.4317 *	-0.4317 ***	-0.4317	omitted
	(-1.70)	(-4.82)	(-0.75)	
Breusch-Pagan LM test				
Hausman test				
Observations	900	900	900	900
Multicollinearity (vif)				
Heteroskedasticity (χ^2 - Stat)				
Serial Correlation (F- stat)				
R-Squared	0.1249	0.1249	0.1249	0.2803
Adjused R-Squared	0.1141	0.1141	0.1141	0.2706

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.2588
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.7197
N-1	899
N-p-1	887
	0.7294

Results of Panel Data Analysis - 5 Factor + GlobalINVSENT

	Dependent Variables				Yes	
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects	OLS Firm Specific & Time
Intercept	0.0164	*	0.0164	***	0.0164	-0.1528
	(1.75)		(8.87)		(8.87)	(-16.73)
DMRP	omitted		omitted		omitted	omitted
DSMB	-5.0736	***	-5.0736	***	-5.0736	omitted
	(-2.70)		(-5.22)		(-1.03)	
DHML	-1.9294		-1.9294		-1.9294	omitted
	(-1.02)		(-1.53)		(-0.43)	
DInvestment	-3.9374	***	-3.9374	***	-3.9374	omitted
	(-2.61)		(-2.97)		(-1.28)	
DProfitability	0.2661		0.2661		0.2661	omitted
	(0.13)		(0.52)		-0.05	
DGlobalINVSENT	-1.3734		-1.3734	***	-1.3734	omitted
	(-0.85)		(-3.31)		(-0.33)	
Breusch-Pagan LM test						
Hausman test						
Observations	900		900		900	900
Multicollinearity (vif)						
Heteroskedasticity (χ^2 - Stat)						
Serial Correlation (F- stat)						
R-Squared	0.0457		0.0457		0.0457	0.2803
Adjused R-Squared	0.0408		0.0408		0.0408	0.2755

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.3897
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1- \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.7197
N-1	899
N-p-1	893
	0.7245

Results of Panel Data Analysis - 5 Factor + GlobalINVSENT
Euro Zone Crisis - China - World Model

	Dependent Variables			Yes				
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects		OLS Firm Specific & Time	
Intercept	-5.3888	***	-5.3888	***	-5.3888	***	-4.1424	***
	(-67.88)		(-99.93)		(-15.06)		(-166.95)	
WMRP	26.1167	***	26.1167	***	26.1167	***	omitted	
	(20.94)		(28.23)		(4.87)			
WSMB	0.5674		0.5674		0.5674		omitted	
	(1.20)		(1.21)		(0.34)			
WHML	1.0705	**	1.0705	***	1.0705		omitted	
	(2.09)		(4.74)		(0.44)			
WInvestment	-1.5607	***	-1.5607	***	-1.5607		omitted	
	(-2.63)		(-8.27)		(-0.63)			
WProfitability	-0.9651	***	-0.9651	***	-0.9651		omitted	
	(-3.28)		(-12.55)		(-0.56)			
WGlobalINVSENT	1.0774	***	1.0774	***	1.0774		omitted	
	(2.61)		(8.30)		(0.67)			
Breusch-Pagan LM test								
Hausman test								
Observations	775		775		775		775	
Multicollinearity (vif)								
Heteroskedasticity (χ^2 - Stat)								
Serial Correlation (F- stat)								
R-Squared	0.4209		0.4209		0.4209		0.8704	
Adjused R-Squared	0.4164		0.4164		0.4164		0.8694	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	1.0000
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.1296
N-1	774
N-p-1	768
	0.1306

Results of Panel Data Analysis - 5 Factor + GlobalINVSENT
Euro Zone Crisis - China - International Model

	Dependent Variables Pooled OLS		OLS Firm Specific Effects		OLS Time Effects	OLS Firm Specific & Time
Intercept	-5.2987	***	-5.2987	***	-5.2987	-4.1424
	(-54.22)		(-74.11)		(-74.11)	(-166.95)
DMRP	9.5071	***	9.5071	***	9.5071	omitted
	(3.42)		(12.25)		(0.68)	
DSMB	2.9752	**	2.9752	***	2.9752	omitted
	(3.04)		(3.80)		(0.71)	
DHML	2.8040	**	2.8040	***	2.8040	omitted
	(2.15)		(3.27)		(0.45)	
DInvestment	-0.5924		-0.5924		-0.5924	omitted
	(-0.30)		(-1.20)		(-1.34)	
DProfitability	-3.2981	***	-3.2981	***	-3.2981	omitted
	(-6.12)		(-12.72)		(-0.07)	
DGlobalINVSENT	6.3994	***	6.3994	***	6.3994	omitted
	(6.56)		(41.72)		(1.76)	
FMRP	43.2376	***	43.2376	***	43.2376	omitted
	(11.37)		(18.48)		(2.18)	
FSMB	2.0736	**	2.0736	***	2.0736	omitted
	(2.11)		(3.28)		(0.51)	
FHML	0.3059		0.3059		0.3059	omitted
	(0.29)		(1.37)		(0.07)	
FInvestment	-3.5495	***	-3.5495	***	-3.5495	omitted
	(-4.73)		(-26.95)		(-1.16)	
FProfitability	0.4992		0.4992		0.4992	omitted
	(0.42)		(1.35)		(0.08)	
FGlobalINVSENT	0.9083		0.9083	***	0.9083	omitted
	(1.63)		(5.95)		(0.40)	
Breusch-Pagan LM test						
Hausman test						
Observations	775		775		775	775
Multicollinearity (vif)						
Heteroskedasticity (χ^2 - Stat)						
Serial Correlation (F- stat)						
R-Squared	0.3984		0.3984		0.3984	0.8704
Adjused R-Squared	0.3889		0.3889		0.3889	0.8684

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	1.0000
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{\text{adjusted}} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.1296
N-1	774
N-p-1	762
	0.1316

Results of Panel Data Analysis - 5 Factor + GlobalINVSENT
Euro Zone Crisis - China - Domestics Model

	Dependent Variables				Yes			
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects		OLS Firm Specific & Time	
Intercept	-4.7829	***	-4.7829	***	-4.7829	***	-4.1424	***
	(-61.79)		(-146.41)		(-13.70)		(-166.95)	
DMRP	31.2053	***	31.2053	***	31.2053	***	omitted	
	(12.51)		(25.91)		(2.60)			
DSMB	2.3664	***	2.3664	***	2.3664		omitted	
	(3.67)		(5.85)		(0.90)			
DHML	1.8242		1.8242	***	1.8242		omitted	
	(1.42)		(2.60)		(0.26)			
DInvestment	0.7932		0.7932	**	0.7932		omitted	
	(0.38)		(2.13)		(0.07)			
DProfitability	-1.5965	***	-1.5965	***	-1.5965		omitted	
	(-3.40)		(-12.71)		(-0.59)			
DGlobalINVSENT	3.9868	***	3.9868	***	3.9868		omitted	
	(4.01)		(21.34)		(1.12)			
Breusch-Pagan LM test								
Hausman test								
Observations	775		775		775		775	
Multicollinearity (vif)								
Heteroskedasticity (χ^2 - Stat)								
Serial Correlation (F- stat)								
R-Squared	0.2229		0.2229		0.2229		0.8704	
Adjused R-Squared	0.2169		0.2169		0.2169		0.8694	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	1.0000

Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.1296
N-1	774
N-p-1	768
	0.1306

Results of Panel Data Analysis - 5 Factor + GlobalINVSENT
Euro Zone Crisis - Hong Kong - World Model

	Dependent Variables			
	Pooled OLS	OLS Firm Specific Effects	OLS Time Effects	OLS Firm Specific & Time
Intercept	0.0056	0.0056	0.0056	0.0456 **
	(0.22)	(0.26)	(0.09)	(2.09)
WMRP	-0.0658	-0.0658	-0.0658	omitted
	(-0.17)	(-0.22)	(-0.06)	
WSMB	-0.4125 ***	-0.4125 ***	-0.4125	omitted
	(-2.76)	(-2.36)	(-1.03)	
WHML	0.6764 ***	0.6764 ***	0.6764	omitted
	(4.17)	(3.32)	(1.61)	
WInvestment	-0.105	-0.105	-0.105	omitted
	(-0.56)	(-0.35)	(-0.21)	
WProfitability	-0.5578 ***	-0.5578 ***	-0.5578 **	omitted
	(-5.99)	(-7.75)	(-2.12)	
WGlobalINVSENT	0.8336 ***	0.8336 ***	0.8336 ***	omitted
	(6.38)	(3.62)	(2.67)	
Breusch-Pagan LM test				
Hausman test				
Observations	775	775	775	775
Multicollinearity (vif)				
Heteroskedasticity (χ^2 - Stat)				
Serial Correlation (F- stat)				
R-Squared	0.1199	0.1199	0.1199	0.2979
Adjused R-Squared	0.1130	0.1130	0.1130	0.2924

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.1065

Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.7021
N-1	774
N-p-1	768
	0.7076

Results of Panel Data Analysis - 5 Factor + GlobalINVSENT
Euro Zone Crisis - Hong Kong - International Model

	Dependent Variables				Yes		
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects		OLS Firm Specific & Time
Intercept	0.0358	*	0.0358	*	0.0358		0.0456
	(1.66)		(1.85)		(0.90)		(0.0218)
DMRP	3.0393	**	3.0393	***	3.0393		omitted
	(2.19)		(3.86)		(1.16)		
DSMB	0.3511		0.3511		0.3511		omitted
	(1.46)		(1.55)		(0.74)		
DHML	0.1568		0.1568		0.1568		omitted
	(0.55)		(0.54)		(0.31)		
DInvestment	0.2691		0.2691		0.2691		omitted
	(1.17)		(1.00)		(0.59)		
DProfitability	-0.7089	***	-0.7089	***	-0.7089	***	omitted
	(-4.84)		(-9.84)		(-2.80)		
DGlobalINVSENT	1.0499	***	1.0499	***	1.0499	***	omitted
	(5.95)		(3.10)		(3.14)		
FMRP	-1.7841	**	-1.7841	***	-1.7841		omitted
	(-2.11)		(-2.58)		(-1.34)		
FSMB	0.3283		0.3283	***	0.3283		omitted
	(1.21)		(2.81)		(0.67)		
FHML	2.8443	***	2.8443	***	2.8443	***	omitted
	(7.30)		(10.14)		(3.80)		
FInvestment	-3.1693	***	-3.1693	***	-3.1693	***	omitted
	(-5.01)		(-7.51)		(-3.04)		
FProfitability	omitted		omitted		omitted		omitted
FGlobalINVSENT	0.2402		0.2402		0.2402		omitted
	(0.82)		(1.52)		(0.35)		
Breusch-Pagan LM test							
Hausman test							
Observations	775		775		775		775
Multicollinearity (vif)							
Heteroskedasticity (χ^2 - Stat)							
Serial Correlation (F- stat)							
R-Squared	0.1753		0.1753		0.1753		0.2979
Adjused R-Squared	0.1634		0.1634		0.1634		0.2868

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.0696
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.7021
N-1	774
N-p-1	762
	0.7132

Results of Panel Data Analysis - 5 Factor + GlobalINVSENT
Euro Zone Crisis - Hong Kong - Domestic Model

	Dependent Variables				Yes			
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects		OLS Firm Specific & Time	
Intercept	-0.0055		-0.0055		-0.0055		0.0456	***
	(-0.28)		(-0.39)		(-0.13)		(2.13)	
DMRP	0.3623		0.3623		0.3623		omitted	
	(0.41)		(0.78)		(0.20)			
DSMB	0.2515		0.2515		0.2515		omitted	
	(1.21)		(1.23)		(0.45)			
DHML	-0.1208		-0.1208		-0.1208		omitted	
	(-0.46)		(-0.39)		(-0.20)			
DInvestment	-0.0479		-0.0479		-0.0479		omitted	
	(-0.22)		(-0.18)		(-0.08)			
DProfitability	-0.5397	***	-0.5397	***	-0.5397	*	omitted	
	(-4.93)		(-6.15)		(-1.73)			
DGlobalINVSENT	0.8226	***	0.8226	***	0.8226	**	omitted	
	(5.16)		(2.54)		(2.13)			
Breusch-Pagan LM test								
Hausman test								
Observations	775		775		775		775	
Multicollinearity (vif)								
Heteroskedasticity (χ^2 - Stat)								
Serial Correlation (F- stat)								
R-Squared	0.0822		0.0822		0.0822		0.2979	
Adjused R-Squared	0.0750		0.0750		0.0750		0.2924	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.1397
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.7021
N-1	774
N-p-1	768
	0.7076

Results of Panel Data Analysis - 5 Factor + GlobalINVSENT

Euro Zone Crisis - Taiwan - World Model

	Dependent Variables				Yes		
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects		OLS Firm Specific & Time
Intercept	0.0064		0.0064		0.0064		0.1540
	(0.47)		(1.13)		(0.19)		(18.27)
WMRP	-0.2099		-0.2099	***	-0.2099		omitted
	(-0.98)		(-2.50)		(-1.00)		
WSMB	-0.4451	***	-0.4451	***	-0.4451	**	omitted
	(-5.49)		(-12.02)		(2.22)		
WHML	1.0286	***	1.0286	***	1.0286		omitted
	(11.69)		(32.78)		(-0.95)		
WInvestment	-0.4095	***	-0.4095	***	-0.4095	**	omitted
	(-4.01)		(-9.38)		(-2.35)		
WProfitability	-0.4930	***	-0.4930	***	-0.4930	*	omitted
	(-9.77)		(-18.20)		(1.79)		
WGlobalINVSENT	0.5574	***	0.5574	***	0.5574		omitted
	(7.87)		(23.02)		(0.10)		
Breusch-Pagan LM test							
Hausman test							
Observations	775		775		775		775
Multicollinearity (vif)							
Heteroskedasticity (χ^2 - Stat)							
Serial Correlation (F- stat)							
R-Squared	0.3120		0.3120		0.3120		0.8677
Adjused R-Squared	0.3066		0.3066		0.3066		0.8667

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.9999
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where

R^2 = sample R-square

p = Number of predictors

N = Total sample size.

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1-R2	0.1323
N-1	774
N-p-1	768
	0.1333

Results of Panel Data Analysis - 5 Factor + GlobalINVSENT
Euro Zone Crisis - Taiwan - International Model

	Dependent Variables				Yes			
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects		OLS Firm Specific & Time	
Intercept	-0.1281	***	-0.1281		-0.1281	**	0.1540	***
	(-7.21)		(-11.83)		(-2.12)		(18.63)	
DMRP	17.1889	***	17.1889		17.1889	***	omitted	
	(9.32)		(17.40)		(2.94)			
DSMB	6.2399	***	6.2399		6.2399	**	omitted	
	(6.03)		(13.34)		(2.43)			
DHML	-6.0161	***	-6.0161	***	-6.0161	***	omitted	
	(-7.49)		(-5.67)		(-2.71)			
DInvestment	-5.3239	***	-5.3239	***	-5.3239	**	omitted	
	(-6.83)		(-9.11)		(-2.05)			
DProfitability	-1.1395		-1.1395	**	-1.1395		omitted	
	(-0.90)		(-2.13)		(-0.21)			
DGlobalINVSENT	-7.8361	***	-7.8361	***	-7.8361		omitted	
	(-6.10)		(-12.73)		(-1.42)			
FMRP	-0.8000	***	-0.8000	***	-0.8000		omitted	
	(-4.37)		(-10.53)		(-0.98)			
FSMB	-0.0390		-0.0390		-0.0390		omitted	
	(-0.49)		(-1.09)		(-0.10)			
FHML	1.0279	***	1.0279	***	1.0279	**	omitted	
	(10.75)		(25.54)		(2.25)			
FInvestment	-0.6453	***	-0.6453	***	-0.6453		omitted	
	(-3.97)		(-10.10)		(-0.81)			
FProfitability	-0.2848	***	-0.2848	***	-0.2848	**	omitted	
	(-6.51)		(-9.32)		(-2.21)			
FGlobalINVSENT	1.0325	***	1.0325	***	1.0325	***	omitted	
	(13.66)		(29.55)		(3.96)			
Breusch-Pagan LM test								
Hausman test								
Observations	775		775		775		775	
Multicollinearity (vif)								
Heteroskedasticity (χ^2 - Stat)								
Serial Correlation (F- stat)								
R-Squared	0.5323		0.5323		0.5323		0.8677	
Adjused R-Squared	0.5249		0.5249		0.5249		0.86684	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	0.9967
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.1323
N-1	774
N-p-1	769
	0.13316

Results of Panel Data Analysis - 5 Factor + GlobalINVSENT
Euro Zone Crisis - Taiwan - Domestic Model

	Dependent Variables				Yes			
	Pooled OLS		OLS Firm Specific Effects		OLS Time Effects		OLS Firm Specific & Time	
Intercept	-0.0478	***	-0.0478	***	-0.0478		0.1540	***
	(-2.85)		(-5.49)		(-1.13)		(18.27)	
DMRP	4.6018	***	4.6018	***	4.6018		omitted	
	(2.68)		(5.41)		(1.03)			
DSMB	11.7985	***	11.7985	***	11.7985	***	omitted	
	(10.17)		(25.39)		(5.63)			
DHML	-3.3389	***	-3.3389	***	-3.3389	***	omitted	
	(-3.73)		(-3.75)		(-2.58)			
DInvestment	-2.6305	***	-2.6305	***	-2.6305		omitted	
	(-3.28)		(-6.68)		(-0.91)			
DProfitability	-3.4895	***	-3.4895	***	-3.4895		omitted	
	(-3.86)		(-13.19)		(-0.88)			
DGlobalINVSENT	1.6245	*	1.6245	***	1.6245		omitted	
	(1.92)		(6.06)		(0.39)			
Breusch-Pagan LM test								
Hausman test								
Observations	775		775		775		775	
Multicollinearity (vif)								
Heteroskedasticity (χ^2 - Stat)								
Serial Correlation (F- stat)								
R-Squared	0.2031		0.2031		0.2031		0.8677	
Adjused R-Squared	0.1968		0.1968		0.1968		0.8667	

Test for the presence of fixed firm effect	
Fixed Effect Model - F test (p-value)	1.0000
Test for the presence of time effect	
Time Dummies - F test (p-value)	0.0000

$$R^2_{adjusted} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

where
R^2 = sample R-square
p = Number of predictors
N = Total sample size.
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1-R2	0.1323
N-1	774
N-p-1	768
	0.1333