Value versus Growth in the Asian Equity Markets

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Declaration of Copyright

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Abstract

There has been considerable empirical research on style investment in the United States and a fair amount in Europe but relatively little published research in the Asian markets. It is commonly believed that fundamental stock valuation and style analysis works only in developed markets like the United States and that more qualitative methods should be used in inefficient markets such as Asia (including developed economies and emerging economies in Asia). We therefore determine whether style investment strategies can be applied consistently in the Asian Equity Markets. Our study encompasses markets in developed Asia which includes Japan, Hong Kong and Singapore as well as markets in emerging Asia comprising Indonesia, Korea, Malaysia, Philippines, Taiwan and Thailand.

We also investigate the significance of the theoretical drivers behind the valuation ratios which are used as proxies for classifying value and growth stocks. The traditional valuation ratios, which are influenced by the 'Price' factor, may contain systematic errors and may not reflect the underlying intrinsic valuations of both value and growth companies. This raises the question whether they are valid ratios for screening value and growth stocks. We therefore analyse a style investment strategy using a combination of theoretical drivers of the proxies based on historical data or a mix of historical and forecast data.

We also investigate the reasons behind the existence of 'value-growth premiums'. We focus on elements of behavioural finance based on expectational error to explain the superior performance of value strategies. There may be many different sources of expectational error which range from investors and analysts extrapolating past earnings/sales growth too far into the future, to reliance on analysts' earnings forecasts, to portfolio flows or various cognitive errors/research biases. To date, there has not been a consensus on the sources of extreme expectations. Our thesis determines whether extreme expectations are driven by extrapolation of past performance, portfolio flows and/or analysts' forecast errors to explain the value/growth effect.

The results of the thesis aim to provide a deeper understanding of style investment in the Asian Equity Markets and enable a fund manager to better implement active style strategies.

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1.1 Introduction and Research Motivation

During my years as a Fund Manager in Singapore and then in London I had responsibilities which included building quantitative models for Asian Markets and selecting stocks for Emerging Market and Small Capitalisation equity products. As a part of my work, I observed a popular anomaly attracting significant attention amongst investment theory academics and stock market practitioners. This anomaly is the 'value/growth' effect in the equity markets. Empirical research in finance has shown that value investment strategies produce superior average long term performance over growth investment strategies. Strategies that are long on stocks with low prices relative to book values (P/B), earnings (P/E), cash flows (P/CF), sales (P/Sales), dividends (P/D) and other fundamental measures ('value stocks') have higher average returns than stocks with high prices relative to book values, earnings, cash flow, sales, dividends and other fundamental measures ('growth stocks'). Academic development of the value/growth concept and the general conclusion that significant profits can be made by value/growth effects have resulted in the emergence of investment styles in the investment and investment consulting community. In the investment community, we have seen the allocation of assets extending beyond the 'vanilla' domestic and international equity mix to include value and growth styles allocation.

Value and growth investment styles have distinct features. A value investor believes that the current value of a stock is lower than its intrinsic value. The value investor therefore hopes to gain from an upsurge in the stock price when the market realises that the current stock price is undervalued. A growth investor on the other hand believes that expected future earnings are not fully reflected in the current stock price. Therefore, the growth investor relies on the expectation that crystallisation of future earnings will drive up the stock price over a period of time.

The abnormal returns generated from value strategies contradict the efficient market hypothesis and various equilibrium asset pricing models. Market observers have interpreted the value/growth effect as evidence of market inefficiency or failure of the standard Capital Asset Pricing Model (CAPM) to explain the cross section of stock returns.

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This results in two schools of thought offering an explanation of the success of value strategies. The first based on the Fama and French (1995, 1996) argument that the superior return of value stocks represents risk compensation missed by CAPM. Mis-specifications of equilibrium pricing model such as CAPM can be attributed to omitted risk factors, or due to the failure to account for the stochastic behaviour of betas and the risk premium. It is believed that a correctly specified asset pricing model should be able to explain these anomalies consistent with the rational, efficient pricing in equity markets. However, it is acknowledged that it is very difficult to determine whether an equilibrium pricing model is correctly specified. As a result, it is very difficult to distinguish and attribute anomalies to either an incorrectly specified asset pricing model or market inefficiency. The other explanation by default is based on Lakonishok, Shleifer and Vishny (1994) argument which relies on some form of market inefficiency and elements of behavioural finance paradigm to explain this phenomenon called 'Expectational Error'. Value strategies based on financial ratios have predictive powers because they capture systematic errors in the way that both investors and analysts form expectations about future growth opportunities.

The use of style investment in active equity management strategies requires the need for a greater understanding of value and growth styles; more importantly, the variables that drive value and growth styles. Traditionally, value and growth stocks tend to be simplistically classified using isolated valuation ratios such as P/B, P/E, P/Sales and P/D. Stocks with low values for P/B, P/E, P/Sales and P/D ratios are classified as value stocks and vice versa for growth stocks. This method of classification assumes that 'value' is opposite to 'growth' and every stock must belong to either value or growth. It does not distinguish between value stocks from 'low' growth stocks as they are classified as pure value or pure growth stocks.

Moreover, since low values for these ratios often result from low stock prices (as the stock price is a numerator in the ratio), then value stocks are often considered cheap stocks while growth stocks are considered expensive stocks; regardless of the growth prospects of the underlying firms. In an efficient market, it is possible that growth stocks may be expensive as their prices inevitably reflect their underlying growth opportunities. However, not every expensive stock is a growth stock and not every cheap stock is a value stock.

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Inadequate definitions of financial ratios such as P/B, P/E, P/CF and P/Sales for value and growth stocks used by the benchmark providers and some academics had hampered the ability to understand the characteristics of growth and value investing styles. It is only recently that a number of global style indices have been enhanced using a combination of value and growth factors for the classification of the respective indices. Value and growth investment styles have different unique features driven by unique financial variables.
In order for a investment manager to have an active style strategy, it is imperative to identify factors that can capture the intrinsic underlying fundamentals of a company, its growth prospects and its stock specific risks that not only meet the characteristics of value and growth styles but outperform the recently enhanced style benchmarks.

During my perusal of academic investment material over the last few years, it became apparent to me that while there has been considerable empirical research into this phenomenon predominantly in the United States and a fair amount in Europe; there has been relatively little published research on the value/growth effect in the Asian markets.

In the succeeding chapters, our study therefore determine whether style investment strategies can be applied in the Asian Equity Markets. We also investigate the significance of the theoretical drivers which explain the variability of valuation ratios which are used as proxies for classifying value and growth stocks. We further determine whether an investment strategy which uses the combination of theoretical drivers based on historical data or a mix of historical and forecast data is a better predictor of future returns of value and growth stocks as compared to an investment strategy which uses valuation ratios based on single factor variables (such as P/B, P/E, P/Sales and P/D). We also determine the explanations behind the value/growth effect. A deeper understanding of the interpretation of the variation of returns for value and growth strategies will hopefully enable style based fund managers, such as myself, devise active strategies to optimise returns against the style benchmarks in the Asian Markets.

It has to be noted that the empirical findings of this thesis are subject to certain limitations which are described in detail in Chapter 8.

1.2 Objectives and Overview of Thesis

This thesis focuses on Asian Equity Markets both developed Asia (Japan, Hong Kong, Singapore) and markets in emerging Asia (Indonesia, Korea, Malaysia, Philippines, Taiwan and Thailand).The main objectives of this thesis are summarised as follows:

a To determine whether style investment strategies can be applied in the Asian Equity Markets. (Chapter 4)

b To investigate the significance of the theoretical drivers which explain the variability of valuation ratios such as P/B, P/E, P/Sales and P/D which are used as proxies for classifying value and growth stocks. (Chapter 5)

c To investigate whether an investment strategy which uses the combination of theoretical drivers based on historical data or a mix of historical and forecast data is a better predictor of future returns of value and growth stocks as compared to an investment strategy which uses valuation ratios based on single factor variables (such as P/B, P/E, P/Sales and P/D). We also determine whether the performances of value and growth portfolios constructed using the above strategy based on theoretical drivers exceed the performances of commonly used benchmarks such as MSCI/Citigroup Indices. (Chapter 5)

d To determine whether extrapolation of past performance causes mispricing in value and growth stocks which explain the variation in performance between value and growth strategies. (Chapter 6)

e To determine whether portfolio flows or reliance on analysts' forecast errors can explain the value/growth effect. We analyse the impact of net foreign portfolio flows and analysts' forecast errors (positive and negative errors) independently as well as jointly on the performance of value and growth stocks in the Asian Equity Markets. (Chapter 7)

We begin the thesis with Chapter 2 where we review academic studies by Basu (1977,1983), Ball (1978), Lakonishok, Shleifer and Vishny (1994), Fama and French (1992, 1998), Barbee, Mukherji and Raines (1986), Rozeff (1984), etc that document the significant cross-sectional relationship between stock returns and valuation ratios.
The conclusions that stock returns are predictable and significant profits can be made by the value/growth effects led to the emergence of style based investment strategies by the

investment community. Chapter 2 reviews studies that document the predictability of stock returns in both the Western developed and Asian equity markets based on valuation ratios. We analyse the differences in performances of value strategies in Asian equity markets compared to Western developed markets; specifically we explore whether there are differences between Asian Markets and Western developed markets in terms of size of spreads and importance of variables driving the common stock returns. We also review various rational and irrational pricing theories as possible explanations behind the value/growth anomaly.

Chapter 3 explains the methods employed for the collection and organisation of data for this thesis.

Chapter 4 determines whether style investment strategies can be applied in the Asian Equity Markets. The Asian market is perceived as a 'market where investors ignore basic fundamentals such as earnings, corporate growth, etc. It is a market driven by floods of money; a market that trades at mind boggling levels." The little amount of research published in Asia does show that stock returns can be predicted by valuation ratios. However, there have been doubts as to whether fundamental stock valuation and style analysis evolved in developed western equity markets can be applied consistently to inefficient markets like Asia.

We use the commonly used valuation ratios such as price-to-book (P/B), price-to-earnings (P/E), price-to-cash flow (P/CF), price-to-sales (P/Sales) and inverse of dividend yield (P/D) to determine whether they are good predictors of stock returns in the Asian Equity Markets. In order to test the robust predictive powers of the valuation ratios, we also determine whether the value premiums are consistent across markets and across time such as times of bull or bear market periods. We also analyse whether the superiority of the value strategy is attributable to the small-firm effect since a number of markets particularly in Asia have their stock markets dominated by a few large capitalisation stocks and numerous small capitalisation stocks. Most academic studies have relied on results based on the performance of equal-weighted portfolios. However, the nature of the stock markets in Asia driven by a few very large companies may cause the results based on market capitalisation weighted portfolios to differ. Therefore, we analyse the returns of portfolios based on both market capitalisation and on an equal weighted basis.

Our findings show significant cross-sectional relationship between the valuation ratios and stock returns with noteworthy performance driven by P/E ratio. The results show that size plays a role in the superior performance of value stocks. Further analysis show that value stocks consistently outperform growth stocks but the value premiums are skewed towards periods of stock market decline.

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Chapter 5 thus investigates the significance of the theoretical drivers which explain the variability of valuation ratios which are used as proxies for classifying value and growth stocks. Multivariate cross-sectional regressions show that the theoretical drivers of the proxies based on a combination of variables – company fundamentals, expectations of growth and stock specific risks; all have joint roles in explaining the variability of P/B, P/E, P/Sales and P/D. However, some variables have more prominent roles than others in explaining the variability of P/B, P/E, P/Sales and P/D. The prominent roles of some of the theoretical drivers of the proxies contain both value and growth characteristics which help provide some plausible explanations behind the use of these valuation ratios as classification measures for both value and growth stocks.

The traditional single factor valuation ratios, which are influenced by the 'Price' factor, may be biased with overoptimistic or overpessimistic assumptions. As a result these ratios may not reflect the true growth prospects of companies and thus the underlying intrinsic valuations of both value and growth companies.

We therefore analyse in Chapter 5 whether an investment strategy which uses the combination of theoretical drivers based on historical data or a mix of historical and forecast data is a better predictor of future returns of value and growth stocks compared to an investment strategy which uses valuation ratios based on single factor variables such as P/B, P/E, P/Sales and P/D.
We further determine the combination of theoretical drivers (based on historical data or a mix of historical and forecast data) that maximises the performance of value and growth stocks.

The results in Chapter 5 show that growth investment strategies based on the theoretical drivers using a combination of historical and forecast data generally exceed the performance of growth strategies using respective single factor valuation ratios (P/B, P/E, P/Sales or P/D) both on an absolute and risk adjusted basis. These growth strategies using the theoretical drivers outperform both the MSCI and Citigroup Growth Indices. However, we are not able to make similar conclusions for value strategies based on the theoretical drivers. Value strategies based on theoretical drivers show comparable performance against value portfolios selected using counterpart single factor variables but outperform both the MSCI and Citigroup Value Indices.

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Single factor valuation ratios which are used as proxies for classifying value and growth stocks are influenced by the 'Price' factor. The 'Price' factor is driven by market expectations and investor behaviour which may be overly optimistic or pessimistic. Our results based on an investment strategy using fundamental theoretical drivers confirm that the valuation ratios relying on the 'Price' factor is not the most accurate proxy especially for growth stocks. Single factor valuation ratios for growth stocks, influenced by the 'Price' factor, comprises high expectations of the underlying prospects for the firms. This drives the share prices higher whilst minimising their upside returns. Our strategies for growth stocks on the other hand are based on the theoretical drivers using a combination of historical and forecast data. This provides a more realistic valuation of the firms without being influenced to a large extent by subjective judgement. Hence, the strategy based on theoretical drivers is a better predictor of future returns for growth stocks. Our investment strategies based on theoretical drivers for both value and growth stocks have expanded the distinction between growth and value beyond that of the industry norm of defining such stocks based on 'expensive' and 'cheap' definitions.

Although research has shown that value strategies generate superior performance, the interpretation of variation of returns related to value and growth strategies has been controversial. There are two major schools of thought offering an explanation on the success of value strategies. The first uses the Fama and French (1995, 1996) argument that superior return of value stocks represents risk compensation consistent with rational efficient pricing in equity markets. The other uses the Lakonishok, Shleifer and Vishny (1994) argument which relies on some form of market inefficiency and elements of the behavioural finance paradigm to provide alternative explanations behind the value/growth effect. Systematic errors in the way that both investors and analysts form expectations about future growth opportunities have been proposed as an explanation behind the value/growth effect. Expectational errors cause a certain degree of mis-pricing which makes value stocks under-priced and growth stocks overpriced. The correction of mispricing of growth opportunities explains the superior performance of value strategies.

Our empirical results in Chapter 4, based on risk adjusted returns and consistency in performance of value/growth strategies in both bull/bear markets, do not support the Fama and French argument that the superior performance of value strategies in Asian Equity Markets is due to risk compensation. Therefore, we focus on elements of behavioural finance based on expectational error in Chapters 6 and 7 to establish a deeper understanding of the interpretation of the variation of returns for value and growth strategies.

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There may be many different sources of extreme expectations that cause overreaction. Overreaction may range from investors and analysts naively extrapolating past earnings/sales growth too far into the future, to reliance on analysts' forecasts which are systematically biased, to portfolio flows, to various cognitive errors or to research biases. Although a number of studies support the expectational error hypothesis, there has not been a common consensus on the sources of extreme expectations that cause overreaction among investors and analysts.

Chapter 6 attempts to determine whether extreme expectations caused by extrapolating past performance explain the superior performance of value strategies. We use two measures to proxy past performance: past growth in earnings and historical price performance.
Using different definitions of value and growth, we analyse the evolution of earnings growth and price performance around portfolio formation to determine whether mean-reversion patterns are displayed consistent with the extrapolation hypothesis. We further perform tests to determine whether investors have been deluded by the previous record of value (growth) companies and underprice (overprice) the companies despite mean-reversion in growth rates to the extent that the correction of mispricing growth opportunities explains the subsequent performance differential between value and growth strategies.

Although preliminary evidence in our results show mean-reversion patterns in price performance and earnings growth for both value and growth portfolios, statistical tests are not consistent with the view that the source of extreme expectations by investors is driven by extrapolation of past performance as suggested by Lakonishok et al (1994). The results suggest that strategies which are contrarian to extrapolation of past performance are not able to explain the value/growth effect.

Chapter 7 therefore further explores whether other behavioural factors such as investor sentiment based on portfolio flows or reliance on analysts' forecasts can explain the value/growth effect.

Overreaction may also be caused by portfolio flows. Empirical and academic studies by Harris and Gurel (1986), Shleifer (1986), Jegadeesh and Titman (1993) and Warther (1995) suggest that there is a link between portfolio flows and stock market returns. Studies show evidence that stock prices overreact to portfolio flows - once 'price pressure' or investor sentiment wave has passed; stock returns exhibit reversals to levels in line with the fundamental value of underlying stocks. Excessive positive portfolio flows and negative portfolio flows causes a certain degree of mispricing in the equity markets which underprices value stocks and overprices growth stocks. Price pressure and extrapolation hypothesis are similar as they predict that returns are mean reverting and strategies that exploit the mispricing in stock returns produce abnormal returns which may explain the superior returns of underpriced and ignored 'value' stocks.

Academic research by La Porta (1996), Dechow and Sloan (1997), Levis and Liodakis (2001) have shown that investors make systematic errors on stock pricing driven by reliance on analysts' forecasts. Research shows that stock prices incorporate analysts' forecasts of earnings growth. The investor realisation of actual earnings per share figures following excessive reliance on analysts' optimism for growth stocks and pessimism for value stocks creates positive surprises for value stocks. This results in upside price movement for value stocks and downward price movement for growth stocks which explains the value/growth effect.

Chapter 7 investigates the impact of net foreign portfolio flows and analysts' forecast errors independently as well as jointly on the performance of value and growth stocks in the Asian Equity Markets using time-series regressions to determine an explanation behind the value/growth effect. We make use of net foreign portfolio flows in our analysis as a large number of Asian Equity markets in our sample universe tend to be dominated by foreign portfolio flows because their domestic institutional and retail markets are still relatively small. Many of these markets have relatively immature domestic investment frameworks. The domestic equity markets in each of these countries tend to be skewed towards retail investors. The pension funds are traditionally state managed in most of Asia and have a bias towards ownership of bonds rather than equities. Thus, these markets are subject to the behavioural patterns of international investors defined by foreign portfolio flows as documented by Bekaert and Harvey (2003), Bekaert, Harvey and Lumsdaine (2002).

Our results show positive relationship between portfolio flows and returns for both value and growth portfolios. We also find that analysts are on average more optimistic on growth expectations of value stocks than growth stocks. As a result, positive forecast errors as a standalone variable does not have a significant impact on the returns of value stocks while having a bigger and significant impact on the performance of growth stocks. On the other hand, negative forecast errors have a significant impact on the performance of growth stocks but do not have a significant impact on the performance value stocks despite the over-optimism of analysts' expectations. We also find that a combination of analysts' forecast errors and portfolio flows do explain some of the value/growth effect.

In the last chapter, Chapter 8, we summarise the empirical findings from the thesis and draw the main conclusions. Finally, the limitations of this study are emphasised and we make some suggestions for further research.

Chapter 2
Literature Review

Chapter 2 – Literature Review

2.1 Introduction

One of the most popular anomalies that have attracted considerable attention among academics and practitioners is the value/growth effect.

The abnormal returns that are generated from the value strategies contradict various asset pricing models. They have been interpreted by market observers as evidence of market inefficiency or failure of the standard Capital Asset Pricing Model (CAPM) to explain the cross section of stock returns.

In an efficient market, prices follow a random-walk process as information arrive randomly impacting stock prices. The condition for the existence of the efficient market hypothesis is that the expected excess returns equal zero. The actual asset returns fluctuate randomly about the expected equilibrium return.

There are two schools of thought offering an explanation on the success of value strategies. The first relies on the rational efficient pricing of equity markets while the other explanation relies on the behavioural paradigm and some form of market inefficiency.

Section 2.2 reviews recent studies that document significant cross-section relationship between stock returns in the Western developed equity markets and valuation ratios. Section 2.3 presents the literature on the existence of value/growth effect in markets outside the developed markets of the United States and Europe; primarily focusing on Asian Equity markets. More importantly, we analyse the differences in performances of value strategies in these markets compared to the developed markets. Section 2.4 examines the interaction between value and size-based effects. Various rational and irrational pricing theories are highlighted in Section 2.5 as possible explanations behind the value/growth effect.

2.2 Value/Growth Effect: Empirical Evidence in Western Developed Equity Markets

Basu (1977) showed empirically that the investment performance of common stocks is related to their P/E ratios. In fact, the results of his studies violate the laws of market efficiency and CAPM.
The results based on a universe of New York Stock Exchange (NYSE) firms showed significant negative relationship between P/E ratios and risk adjusted average returns. A strategy that was long on the quintile of lowest P/E stocks and short on the quintile of highest P/E stocks would have observed an average annual return of 6.75% (gross of tax before commissions and other transaction costs) over the period from April 1957 to March 1971.

Basu (1983) further examined the relationship between P/E ratios, firm size and common stock returns in order to determine which effect is more predominant in explaining cross-section stock returns. The results for the period between January 1963 to December 1979 showed evidence that the portfolios of stocks with low P/E ratios outperformed portfolios of stocks with high P/E ratios; the effect was significant even after controlling for size effects. Although small NYSE firms appeared to earn substantially higher returns than large NYSE firms, the size effect disappeared when returns were controlled for differences in P/E ratios and risks. Higher returns for small firms were accompanied by higher levels of variability which was not the case for low P/E ratios. By partitioning each market value class into five different P/E portfolios, Basu was able to determine whether there existed an interaction between P/E ratios and firm size. The results showed that the P/E effect became weak as one moved from the smallest size class to the largest size class. The T-statistics for the spread between the lowest P/E and highest P/E classes were significant only within the smallest three size quintiles. However, P/E classes partitioned into five different market value portfolios showed that the abnormal returns were not statistically significant signaling that the size effect disappeared when returns were controlled for differences in P/E ratios. The results concluded that while P/E ratios and market values appeared to be interrelated, the effect of firm size appeared to be of secondary importance when compared with the effect of P/E ratios for the 1963-1979 period.

Ball (1978) argued that P/E is a general proxy for risk and returns. Thus, if two stocks have the same current earnings but different risks, the riskier stock has a higher expected return and is likely to have a lower price and consequently lower P/E.

Alternatives to the P/E ratio are the price-to cash flow ratio (P/CF) and price-to-sales ratio (P/Sales). Cash flow is usually defined as reported accounting earnings after tax plus depreciation and sales is defined as net sales or revenues. Reported earnings is usually a noisy variable and prone to distortions driven by goodwill treatment, depreciation, investment income, etc. Cash flow is a transparent estimate of economically important flows accruing to the firm's shareholders. Cash flow and sales cut across different accounting standards and allow cross border comparisons on a like for like basis. Moreover, sales figures for firms are readily available and do not suffer from volatility and negative values making it easy to compute P/Sales ratio. We discuss the key drivers behind these valuation ratios in greater detail in Chapter 5.

Chapter 2 – Literature Review

Lakonishok, Shleifer and Vishny (1994) had conducted a study to investigate the cross-sectional relationship between returns on a universe of NYSE and American Stock Exchange (AMEX) firms and five variables: past performance recorded as past sales growth, book-to-price ratio, earnings yield, cash flow-to-price ratio and size from April 1968 to April 1990. They concluded that past sales growth, book value-to-price ratio, earnings yield and cash flow-to-price ratio on a standalone basis had statistically significant predictive power on returns. Both past sales growth (the prominent role of sales was also noted by Barbee, Mukherji and Raines (1996)) and cash flow-to-price ratio were the variables that stood out the most when a combination of all five variables were used simultaneously in the regressions. In fact, on a standalone basis, cash flow-to-price ratio appeared to be the most significant variable.

Brouwer, Van der Put and Veld (1997) examined the profitability of value strategies on four European countries using book value-to-price ratio, cash flow-to-price ratio (CF/P), earnings yield and dividend yield. They showed that cash flow-to-price ratio appeared to be the most significant variable producing an average annual spread of returns of 20.8% between high CF/P and low CF/P stocks.

Hawawini and Keim (1999) also showed that the cash flow-to-price effect is superior to the earnings yield effect. They reported an average monthly return difference between the highest and lowest cash flow-to-price portfolios of 0.89% and between the two extreme earnings yield portfolios of 0.72%.

Tuomo Vuolteenaho (2002) showed that firm level stock returns are predominantly driven by cash flow news. Cash flow news is typically accompanied by higher expected returns. This correlation appears to be larger for smaller stocks.

Studies by Fama and French (1998) also showed the existence of value premium using P/B, P/E and P/CF in both United Sates and Europe. However, their results showed equal importance for each of the variables in terms of value-growth spreads. Moreover, the size of the spreads based on P/B, P/E and P/CF in the US market are smaller than the spreads documented by Lakonishok, et al (1994). This could be due to the fact that the results of Fama and French might have been influenced by the effects of size. The stocks incorporated within the MSCI Index which forms the sample universe of the Fama and French study is dominated by relatively large market capitalisation stocks compared to the universe of stocks used by Lakonishok, et al.

Barbee, Mukherji and Raines (1996) showed the prominent role of P/Sales in explaining average stock returns. P/Sales ratio absorbed the roles of book-to-price ratio, debt-to-equity ratio, size when a combination of all four variables were used in the regressions in a multivariate context on a universe of NYSE and AMEX firms during the period 1978-1989.

Dividend yield is also regarded as another measure for defining value/growth stocks. Dividends represent the most direct form of cash flow to shareholders. The only disadvantage is that dividend yield as a single measure cannot be used to make comparisons against low yielding or no dividend paying companies unless one uses a long term dividend discount model. The long term dividend discount model used in deriving valuations of firms takes into account of the medium/long term growth potential of firms that ultimately drive the dividend paying capability of firms in the long run.

Using Gordon's Growth Model based on the dividend discount model, the price per share of a stable firm is defined as below:

$$P_0 = \frac{DPS_1}{r - g_n}$$

$$= \frac{DPS_0 \times (1+g_n)}{r - g_n}$$

where;
- P_0 = Price per share (current year)
- DPS_1 = Expected dividends per share next year
- DPS_0 = Dividend per share (current year)
- r = Required rate of return on equity
- g_n = Growth rate in dividends (forever)

$$\Rightarrow {}^{P_0}/_{DPS_0} = {}^{P}/_{D} = \frac{(1 + g_n)}{r - g_n}$$

$$\Rightarrow \text{Dividend yield} = {}^{D}/_{P} = \frac{(r - g_n)}{(1 + g_n)}$$

In simplified terms, high yielding stocks sell below fair value and is considered 'cheap' while low yielding stocks are overpriced.

Rozeff (1984) had conducted a number of tests linking the relationship between dividend yield and average common stock returns. They showed that the average returns of the S&P500 during the period 1926-1982 increased continuously and monotonically as the market dividend yield increased.

Levis (1989, 1995) also found that investment strategies based on dividend yield and P/E appeared to be profitable on the London Stock Exchange during the period from April 1965-March 1985.

Fama and French (1998) also conducted a study on the existence of value premium using dividend yield in the United States and Europe. Their results showed that value premium based on dividend yield was not consistent across markets. The spread in returns between a portfolio of high yield stocks and a portfolio of low yield stocks was not statistically significant in most markets with the exception of France. Differences in market structure, taxations where tax on income is higher than capital gains explain the differences in value premiums based on dividend yield across markets.

John Campbell (1990) showed that stock returns in the US equity markets during the period 1952-1988 were predictable. Dividend yield and relative T-bill rate were the significant drivers.

The variable that has commanded most attention to date is the price-to-book value ratio. There are many academic and empirical studies documenting a negative relationship between stock returns and P/B ratio. P/B ratio has also been universally accepted as the most common proxy in the investment industry for measuring value and growth stocks.

Fama and French (1992) studied the cross-sectional relationship between returns on a universe of NYSE, AMEX and National Association of Securities Dealers Automated Quotation (NASDAQ) firms and five variables: beta, book value-to-price ratio, leverage (asset-to market equity ratio), size and earnings yield during the period 1963-1990. Their results showed that book value-to-price ratio and size captured the cross-sectional variation in stock returns. A combination of book value-to-price ratio and size absorbed the roles of beta, leverage, earnings yield in average stock returns. They also found that the single factor CAPM defined by beta, failed to explain cross-sectional average returns. Their results further documented that on a standalone basis, book value-to-price ratio appeared to be the most significant variable. Further, book value-to-price ratio appeared to play a larger role than size when the two variables are used simultaneously in explaining cross-sectional average returns. The results of Fama and French did not agree with Basu (1983) on the relative importance of P/E. Fama and French showed that both book value-to-price ratio and size absorbed the role of P/E when all three variables were used simultaneously to explain average stock returns. The results of Fama and French clearly conveyed the message that the importance of new variables can be uncovered when a larger set of fundamental variables is considered. Fama and French also tested the consistency of the role of book value -to-price ratio and size across two subperiods : 1963-

1976 and 1977-1990. Like the overall period extending from 1963 to 1990, the subperiods also confirmed that book value-to-price appeared to play a larger role than size when the two variables are used simultaneously in explaining cross-sectional stock returns. The subperiod results thus support the conclusion that book value -to -price is consistently the most powerful for explaining the cross-section of average stock returns.

Capaul, Rowley and Sharpe (1993) also showed the presence of value premium using P/B ratio over the period from January 1981 to June 1992.They showed that value stocks outperformed growth stocks based on P/B ratio in the United States and other European countries (France, Germany, Switzerland and UK) analysed over the sample period both on absolute and risk adjusted returns basis. In fact, the spread in returns between value and growth portfolios for the European countries exceeded that of the US market. The spread in returns between value and growth portfolios in the US sorted by P/B is smaller than that recorded by Fama and French (1992). This could be due the fact that results of Capaul et al might have been influenced by the effects of size as the stocks incorporated within the S&P500 universe are relatively large compared to the universe of data used by Fama and French which included NYSE, AMEX and NASDAQ stocks. Fama and French had measured spreads in returns based on the lowest and highest quintiles at the extremes. However, Capaul et al recorded spreads in returns based on two portfolios sorted on P/B ratio such that the market capitalisations of the two portfolios were equal at the dividing line.

Lakonishok, Shleifer and Vishny (1994) had also shown that P/B ratio has statistically significant predictive power on average stock returns. Their portfolio strategies were based on a universe of NYSE and AMEX firms covering the period from 1968-1990. They showed an average annual spread of returns of 10.5% between low P/B and high P/B stocks. However, as discussed above, Lakonishok et al, found that both past sales growth and cash flow-to-price ratio have stronger predictive powers on average stock returns. In fact, cash flow-to-price ratio appeared to be the most significant variable. They argue that P/B is not the most appropriate proxy for value and growth stocks as it is not uniquely associated with the underlying economic characteristics of the firms compared to past sales growth and cash flows. For example, a high P/B may describe a firm with many intangible assets such as research and development or a firm with growth opportunities that does not enter the computation of book value but in the market price at which the stock trades. A high P/B may also reflect a firm such as a natural resource company with good growth opportunities but with high temporary profits after a cyclical increase in the underlying commodity prices.

Similar studies conducted by Miles and Timmermann (1996) in the UK market over the period 1977-1989, showed that book value-to-price ratio and size captured the cross-sectional variation in stock returns. They further showed that a combination of book value-to-price ratio, dividend yield and size absorbed the roles of debt gearing and earnings yield in average stock returns. Moreover, their results also highlighted that after controlling for beta; book value-to-price ratio, dividend yield and size remained significant.

Strong and Xu (1997) also applied the Fama and French methodology to UK data, in order to examine whether beta, book value-to-price ratio, leverage, size and earnings yield explain the cross-section of stock returns over the period 1955-1992. Their results showed that book value-to-price ratio and leverage were the only variables consistently significant in explaining the cross-sectional variation in stock returns of the UK market.

Bauman, Conover and Miller (1998) also showed the presence of value premium using P/B ratio in a majority of countries in the developed European markets over the period from 1985-1996.

Fama and French (1998) also showed the existence of value premium using price-to-book value (P/B) ratio in the United States and Europe during the period 1974-1994. However, the spread in returns between value and growth portfolios in the USA sorted by P/B is smaller compared to the results of their studies in 1992. The difference in spreads could be attributed to the fact that the results of Fama and French (1998) might have been influenced by the effects of size as the stocks incorporated within the MSCI database which was the universe used for 1998 studies are relatively large compared to the NYSE, AMEX and NASDAQ stocks in the universe of data used in their 1992 studies obtained from Compustat database. Further, the data prior to 1978 used in the 1992 studies might have contained the effects of look-ahead bias that could have had an impact on the results. This bias is due to Compustat's major expansion of its database in 1978. Typically, for smaller market capitalisation stocks, only those with good five years past performance track record were added into the database. This could potentially explain the association between small size and high returns observed in the Fama and French results in 1992 which is driven by the first five years that the firm appeared on the Compustat database.

Dongcheal Kim (1997) showed that the role of P/B remained significant in explaining returns of the US market during 1958-1993 even after correcting the Compustat bias identified in Fama and French's (1992) results. Chen and Zhang (1998) also showed the presence of value premium using price-to-book value (P/B) ratio in the United States during the period 1970-1993. Studies by Arshanapalli, Coggin and Dukas (1998) also showed the superiority of value strategies based on P/B ratio in the United States and Europe.

Finally, Chan and Lakonishok (2004) extended the study on value/growth strategies using more comprehensive indicators to define value and growth stocks. Their study was based on the use of multi-factor composite valuation criteria. The factors used in the multi-factor composite valuation indicator included P/B, P/E, P/CF and P/Sales. Coefficient estimates generated from the cross-sectional regressions on stock returns against independent variables such as P/B, P/E, P/CF and P/Sales were used as weights in the composite valuation indicator. They examined the spreads in returns between value and growth stocks for both the small-cap and large-cap universe. The results showed that composite valuation criteria boosted the performance of value stocks in both the small-cap and large-cap samples. Further, they showed that the spread in returns between value and growth stocks in the small-cap sample was 8.4% higher than the spread in returns for the large-cap sample during the period 1979-2001. Value stocks outperformed growth stocks more than 70% of the months during the sample period for both the small-cap and large-cap stocks. It was during the technology bubble era of 1998-1999 that the value stocks in both the small-cap and large-cap samples underperformed the growth stocks. The TMT euphoria saw many large-cap growth stocks chased to unrealistic valuation levels. However, as the operating performance of these companies could not keep up with investors' expectations reflected in the rich valuations accorded to these stocks; we observed the collapse in their share prices. This led to the bursting of the TMT bubble and the return of value supremacy. Thus, the average spread in returns favoured value stocks for the entire decade of the 90s. The average spread in returns for large-cap stocks was 12% and 19% for the small-cap stocks; despite the short episode of TMT bubble during the late 90s.

2.3 Value/Growth Effect: Empirical Evidence in Asian Equity Markets

Despite the considerable empirical research predominantly in the United States and a fair amount in Europe, relatively little research has been published regarding the relationships between stock returns in the Asian markets and fundamental variables. There are reasons to believe that value and growth stocks may perform differently outside the equity markets of the developed western countries or the same fundamentals/risk driving the common stock returns in the United States and Europe may no longer do so in Asia due to differences in institutional and behavioural factors.

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Bekaert et al (1996,1997) and Campbell Harvey (1995) showed evidence that mispricing occurs in emerging Asian markets and that emerging market returns are more predictable than developed markets of US and Europe. Bekaert and Harvey (1995) and Campbell Harvey (1995) argued that these emerging markets are not fully integrated into the world markets. As a result, commonly used risk measures implied by asset pricing theory that work reasonably well in capturing cross-section average stock returns in world markets fail to explain the predictability in returns of emerging markets. Emerging markets including many markets in Asia are not fully integrated into the world markets and are therefore influenced by local factors.

Local factors highlighted by Harvey (1995) and Bekaert et al (1995, 2003) such as taxes, investment restrictions, timeliness of trading information, acute information asymmetries, foreign exchange regulations, the availability and accuracy of accounting information, market liquidity, political risk, demographics and institutional structures that protect investors all contribute to varying levels of integration to the developed markets. Bekaert and Harvey (2000,2003) documented a clustering of liberalisations in the late 1980s and 1990s. Asian governments pursued policies of gradual capital market liberalisations during the 1990s which allowed foreign investors to participate directly in local markets. Liberalisation induces markets to integrate with the developed world economies. This is typically associated with significant new foreign capital flows into the equity markets. Further research showed that the capital flows increase on an annual basis for up to three years and then are subsequently reduced consistent with the price pressure hypothesis (refer Section 2.5.2.3.3). Their findings showed that the liberalisation process led to small increases in correlation with the world markets and a small decrease in dividend yields reflecting a decrease in cost of equity capital. This decrease in cost of capital resulted in an increase in capital investment and hence an increase in gdp growth. Bekaert, Harvey and Lumsdaine (2002) linked the decrease in cost of capital with increase in foreign flows which captured cross-section of expected returns. They concluded that as these markets evolve and mature with time, the varying levels of integration to the developed world markets that vary across time explain both the persistence of mispricing and differences in expected returns across markets and time.

The studies highlighted below prove that mispricing occurs in Asian markets. Moreover, there exist differences in terms of size of spreads and the importance of variables driving the common stock returns in Asia.

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Chan, Hamao and Lakonishok (1991) conducted a study to explore the cross-sectional relationship between returns on Japanese stocks and four fundamental variables: earnings yield, size, book value-to-price ratio and cash flow-to-price ratio during the period from January 1971 to December 1988. Their results showed that book value-to-price ratio and cash flow-to-price ratio captured the cross-sectional variation in stock returns.
A combination of book value-to-price ratio and cash flow-to-price ratio absorbed the roles of size and earnings yield in average stock returns. In fact, when all four variables were used simultaneously, the weakest variable appeared to be earnings yield. The reason both book value-to-price ratio and cash flow-to-price ratio have higher predictive powers could be due to the distortions in reported earnings for Japanese firms. The practice of large capital expenditure programmes among Japanese firms results in 'accelerated depreciation' allowances that reduce tax burden. This causes distortions in tax charges on reported income and hence on reported earnings after tax. Reported income therefore is a 'noisy' variable and not a good indicator of profitability of Japanese firms.

Capaul, Rowley and Sharpe (1993) also showed the presence of value premium using P/B ratio over the period from January 1981 to June 1992 in Japan alongside with other major developed western markets. In fact, the spread in returns between value and growth portfolios for Japan was particularly one of the highest and exceeded that of the US market. However, the spread in returns between value and growth portfolios in Japan sorted by P/B is smaller than that recorded by Chan et al (1991). The differences in results could be due to different test sample time periods and database used. Moreover, the results of Capaul et al might have been influenced by the effects of size as the stocks incorporated within the MSCI database which was the universe used are relatively large compared to the data universe used by Chan et al; that included firms from both sections of the Tokyo Stock Exchange; i.e. large and small capitalisation stocks. Further, Chan et al had measured spreads in returns based on the lowest and highest quintiles at the extremes while Capaul et al had recorded spreads in returns based on two portfolios sorted on P/B ratio such that their market capitalisations of the two portfolios were equal at the dividing line.

Jacques and Rie (1994) had conducted a study which examined the relative importance of company fundamental data to stock price formation within the security markets in Japan. They used cross-sectional regressions to determine the relationships between prices and underlying company fundamentals. Their results were consistent with the empirical findings on the relationship between stock price returns and fundamental ratios. As for Japan, it was noted that current earnings, size and current book value were relatively important. This was consistent with the results on the univariate tests conducted in Japan by Chan et al (1991). Chan et al had shown that on a standalone basis, P/B, P/E and size have significant influence on future stock returns in the Japanese equity markets. Studies conducted by Fama and French (1998) had also shown significant influence by both P/B and P/E on Japanese common stock returns.

Jun Chai (1997) had conducted similar studies as Lakonishok et al (1994) to investigate the cross-sectional relationship between returns on the Japanese equity market and five variables: past performance recorded as past sales growth, book value-to-price ratio, earnings yield, cash flow-to-price ratio and size from January 1971 to December 1993. He showed that past sales growth, book value-to-price ratio, cash flow-to-price ratio and size on a standalone basis had statistically significant predictive power on returns. The evidence is consistent with the view that earnings yield is not a statistically significant explanatory variable on Japanese stock returns as observed by Chan et al (1991). Both book value-to-price ratio and size were variables that stood out the most when a combination of variables were used simultaneously in the regressions in a multivariate context. However, Chan et al (1991) had observed that both book value-to-price ratio and cash flow-to-price ratio were the most significant variables capturing the cross-sectional variation in Japanese stock returns. The universe of data used by Chan et al had included delisted companies as well as companies in the non-manufacturing sector accounting for more than 30% of Japanese equity market in terms of market capitalisation. On the other hand, the sample universe used by Jun Chai focused only on the manufacturing sector ignoring non-manufacturing companies and delisted companies. This provides a plausible explanation for the reason behind the significantly stronger predictive power of cash flow-to-price ratio compared to size factor as observed by Chan et al. Size factor appeared significant in Jun Chai's results but the results may be influenced by survivorship bias and distorted by the fact that the sample universe used does not have a complete representation of the Japanese equity market.

Fama and French (1998) also showed the existence of value premium in the Asian markets constituting the MSCI EAFE and IFC indices over the period from December 1974 to 1994. Price-to-book value (P/B) ratio and price-to-cash (P/CF) flow ratio each independently had influence on future returns of the developed Asian security markets comprising of Japan, Hong Kong and Singapore. Their value premiums were generally higher than the other developed markets in the US and Europe sorted independently on P/B and P/CF. Value premiums based on price-to-earnings (P/E) ratio and dividend yield were less consistent across the countries. Apart from exchange rate effects, this could be attributed to differences in market structure and behaviour of investors who tend to place more emphasis on capital gains than income. For example, the Hong Kong MSCI Index is dominated by a few large, high P/E and low dividend yield companies with a large number of smaller high dividend yield and lower P/E companies thus reducing the explanatory power of both dividend yield and P/E ratio. They did not conduct tests based on size for the developed Asian markets as the MSCI database contains relatively large stocks. As for the smaller Asian markets of Korea, Malaysia, Philippines and Taiwan, there was consistent value premium for portfolios based on P/B ratio. In fact, their value premiums were generally higher than the other developed markets in Asia, US and Europe. They also showed no consistency in the results based on P/E ratio and size for the smaller Asian markets.

Bauman, Conover and Miller (1998) also extended their analysis to include the developed Asian markets constituting the MSCI EAFE Index over the period from 1985-1996. Similar to their analysis on the European equity markets, they showed that value strategies outperformed growth strategies based on P/B ratio in a majority of the Asian countries across the sample period. The value premiums based on P/B in the Asian markets were generally higher than the value premiums recorded in the other developed markets in the US and Europe.

Chen and Zhang (1998) examined the performance of value strategies in Japan, Hong Kong, Malaysia, Taiwan, Thailand and United States from 1970 to 1993. However, they found that value premium based on P/B ratio is persistent only for the United States but less persistent for Japan, Hong Kong and Malaysia and almost non-existent for markets like Taiwan and Thailand. The results contradict the results of studies in Asia conducted by Fama and French (1998) and Bauman et al (1998) possibly due to different test sample time periods and database used.

Finally, Chan, Karceski and Lakonishok (1998) showed that common movements in stock returns in the Japanese market over the period 1976-1994, were associated with size, dividend yield and P/B ratio. This confirmed the results of univariate studies conducted in Japan relating fundamental ratios to future stock returns.

2.4 Interaction Between Value and Size Effects

The relationship between returns and market value of common equity has received a lot of attention in the finance literature. Banz (1981) and Reinganum (1981) were the first to document the existence of small capitalisation anomaly in the US equity market.

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Following the discovery of size premium in the US equity market, numerous studies have documented its existence in other international markets. Levis (1985), Dimson and Marsh (1987) and Corhay, Hawawini and Michel (1988) observed the size effect in the UK equity market. Size premium was also observed in Australia, Canada, Japan and several European markets by Hawawini and Keim (1995, 2000). Chan, Hamao and Lakonishok (1991) also observed the existence of size effect in Japan.

Within a couple of years of studies being completed on size premium and the adoption of small capitalisation companies as a distinct asset class, most equity markets observed a reversal in the small capitalisation premium during period 1989-1999. A number of studies by Dimson et al (1999), Levis (1999) and Levis and Steliaros (1999) documented the reversal in performance of small capitalisation companies versus large capitalisation companies.

The most promising explanation behind the reversal in small capitalisation premium was documented by Dimson et al (1999). They attributed the reversal in premium to relative underlying corporate performance which is reflected in relative dividend related performance of companies. This is explained more in detail with Dimson and Marsh (2001) analysis on the consistency of the size effect in the UK market over the 1955-1999 period and across subperiods as well. They showed that over the entire 1955-1999 period, performance favoured small caps but the story differs when performance was analysed over subperiods. Smaller companies outperformed the UK market during 1955-1986. During 1987-1988, there was considerable interest in the asset class with at least 30 open and closed-end funds. After 1987-1988, the UK size premium went into a sharp reverse. The geometric mean premium switched from +9.7% over 1955-1988 to -6.8% over 1989-1999. Dimson and Marsh linked relative stock price performance with relative corporate performance measured in terms of dividend related performance. They showed that in 1955, the prospective dividend yield for the UK microcap index was 4.6% higher than the large caps and the dividends grew at an annualised rate that was 4.5% greater than the large caps. However, with the large interest shown in the asset class, the higher price to dividend multiple in 1988 left microcaps yielding 1.6% less than the large caps as a result of the market rerating the microcaps based on expectations of higher dividend growth. Unfortunately, the following decade witnessed microcap dividends growing at 2% less than large caps. The fall in the price-to-dividend multiple of 4.2 per year together with the relative growth in dividends at -2% largely explain the -6.8% microcap premium over this period.

Size and valuation ratios which are used as proxies for value and growth have share price as a common factor. Therefore, it is not unreasonable to infer that there is an interaction between the two anomalies. Many studies have attempted to analyse numerous variables in order to find which effect – value/growth or size, is more predominant in explaining the cross-section of stock returns.

Reinganum (1981) argued the superiority of size-base effect. After controlling returns for any P/E effect, a strong size-based effect emerged. But P/E effect disappeared after controlling returns for any market value effect.

On the other hand, Basu (1983) concluded that while P/E ratios and market values appeared to be interrelated, the effect of firm size appeared to be of secondary importance when compared with the effect of P/E ratios in the US market for the period during 1963-1979. Basu argued that Reinganum's defective risk adjustment of returns concealed the P/E effect that was indeed present in Reinganum's data.

Barbee, Mukherji and Raines (1996) also showed the prominent role of P/Sales compared to size when they conducted studies in the US market during the period 1978-1989.

Fama and French (1992) showed that while P/B ratio and size captured the cross-sectional variation in stock returns in the US market during 1963-1990, P/B ratio appeared to play a larger role than size when the two variables are used simultaneously in explaining cross-sectional average returns.

Levis (1989) and Strong and Xu (1997) found that size is subsumed by valuation ratios such as P/B and P/E in the UK market.

Finally, Dimson, Marsh and Staunton (2004) examined both size and value effects since they were first noted by academics over a longer time history. Their results showed strong evidence that the value-growth premium has persisted over the long run during the period 1900-2003 in the UK market while the size effect did not persist particularly during the 90s.

2.5 Value/Growth Effect: Explanations

Although research has shown superior performance generated by value strategies, the interpretation as to the variation of returns related to value and growth strategies has been controversial.

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Three markedly different explanations have been provided for the value/growth effect. According to the first, superior return of value strategies represents compensation of risk, consistent with rational, efficient pricing in equity markets. Another school of thought relies on behavioural finance paradigm and some form of market inefficiency to explain this phenomenon. Systematic errors in the way that both investors and analysts form expectations about future growth opportunities have been proposed as an explanation behind the value/growth effect. Extreme expectations about future growth prospects of stocks may range from investors and analysts naively extrapolating past earnings/sales growth too far into the future, to reliance on analysts' earnings forecasts which are systematically biased, to assuming a trend in stock prices, to over-reacting to good or bad news, to portfolio flows, to various cognitive and research biases or to simply equating a good investment with a well run company irrespective of its price. Expectational errors cause a certain degree of mispricing which makes value stocks underpriced and growth stocks overpriced. The others attribute the superior performance of value strategies to research biases such as survivorship bias and data snooping.

We examine the different explanations behind the value/growth effect in greater detail below.

2.5.1 Risk Based Explanations (Market Efficiency)

Fama and French (1995, 1996) claimed that value stocks are distressed firms associated with sustained low profitability and the value premium is compensation for risk missed by CAPM. Their conclusion is based on the fact that there is common variation in earnings of distressed companies not explained by the market return, thereby suggesting that price-to-book value ratio (P/B) and size are proxies for unobservable common risk factors (missed by CAPM) consistent with rational pricing theory.

Studies by Fama and French (1992, 1993) led to the development of a three-factor asset pricing model which explains anomalies missed by CAPM. They used time-series regression to regress monthly stock returns against the returns of a market portfolio and returns of portfolios constructed to mimic the risk factors in returns related to size and book-to-market equity risk factors. The regressions showed that there are risk factors in stock returns related to size and book-to-market equity. But it requires three factors to explain the cross-section of average excess returns of stocks. According to their three factor model, the expected excess return on portfolio i is as shown below:

$$E(R_i) - R_f = b_i[\, E(R_M) - R_f \,] + s_i E(SMB) + h_i E(HML)$$

where;

$E(R_M)$ - R_f = the excess returns on a broad market portfolio,

SMB = the difference between the return of a portfolio of small stocks and the return of a portfolio of large stocks,

HML = the difference between the return of a portfolio of high book-to-market equity stocks and the return of a portfolio of low book-to-market equity stocks.

$E(R_M)$ - R_f, E(SMB), E(HML) are the expected premiums while the factor sensitivities b_i, s_i and h_i are the slopes in the time series regression:

$$R_i - R_f = \alpha_i + b_i(R_M - R_f) + s_i SMB + h_i HML + \Sigma_i$$

Fama and French (1996) showed that the three-factor model captured the returns of portfolios formed on price-to-earnings ratio, price-to-cash flow ratio and sales growth. Value stocks (stocks with high earnings yield, low price-to cash flow ratio and low sales growth) tend to load positively on HML and thus have higher returns. Generally, the model captures much of the variation in the cross-section of average stock returns and absorbs most of the anomalies unexplained by CAPM. They claimed that the empirical success of the three-factor model suggests that is an equilibrium pricing model. This provides evidence that P/B ratio (HML) and size (SMB) are proxies for common risk factors in returns consistent with rational pricing theory. Ralitsa Petkova (2002) further showed that HML proxies for a term spread surprise factor in returns while SMB proxies for a default spread surprise factor.

Mark Cahart (1997) further revised Fama and French's three-factor model to include an additional factor capturing Jegadeesh and Titman's (1993) one year return momentum anomaly. This resulted in a four-factor model where the expected excess return on portfolio i is as shown below:

$$E(R_i) - R_f = b_i[E(R_M) - R_f] + s_i E(SMB) + h_i E(HML) + p_i E(PRY1YR)$$

where;

E(PRY1YR) = the difference between the return of a portfolio of stocks sorted on 1 year return momentum (winners based on last 1 year return) and the return of a portfolio of stocks based on contrarian strategy (losers based on last 1 year return)

Cahart's model captured much of the variation in the cross-section of average returns and absorbs most of the anomalies unexplained by CAPM and Fama and French's three-factor model. He claimed that whilst the three-factor model improves on the average pricing errors from the CAPM, the four factor model noticeably reduces the average pricing errors relative to both the CAPM and Fama and French's three-factor model. For comparative purpose, the mean absolute errors from the CAPM, three-factor and four-factor models are 0.35%, 0.31% and 0.14% respectively per month. He further showed that transaction costs related to portfolio turnover captured most of the performance unexplained by his four-factor model. Cahart thus concluded that the four-factor model is consistent with a model of market equilibrium with four risk factors. Cahart's evidence is consistent with rational efficient pricing in equity markets where P/B ratio, size and momentum are proxies for common risk factors in returns.

Moreover Campbell and Shiller (1988) and Campbell (1991) showed that unexpected returns can be written as an approximate linear function of changing expectations of future cashflows, real interest rates and excess returns. Since betas are scaled covariances of returns with sources of risk using the Campbell -Shiller decomposition, Campbell and Mei (1993) derived that betas depend on the covariances of news about cashflows, real interest rates and future excess returns with sources of risk consistent with market efficiency.

Ferson and Korajczyk (1995) showed that in an efficient rational pricing model, any predictability of returns should be driven by changes in the betas and changes in the expected risk premiums. They made use of a five-factor model based on economic factors similar to Chen, Roll and Ross (1986) comprising return of the S&P500 stock index, interest rate factor, unexpected inflation factor, default risk factor and term structure risk factor. They find that the five-factor model captured about 80% of the predictability of returns observed by their sample of industry-grouped stock portfolios consistent with efficient pricing theory.

On the other hand, Lakonishok, Shleifer and Vishny (1994) argued that risk does not explain the differences in returns between value and growth strategies. They argued that if value strategy is fundamentally riskier, then it should underperform relative to growth strategy during undesirable states of the world when the marginal utility of wealth is high. Down-market months of the stock market or the economy generally correspond to periods when aggregate wealth is low and thus the utility of an extra dollar is high. They examined the performance of value and growth strategies based on P/CF and past growth in sales during down-market periods of both the stock market and the US economy. The results showed that when the stock market performance was negative, value stocks outperformed and the outperformance was more pronounced during the worst twenty-five months.
The results were similar when economic performance based on quarterly growth in real GNP was used. Their evidence did not support the view that the superior returns on value stocks reflect their higher fundamental risk contradicting the views of Fama and French.

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The studies by Daniel and Titman (1997) were not able to suggest that the high returns of value and small-cap portfolios are as a result of compensation for factor risk; contradicting the conclusions by Fama and French. They conducted studies to determine whether the high returns of low P/B and small size stocks can be attributed to their risk factors. They instead found that low P/B value stocks were not associated with distress but reflected the fact that low P/B value firms tend to have similar characteristics. They may be in related lines of businesses, similar industries or similar geographic regions. They then tested whether portfolios with similar characteristics but different loadings on the Fama and French risk factors had different returns. After controlling for firm characteristics, expected returns did not appear to be positively related to the risk factor loadings on market, size (SMB) and book-to-market equity (HML) factors. Contrary to Fama and French, their analysis suggests that firm characteristics and not risk factor loadings that determine expected returns. However, Davis, Fama and French (2000) showed that the evidence of Daniel et al in favour of the characteristics model is restricted to their short sample period covering 1973 to 1993. When Davis et al conducted the same analysis over a longer sample period from 1929 to 1997, they found that Fama and French's three-factor asset pricing model explained the value premium better than the firm characteristics model of Daniel et al. The results were also similar for the rest of the 68 year period when they omitted the 1973-1993 period used by Daniel et al. The results thus confirmed that the characteristics model proposed by Daniel et al is special to their rather short sample period. However, they further showed that the three factor model failed to explain the value premium better than portfolios sorted independently on P/B or size. This showed that the three-factor model is just a model and thus an incomplete description of expected stock returns.

Brouwer, Van der Put and Veld (1997) were also not able to show evidence that the value premium in four European countries is driven by the risk-return trade-off proposed by Fama and French. Their value strategies based on book value-to-price ratio, cash flow-to-price ratio, earnings yield and dividend yield outperformed growth strategies consistently over the sample period 1982-1993; even during bad economic periods. Although value portfolios had on average a higher standard deviation of returns in relation to growth portfolios, they found that the large differences in returns between value and growth portfolios could not be fully explained by these risk differences.

Xavier Garza-Gomez (2001) also showed that the relationship between book value-to-market equity and risk is weak for the Japanese equity market. Their results showed that as book value-to-market equity ratio increases, the fraction of losing companies decreases. Moreover, he found that the profitability of low and high book value-to-market equity portfolios similar. Hence he was not able to support the distressed company explanation proposed by Fama and French. Instead he found that past performance seemed to explain the book value-to-market equity effect consistent with the extrapolation hypothesis discussed below.

On the other hand, the conclusions by Chen and Zhang (1998) confirmed the results of Fama and French that value strategies produce superior returns because they are riskier. Chen and Zhang examined three risk proxies: leverage (measured by the ratio of book debt-to- market equity), earnings uncertainty (measured by the standard deviation of earnings for fiscal year t over price at the December year end t-1) and distress factor (measured by the percentage of firms that cut their dividends by 25% or more in the portfolio). Their results showed that the three risk proxies were able to capture the pricing information contained in size and book value-to-market equity for portfolios sorted on size and book-to-market equity. They concluded that value stocks tend to be firms under distress with high financial leverage and face uncertainty in future earnings. Hence the market responds by persistently pricing them cheap compared to the growth stocks which are persistently priced by the market at a premium to book.

2.5.2 Behavioural Explanations (Market Inefficiency)

Not all studies agree with the risk-based argument as the sole explanation behind the superior performance of value strategies.A number of studies provide empirical evidence that relies on behavioural finance paradigm and some form of market inefficiency to provide alternative explanations behind the value/growth effect. Systematic errors in the way that both investors and analysts form expectations about future growth opportunities have been proposed as an explanation behind the value/growth effect. Expectational errors cause a certain degree of mis-pricing which makes value stocks underpriced and growth stocks overpriced. The correction of mis-pricing growth opportunities explains the superior performance of value strategies.

There may be many different sources of extreme expectations. Overreaction may range from investors and analysts naively extrapolating past earnings/sales growth too far into the future, to reliance on analysts' earnings forecasts which are systematically biased, to portfolio flows, to various cognitive errors or to research biases. Although a number of studies support the expectational error hypothesis, there has not been a common consensus on the sources of extreme expectations that cause overreaction among investors and analysts. We provide a detailed review of the studies that support these explanations below:

2.5.2.1 Extrapolation

Extrapolation is a special case of overreaction, which implies that the future is expected to be similar to the past. Lakonishok, Shleifer and Vishny (1994) argued that value (growth) stocks are characterised by low (high) past growth and expected low (high) future growth in sales, earnings and cash flows. These characteristics create excessive optimism for growth stocks and pessimism for value stocks which is subsequently reflected in the stock prices. This causes certain degree of mispricing which makes value stocks to be underpriced and growth stocks overpriced. According to Lakonishok et al, the mean reversion of the growth characteristics explains the difference in performance between value and growth stocks where past 'losers' outperform past 'winners'.

Lakonishok et al, also tested the overreaction hypothesis by analysing the actual future growth rates and comparing them to past growth rates and expected growth rates as implied by the valuation multiples accorded by the market. The results showed that growth stocks had historically grown faster in sales, earnings and cash flow relative to value stocks during the five years before portfolio formation. The large differences in the valuation ratios between the value and growth portfolios of stocks showed that the market expected the superior patterns of growth stocks to continue into the foreseeable future. However, over the five post-portfolio formation years, the actual growth rates of value firms were generally higher relative to the actual growth rates of the growth stocks. Their evidence showed that value strategies (based on P/E ratio, P/B ratio and 5 year average growth rate of sales) have worked well relative to growth strategies because the actual future growth rates of sales/earnings/cash flows of growth stocks relative to value stocks turned out much lower than they were in the past or as the expected growth rates by the market implied by their valuation multiples. Their results also showed that the market appeared to have consistently overestimated the future growth rates of growth stocks relative to value stocks. The market's expectations were tied to past growth rates which were too optimistic for growth stocks relative to value stocks and the deterioration of the relative growth rates of growth stocks against value stocks post-portfolio formation confirmed the prediction of the extrapolation theory. Their analysis is in accordance with Fama and French's (2000) analysis. They showed that consistent with economic theory in a competitive environment, profitability is mean-reverting within as well as across industries.

Studies by Debondt and Thaler (1985, 1987) have attributed the winner-loser effect based on historical price performance as the cause for overreaction due to errors in expectations. Their results showed that portfolios of prior 'losers' outperformed portfolios of prior 'winners' thirty-six months after portfolio formation. They constructed the portfolios of prior 'losers' based on the bottom 35 stocks ranked on prior 36 months performance before portfolio formation whilst the portfolios of prior 'winners' were based on the top 35 stocks. Their results contradicted Fama and French as they showed evidence that the betas of the portfolios of 'winners' were significantly higher than the betas of the portfolios of 'losers' indicating that the portfolios of 'losers' were not fundamentally riskier. Basci, Basci and Muradoglu (2001) also confirmed in their analysis based on 16 emerging markets and 5 developed markets that the reactionary rise in stock prices following extreme short term falls is a universal phenomenon in developed as well as emerging markets. A trading strategy based on investing after an extreme fall provides above average returns compared to a buy/hold strategy in all of the emerging markets.

Both Debondt et al and Lakonishok et al concluded that the mean reversion of the past performance explains the difference in performance between value and growth stocks where past 'losers' outperform past 'winners'.

Chan, Karceski and Lakonishok (2003) also agreed that investors and analysts overlook the lack of persistence in growth rates and project past growth into the future which makes value stocks to be underpriced and growth stocks overpriced. According to them, the common presumption is that P/B ratio is a measure of a company's future growth opportunities relative to its accounting value. Hence, high P/B suggests that investors expect high future growth prospects compared with the value of assets in place.
The authors then tested whether P/B predicts future growth by ranking stocks into ten deciles by growth in net income before extraordinary items over a five-year horizon. Within each decile, the authors found the median P/B ratio at the beginning of the five-year period and also at the end. This procedure was repeated at the beginning of each year from 1951 to 1998. The results showed a weak relationship between P/B ratio and future growth. The top decile of companies ranked by growth in net income had a P/B ratio at the beginning of the five-year period which was lower than the average P/B ratio for all stocks in the universe. But they found that the ex-post P/B tracked growth closely. After the period of high growth, the top decile of companies traded at a P/B ratio which was the

highest across the deciles showing that investors are quick to jump on the bandwagon and chase stocks with high past growth.. Conversely, investors punished the companies with the lowest realised growth. Their studies provided evidence of the existence of extrapolative biases in the pricing of value and growth stocks. However, La Porta (1996), Dechow and Sloan (1997) and Levis and Liodakis (2001) found no systematic evidence that the value/growth effect arise from extrapolation of past growth.

La Porta (1996) tested the extrapolation hypothesis using a portfolio approach methodology. He used a two-way classification system to define 'winners' and 'losers' within value and growth portfolios based on analysts' expected earnings growth and five-year pre-formation sales growth. According to La Porta, if the extrapolation hypothesis is valid, then the returns of growth stocks that exhibit high past growth will be lower than the returns of stocks that are expected to perform well in the future but with poor past performance (temporary 'losers'). Similarly, the returns of value stocks with high expected growth but low past growth should outperform stocks that are expected to perform poorly in the future but performed well in the past (temporary 'winners'). Consistent with the extrapolation hypothesis, La Porta showed that the returns of growth stocks that exhibit high past sales growth (temporary 'winners') were more negative than those of temporary 'losers'. However, the returns earned by the value stocks with low past sales growth (temporary 'losers') were lower than that of the temporary 'winners' suggesting that extrapolation is not the sole explanation behind the superior performance of value strategies.

Similar studies conducted by Levis and Liodakis (2001) showed that the difference on the post-portfolio formation returns between 'winners' and 'losers' in any of the value and growth portfolio was not sufficient to explain the value premium over the subsequent years. They concluded that the market does not incorrectly extrapolate the past and the stock prices do not reflect the naive extrapolation of past earnings growth or returns.

Dechow and Sloan (1997) showed that the spread in returns between extreme value and growth portfolios sorted on past earnings/sales growth was smaller than that based on P/B ratios indicating that extrapolation of past growth did not appear to provide a complete explanation for the superior performance of value strategies.

2.5.2.2 Analysts' Forecasts

Overreaction to growth expectations of value and growth stocks may be derived from reliance on analysts' forecasts which are systematically biased.

We divide the literature into two parts: i) systematic biases in analysts' forecasts and ii) analysts' forecast errors as an explanation behind the value/growth effect.

2.5.2.2.1 Systematic Biases in Analysts' Forecasts

A number of plausible explanations have been cited for analysts making systematic errors in their forecasts. Dreman and Berry (1995) and Clement and Tse (2005) suggested that analysts may be drawn to the consensus opinion either openly or unknowingly by the safety of the group. An estimate far off the consensus might pose career dangers whereas an estimate near the group may provide the analyst with a much higher degree of safety regardless of how inaccurate it may prove to be. However, this was contradicted by Dimson and Marsh (1984) where they found no evidence to support consensus behaviour of analysts. Their examination of all simultaneous or near simultaneous forecasts by different brokers for the same stock, showed mean correlation with one another of only 0.08.

Lakonishok, Shleifer and Vishny (1992) and Bauman and Miller (1997) similarly suggested that analysts might be aware of the expected returns associated with value stocks but prefer growth stocks because they are easier to justify to their clients.
It is easier to for analysts to present an enthusiastic case for the purchase of a stock of a company that has been a good performer than one with poor recent performance. Muradoglu (2001) claimed that forecasts are adaptive and analysts may use a number of variables as the anchor to back their forecasts upon. Different decision processes may be at work at different occasions. The anchors may range from the last observation, long term average to past trends.Womack (1996) suggested that if an analyst issued unfavourable estimates for a stock; top management and investment contacts may limit or cut off the flow of information to the analyst. Further, negative growth estimates leading to sell recommendations for a stock could harm a brokerage firm's present and potential banking relationships and thus discourage the firm's investment bankers from making such recommendations.

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The studies by Dreman and Berry (1995) provided evidence that analysts consistently make systematic errors in their forecasts of earnings growth. Dreman and Berry defined earnings surprises using four metrics: earnings surprise as a percentage over actual earnings per share (EPS), earnings surprise as a percentage over forecast EPS, earnings surprise as a percentage over absolute difference between forecast and actual EPS and earnings surprise as a percentage over standard deviation of the actual EPS. Their results showed that the mean surprise was negative irrespective of the choice of surprise measure. Negative surprises outnumbered positive surprises and the mean of negative surprises was larger in absolute magnitude than that of positive surprises. The results indicated that analysts tend to be optimistic in making earnings forecasts consistent with expectational error hypothesis. Similarly Fisher and Statman (2000) showed that there was a negative and statistically significant relationship between the sentiment of Wall Street strategists/analysts and stock market returns indicating that analysts tend to be optimistic in their forecasts.

Hiromichi Tamura (2002) showed the existence of significant positive serial correlation in forecast errors in both the consensus forecasts and individual analysts' forecasts. By analysing forecasts made by individual analysts, he also found that there is positive serial correlation in analysts' relative optimism (measured as average distance of an analyst's average forecasts from consensus estimate which explains whether an analyst is optimistic or pessimistic relative to the consensus). He also observed herding in the direction of consensus forecasts. According to Hiromichi, analysts systematically underreact to negative information but overreact to positive information.

Ang and Ma (2001) similarly found that not only analysts failed to anticipate weakness in firms before stock markets crashed but failed to adjust their forecasts after these markets crashed. This observation was made when they investigated the behaviour of analysts around the period of stock market crashes in Indonesia, Korea, Malaysia and Thailand.

Muradoglu (2001) explored the forecasts of experts in the investment field. She showed that experts extrapolate past trends, both bullish and bearish for short-forecast horizons. For the long run, they predict reversals in bear markets while expect continuation of bullish trends. For both short-term and long-term forecasts, their bull market skewness coefficients were positive and larger than that in bear markets. She also showed that accuracy of forecasts change with forecast horizon. She discussed that forecasts are adaptive and may be driven by a number of variables as the anchor to base their forecasts upon. Different decision processes may be at work at different occasions. The anchors may range from the last actual observation, long term mean or past trends. Subsequent research by Muradoglu, Salih and Mercan (2001) showed that in a portfolio context, subjective forecasts of either form (point, interval or probabilistic) did perform better than the standard approach that utilises past trend. The research did not discuss the biases inherent in subjective forecasts.

Kim and Pantzalis (2003) examined herding behaviour among analysts. Their results showed that industrial and geographical diversified companies are associated with more herding than average. According to them, herding is a manifestation of analysts' inability to effectively monitor agency problems and disseminate information to the market.

Beckers, Steliaros and Thomson (2004) analysed whether country and sector effects explain analysts' forecast errors and biases. They used a multiple regression framework for a universe of European stocks during the period 1993-2002. Their results showed that in the past geographical differences existed in earnings forecast accuracy but these broad geographical differences have now broadly disappeared and earnings forecast error no longer reflects any significant country effects. However, they showed that forecast errors are influenced by sector effects. Forecast errors and bias were consistently the lowest in the healthcare and utilities sectors in the sample period studied. However, there were large forecasting errors for the basic industries, consumer durables, and energy sectors and persistent large positive forecast bias in technology sectors.

2.5.2.2.2 Analysts' Forecast Errors as an Explanation Behind the Value/Growth Effect

According to La Porta (1996) and Dechow and Sloan (1997) stock prices 'naïvely' reflect analysts' forecasts of earnings growth. This causes certain degree of mis-pricing, which makes value stocks to be underpriced and growth stocks overpriced. The actual realisation of earnings following excessive optimism of analysts for growth stocks and pessimism for value stocks creates positive surprises for value stocks pushing their prices up and vice versa for growth stocks which justify the subsequent return difference between value and growth stocks. A number of studies show evidence that stock returns are sensitive to earnings surprises as they react positively to good news (positive surprises) and negatively to bad news (negative surprises). However, there has been no consensus view on whether surprises are systematically more positive for value stocks and systematically more negative for growth stocks in a way that can explain the superior long term performance of value strategies over growth strategies.

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La Porta (1996) showed that investment strategies that exploited errors in analysts' forecasts earned superior returns because expectations about future growth in earnings are too extreme. He sorted stocks into ten decile portfolios based on analysts' forecasts of earnings growth proxied by IBES forecasts over the period from 1982 to 1991.
He observed that the annual spread in absolute returns post-portfolio formation between the highest expected growth and lowest expected growth portfolios was 20.9%.
Both absolute and size adjusted returns decreased monotonically as one moved from the lowest expected growth to the highest expected growth portfolios. The results indicated that size factor did not account for the superior performance of the low expected growth portfolio. He also showed that both P/B ratio and P/E ratio generally increased as expected growth rates increased providing a link between the P/B or P/E effect and expectational error due to analyst' forecasts. Finally, event study showed that the market was overly optimistic about the earnings of high expected growth rate stocks and overly pessimistic about the earnings of low expected growth rate stocks. Earnings announcement return differences explain approximately 13% of the annual return differences between portfolios of low expected growth rate stocks and high expected growth rate stocks. Returns around earnings announcements provide an indication of the influence which analysts' expectations have on the expectations of the general market. These are in turn reflected in stock prices and fundamental ratios such as P/B, P/E, P/Sales or P/CF. The behaviour of returns around earnings announcement dates strongly supports the expectational error hypothesis based on analysts' forecasts of earnings growth.

Dechow and Sloan (1997) provided further evidence that naïve reliance on analysts' forecasts of future earnings growth can explain the returns to contrarian investment strategies.
They sorted stocks into ten decile portfolios based on analysts' forecasts of earnings growth proxied by IBES forecasts over the period from 1981 to 1992. Their results showed evidence of systematic biases in analysts' forecasts. Analysts had overestimated future earnings growth for all portfolios. The magnitudes of negative forecast errors increased monotonically as one moved from the lowest expected growth to the highest expected growth portfolios.
Further, the results showed that the highest expected growth portfolios not only had more negative errors but lower future stock returns indicating that abnormal performance of value strategies was driven by analysts' forecast errors. They also extended their studies using regression analysis to determine the proportion of returns to contrarian strategies that can be attributed to expectational error based on analysts' forecasts of earnings growth. The one-year and five-year buy-and-hold returns for each contrarian strategy based on P/B, P/E an P/CF ratio showed that more than 50% of the returns to contrarian strategies can be attributed to investors' naïve reliance on analysts' forecasts of earnings growth.

Levis and Liodakis (2001) assessed the relationship between earnings surprises and contrarian strategies in the UK market from 1987-1997. They analysed the distribution of average earnings surprises for different value and growth portfolios based on P/B, P/E, P/CF and past EPS growth. The results showed that although analysts are on average more optimistic for value stocks, there was a substantial amount of positive surprises particularly among low P/E and P/CF stocks. They further studied the effect of positive and negative earnings surprises on the returns of value and growth portfolios by employing a simple portfolio approach and a multivariate regression framework. According to them, if investors are making systematic errors in their expectations, they are expecting growth stocks to do well in the future and value stocks to do poorly. Therefore, the market may regard a positive surprise to be good news for value stocks and the surprise will have a more positive impact on value stocks' returns than on the returns of growth stocks. Similarly, the market may consider a negative surprise to be bad news for growth stocks; thus, the surprise will have a negative impact on the growth stocks' returns while having only a minor effect on the returns of value stocks. Their results based on simple portfolio approach showed that value portfolio of stocks with positive surprises outperformed growth portfolio of stocks with positive surprises consistent with expectational error hypothesis. The regression results did suggest that positive and negative surprises have asymmetrical effects on returns of value and growth portfolios in favour of the value stocks consistent with the expectational error hypothesis. Their results provided evidence that naïve reliance on analysts' forecasts of future earnings growth can explain the returns to contrarian investment strategies.

However, Harris and Marston (1994) contradicted the results of La Porta (1996), Dechow and Sloan (1997) and Levis and Liodakis (2001). They showed that by tracking returns on portfolio strategies based on P/B ratio and growth expectations measured by analysts' forecasts on five years earnings growth rate independently; the two strategies yielded different results. The portfolio post-formation spread in returns for the portfolios sorted on price-to-book ratio was higher at 10.7% than the portfolios sorted on analysts' forecasts which had a spread in returns of 7.8%. This implied that the value premium cannot have been solely explained by the systematic biases in analysts' forecasts; analysts' forecasts are only a part of the value premium.

La Porta, Lakonishok, Shleifer and Vishny (1995) also recorded similar conclusions as Harris and Marston (1994) whereby the mis-pricing of future growth prospects does not explain fully the premium performance of value strategies. They studied the stock price reactions around earnings announcements for value and growth stocks to determine whether investors make systematic errors in pricing. They conducted an event study to determine whether earnings surprises in the five years after portfolio formation are

systematically positive for value firms and negative for growth firms. They used two different definitions for the classification of value and growth stocks: the first method used price-to-book ratio and the second method used a two-way classification based on low (high) price-to-cash flow and low (high) past growth in sales for value (growth) stocks. They computed earnings announcement returns quarterly over a three day window around earnings publication dates over a period of five years after portfolio formation.
These earnings announcement returns were then compared with annual buy and hold returns. The results showed that event returns around were substantially higher for value portfolio of stocks compared to growth portfolio of stocks. Earnings announcement return differences explained approximately 25%-30% of the annual return differences between portfolios of value and growth stocks in the first two to three years after portfolio formation and approximately 15%-20% of return differences over years four and five after formation. The persistence of positive relative earnings surprises for value stocks long after portfolio formation was consistent with the results of many studies that the superior returns to value stocks persist long after portfolio formation. However, the magnitude of earnings surprises diminished more rapidly than the annual return differences between value and growth stocks. This observation suggests that earnings surprises may not be the sole explanation behind the superior returns of value stocks. There may be other behavioural and institutional factors that may have a role in the explanation.

Similarly, Bauman and Dowen (1994) also showed that earnings surprises do not provide a statistically significant explanation about earnings yield anomaly, although there appeared a tendency for analysts to overestimate their forecasts of earnings for growth stocks compared to value stocks.

Similarly, Fuller, Huberts and Levinson (1993) showed that forecasts were approximately equal across different portfolios formed on P/E ratio. They concluded that it was unlikely that overly optimistic and pessimistic forecasts for growth and value stocks provided the explanation behind the differential performance between the value and growth portfolios over the eighteen years (1973-1990) covered in their study.

Bauman and Miller (1997) also showed evidence that earnings surprises do not provide consistent explanations for the value-growth premium. Their analysis on portfolios of value and growth stocks formed on P/B ratio showed that the analysts' earnings forecasts was least optimistic for growth stocks whilst most optimistic for value stocks resulting in larger negative surprises for value stocks contradicting the expectational error hypothesis.

The studies by Fuller et al (1993) and Bauman et al (1997) above highlight that there is no consensus view on whether surprises are systematically more positive for value stocks and systematically more negative for growth stocks in a way which provides a general explanation for the superior long term performance of value strategies over growth strategies.

2.5.2.3 Portfolio Flows

Overreaction may also be caused by portfolio flows. Empirical and academic studies suggest that there is a link between portfolio flows and stock market returns. Harris and Gurel (1986), Shleifer (1986), Jegadeesh and Titman (1993) and Warther (1995) showed evidence that stock prices overreact to portfolio flows - once 'price pressure' or investor sentiment wave has passed;, stock returns exhibit reversals to levels in line with fundamental value of underlying stocks. Excessive positive portfolio flows and negative portfolio flows causes a certain degree of mis-pricing in the equity markets which makes value stocks to be underpriced and growth stocks overpriced. Price pressure and extrapolation hypothesis are similar as they predict that returns are mean reverting and strategies that exploit the mis-pricing in stock returns produce abnormal returns which may explain the superior returns of underpriced and ignored 'value' stocks. By inferences, the studies seem to suggest that there may be a negative relationship between portfolio flows (lagged and contemporaneous) and subsequent returns.

Warther (1995), Levis and Thomas (1999) and Bennett and Sias (2001) showed the existence of a strong positive correlation between returns and contemporaneous fund flows consistent with 'fund flow theory'. Positive fund flows driven by investors indicate excess demand whereas negative fund flows driven by investors indicate excess supply.
Positive flows equate stock price increases and negative flows equate stock price decreases.

Bennett and Sias (2001) also showed that fund flows exhibited strong positive serial correlation. The regressions of money flows on lagged money flows revealed that stocks with high money flows subsequently experienced high money flows i.e. recent money flows was able to forecast future money flows. The regressions using 40 day lead money flows on 40 day lag money flows had an average adjusted R^2 of more than 16%.
Their results confirmed that money flows explained a substantial variation in future money flows especially at longer lags.

Levis and Thomas (1999) also conducted similar regressions of contemporaneous flows against lagged flows of institutional and retail investors into/out UK traded mutual funds. Their analysis showed positive and significant coefficients on lagged flows consistent with the results of Bennett et al. The observations from both studies were consistent with the hypothesis of persistence in excess demand and supply due to 'herd-like' behaviour of investors.

Bennett et al conducted further regressions which showed a statistical significant relationship between returns and lagged money flows. Bennett and Sias therefore concluded that fund flows can be used to predict future fund flows and future returns i.e. positive relationship between fund flows and future returns. However, this contradicted the results of Warther (1995) who showed that lagged flows lose their significance in explaining stock returns once contemporaneous flows were removed from the regressions. Warther's results showed that a combination of contemporaneous and lagged flows produced an R^2 of 0.52 with returns positively correlated to contemporaneous flows but negatively correlated to lagged flows. However, the removal of contemporaneous flows from the regressions, leaving behind the lagged flows as independent variables, produced an R^2 of -0.02 with the coefficients on lagged flows statistically not significant.

Empirical research suggests three theories account for the link between fund flows and stock returns:

2.5.2.3.1 Feedback Trader Hypothesis

Feedback Trader Hypothesis predicts that fund flows lag returns. This is because both flows and returns exhibit serial correlation. Empirical analysis has shown that investors tend to direct their investments into markets or mutual funds with good past performance and away from markets or mutual funds with poor past performance i.e. high past returns turn investors bullish.

Schartstein and Stein (1990) showed that there is persistence in fund flows due to 'herd-like' behaviour of investors – Institutional investors have an incentive to follow other institutional investors in the same stock. Their model suggested that for an investor to be alone and wrong is more costly than for an investor to be with the herd and wrong. They concluded that fund flows are positively correlated with lagged flows and lagged returns.

McQueen, Pinegar and Thorley (1996) claimed that fund managers follow momentum strategies asymmetrically. Specifically, managers follow positive feedback strategies only after good news buying past winners but not selling past losers.

Studies by Barclay and Warner (1993), Sias and Bennett (1997), Chan and Lakonishok (1995) suggested that large investors execute their trades over extended periods to minimise the price impact of their trading. For many institutional investors, even a moderately sized position in a stock may represent a large fraction of the stock's trading volume. Accordingly, an investment manager's order is often broken up into several trades. Chan et al (1995) showed that when institutional trades were analysed in terms of packages, purchases were associated with a price change of almost 1% from the open on the package's first day to the close on its last day. The corresponding price change of –0.35% for sell packages was less dramatic but still sizeable. This type of order-splitting behaviour by groups of large investors causes fund flows to be positively correlated with lagged flows and lagged returns.

2.5.2.3.2 Information Revelation by Fund Flows

Warther (1995) suggested that information revelation is an explanation for a positive relationship between fund flows and subsequent returns. If investors possess information, or merely trade in the same direction as another group of investors who possess information, then their trades will be associated with new information. As the market responds to this information revelation, price will move in the same direction as the fund flows affecting subsequent returns in the same direction. Here, the market is reacting efficiently to new information. The stock price will move in line with the sentiment defined by the flows until it is perceived to have reached a valuation level more than justified by its underlying fundamentals.

2.5.2.3.3 Price Pressure Hypothesis

Price pressure hypothesis predicts that fund flows exert price pressures on stock returns. Harris and Gurel (1986), Shleifer (1986) and Warther (1995) showed evidence that once the price pressure or investor sentiment wave has passed, stock returns exhibit reversals to levels in line with fundamental value of the underlying stocks. Price pressure hypothesis predicts that there exists a negative relationship between fund flows and subsequent returns.

Jegadeesh and Titman (1993) analysed the returns of winners minus losers portfolio formed on the basis of past performance. The portfolio realised positive returns in each of the twelve months post-portfolio formation but lost more than half of its return in the following twenty-four months. Their evidence of initial positive relative strength returns is consistent with feedback trader hypothesis and the later negative relative strength returns is consistent with price pressure hypothesis.

Studies by Kamesaka, Nofsinger and Kawakita (2003) showed that large institutional investors in the Japanese market benefit from positive feedback trading.

However, individual investors who used positive feedback trading in their market timing earned low returns. This highlights that once the 'large wave' of buying by institutions is completed, price pressure sets leading stock prices to mean-revert. This causes the last marginal individual traders to either benefit marginally or suffer from losses.

Similarly Bekaert, Harvey and Lumsdaine (2002) in their analysis on emerging markets showed evidence that positive return shocks are followed by increased short-term equity capital flows indicating a momentum effect. However, the effect immediately dies out consistent with price pressure hypothesis. Their analysis of portfolio flows into emerging markets from pre-market liberalisation to post-market liberalisation periods suggest that after a liberalisation, equity capital flows increase on an annual basis for up to three years; thereafter upon which flows are reduced. They also showed that when capital leaves, it leaves much faster than when it came which sheds light on the recent crises in Latin America and Asia.

2.5.2.4 Other Behavioural Factors

Shleifer and Vishny (1997) made use of limits-to-arbitrage approach to explain the value/growth effect. They claimed that the concept of efficiency in markets is based on the assumption that most investors see the available arbitrage opportunities and take them. Excess returns are eliminated by the action of a large number of such investors, each with only a limited extra exposure to any one set of securities. They argued that the theoretical underpinnings of the efficient markets approach to arbitrage are based on a highly implausible assumption of many diversified arbitrageurs. According to Shleifer et al, in reality, arbitrage resources are heavily concentrated in the hands of a few investors that are highly specialised in trading a few assets and are far from diversified. As a result, these investors care about total risk and not just systematic risk. Since the equilibrium excess returns are determined by the trading strategies of these investors, looking for systematic risk as the only potential determinant of pricing is inappropriate.

Shleifer et al suggested a different approach to understanding anomalies such as the value/growth evidence. Their approach instead would be to identify the pattern of investor sentiment responsible for this anomaly as well as the costs of arbitrage that would keep the persistence in the anomaly. With respect to risk, the conventional arbitrage of the value/growth anomaly is simply taking a long position in a diversified portfolio of value stocks. Over a long term period of over five years, the superior performance has been much more likely compared to over-short horizon where the arbitrage returns on the value portfolio are volatile. Even though this risk may be idiosyncratic, it cannot be hedged by arbitrageurs specialising in this segment of the market. Because of the high volatility of the hedge strategy and the relatively long horizon it relies on to secure positive returns with a high probability, it is likley to be shunned by arbitrageurs or they are only willing to take limited positions, particularly those with a short-term track record. Shleifer et al's approach further implies that in extreme situations. arbitrageurs trying to eliminate the value/growth mispricing might lose enough money that they have to liquidate their positions. In this case, arbitrageurs may become least effective in reducing the mispricing precisely when it is the greatest. One illustration of this in the present context is the collapse of many hedge funds in 1998, which reduced the money available for arbitrage activities.

According to Shleifer et al, anomalies such as the value/growth effect have a high degree of unpredictability which makes betting against them risky for specialised arbitrageurs. However, unlike in the efficient markets model, this risk need not be correlated with any macroeconomic factors and can be purely idiosyncratic fundamentals or a noise trader risk. Of course, they did accept that the specialised arbitrage approach assumes that only a relatively small number of specialists understand the return anomaly well enough to exploit it, may be questionable as in the case of anomalies like the value/growth anomaly or the small firm anomaly where there is now much published work. As more investors begin to understand an anomaly, the superior returns to the trading strategy may be diminished by the actions of a large number of investors who each tilt their portfolios toward the underpriced assets. They admitted that the specialised arbitrage approach is clearly more appropriate for difficult to understand new arbitrage opportunities than it is for well-understood anomalies. However, Shleifer et al argued that the anomalies become understood very slowly and that investors do not take definitive action on their information until long after a phenomenon has been exposed to public scrutiny. A "noisy" anomaly like the value/growth effect is accepted only slowly even by relatively sophisticated investors.

Further, Shefrin and Statman (1995) claimed that cognitive biases with limits-to-arbitrage explain the glamour/growth stocks and the superior performance of value stocks.
They argued that noise traders make cognitive errors that lead to the belief that good stocks are stocks of good companies. Therefore, these investors prefer growth/glamour strategies over value strategies. Shefrin et al analysed the Fortune magazine surveys of 311 company reputations and found that the survey respondents ranked stocks based on large size and high P/B ratio as 'good' companies. Hence, this results in cognitive errors that lead most investors to simply equate a good investment with a well run company irrespective of its price. Information traders and fund managers do not nullify this effect through arbitrage. The reason for this is that the professionals also have a preference for growth/glamour strategies because their clients who have expectations of them often make it difficult to pursue their own best judgement; clients often expect the professionals to invest according

to fads. Their clients are more forgiving of losses on stocks of good companies than losses on stocks of bad companies.

Lakonishok et al (1994) presented a similar explanation in that institutional investors may prefer growth/glamour stocks although they are aware of the expected returns of value stocks. As pointed by Jagadeesh, Kim, Krisahe and Lee (2004), growth/glamour stocks appear to be 'prudent investments' with their recent performance track record, more positive price momentum and more positive accounting accruals, and hence; are easy to justify to their client sponsors.

The expanding availability of around-the-clock financial news coverage and on-line information could have also contributed to overreaction. The growing popularity of US based 401(k) plans results in large inflow of funds in large capitalisation liquid stocks. This causes bubbles fuelled by investor enthusiasm.

Daniel, Hirshleifer and Subrahmanyam (2001) suggested that biased learning can cause traders based on experience, to become more overconfident instead of converging towards rationality. They argued that suppose arbitrageurs initially are not sure whether there are overconfident traders in the market and that some sort of noise prevents an arbitrageur from instantly and perfectly inferring the information from overconfident traders.
Over time, by statistical analysis of the history of fundamentals and prices, arbitrageurs will learn that other players were infact overconfident. This encourages more aggressive contrarian strategies. Thus, Daniel et al's interpretation of the high predictability of stock returns over the last several decades is that some investors are overconfident and this was not fully recognised by other investors (arbitrageurs) who could have exploited this. Their interpretation suggests that as arbitrageurs' expectations become more accurate, anomalous predictability of returns should diminish but not vanish. They also went a step further to suggest that arbitrageurs themselves could be overconfident about their abilities to identify statistical patterns and could be too attached to the patterns they have identified. If so, then mispricing effects could fluctuate dynamically over time.

The above cognitive biases and limitations on arbitrageurs' actions led to the recent TMT bubble in the late 1990s where the market believed that recent large scale and widespread technological advances have rendered obsolete the conventional approach to valuation in selected industries. Companies that are in the forefront of innovation that have exhibited dazzling growth rates in recent past will continue to soar in defiance of the low average returns they have historically earned. These led most investors to believe that the technology sector represented an attractive investment and investors should not be deterred by valuations that are high by historical standards. The success of the sector fuelled investor enthusiasm which pushed valuations even further.

Such cases of severe mispricing would be eliminated if arbitrageurs had complete freedom to exploit all opportunities but as Shleifer et al noted, in practice, arbitrageurs' actions have limitations. As a result, cognitive biases with limits-to-arbitrage cause stock prices to exhibit large and persistent departures from fundamental values that can last several years. Of course, as the operating performance of these companies could not keep up with investors' expectations reflected in the rich valuations accorded to these stocks, we observed mean reversion in their prices. This led to the bursting of the TMT bubble and superior performance of ignored 'old economy' value stocks.

Chan, Karceski and Lakonishok (2000) also believed that both cognitive and extrapolative biases led to the superior performance of large-cap growth stocks relative to small-cap and mid-cap value stocks in the US equity market during the TMT bubble period. They showed evidence that the recent strong performance of the large-cap growth stocks relative to small-cap and mid-cap value stocks in the late 1990s was due to investors and analysts' overlooking the lack of persistence in growth rates. They showed that although large-cap growth stocks exhibited price performance in excess of their historical average, they did not enjoy a parallel surge in operating performance. Large-cap growth stocks had rich valuations reflecting investors' rosy expectations of the companies' future growth and ability to sustain that growth. Conversely, small-cap and mid-cap value stocks fell out of favour with investors, even though their recent operating performance was not poor. Chan, et al showed that large-cap growth portfolio of stocks had P/S multiple of 2.13 in 1997 which more than doubled in 1999 to 4.20. The historical 1970-1998 average was only 1.38. The small-cap and mid-cap value stocks did not see such expansion in their P/S multiples. However, the large-cap growth stocks did not experience superior operating performance defined by sales growth to justify their P/S premium and astonishing stock price performance. The large-cap growth stocks observed 6% p.a. growth in sales from 1996 to 1998. This was lower than the mean of 10.3% for the large-cap growth stocks over the period 1970-1998. Moreover, the small-cap and mid-cap value stocks had relatively favourable growth rates in sales – an average of 12.7% and 9.7% p.a. for respectively the small-cap and mid-cap value stocks during the period 1996 to 1998. Post 1999, we observed the mean-reversion in stock prices as the operating performance of large-cap growth companies could not keep up with investors' expectations reflected in the rich valuations. This resulted in the return of the superior performance of small-cap and mid-cap value stocks relative to large-cap growth stocks.

The above illustration of cognitive biases in behaviour are in accordance with the theory of bounded rationality as highlighted by Radner and Rothschild (1975), Gary Becker (1976, 1993) Amartya Sen (1977), John Conlisk (1979,1983,1996), Ronald Heiner (1983,1989) and Shefrin and Statman (1985,1994) to explain anomalies unexplained by economic models and asset pricing models based on market efficiency. Cognitive dissonance (the bias of fitting beliefs to convenience), focus on limited searches over possible decisions to economise on transaction costs, myopia, loss aversion, adoption of rules of thumb or norms which have errors, deliberation costs (actions constrained by income, time & other limited resources), adaptive expectations, imitations are suggestions as plausible causes of bounds on rationality. According to the authors on behavioural finance, anomalies are therefore not surprising relative to economic theories or asset pricing theories which neglect bounded rationality. Lawrence Summers (1986) aptly summarised that the evidence found in many studies that the hypothesis of market efficiency cannot be rejected, should not lead us to conclude that market prices represent rational assessments of fundamental valuations. Rather we must face the fact that most of our theories and tests have relatively little power against certain types of market inefficiency.

Another explanation by Rozeff and Zaman (1997) for the superior performance of value strategies is based on the following hypothesis:

If value stocks are underpriced and growth stocks overpriced, then corporate insiders (chairmen, officers and directors) who are technically informed investors have arbitrage opportunities. They are able to focus on greater buying of value stocks and greater selling of growth stocks, hoping to profit by the eventual reversion of market prices determined by their underlying fundamental values.

Campbell and Cochrane (1999) presented a consumption based model to explain the procyclical variation and long-horizon predictability of stock returns. The consumption based model is driven by an independently and identically distributed consumption growth process and adds a slow-moving external habit to the standard power utility function. Habit formation has a long history in the study of consumption. Campbell and Cochrane's habit specification made use of the features that habit formation is external - i.e. an individual's habit level depends on the history of aggregate consumption rather than on the individual's own past consumption. Secondly their specification also made use of the premise that habit moves slowly in response to consumption. This feature produces slow-mean reversion in stock price movements. Their consumption based model helps provide explanation behind the variation in equity risk premia with market cycles and may provide an explanation behind the value/growth spreads during recessions and economic booms.

2.5.2.5 Research Biases

Various literature have attributed the superior performance of value strategies to research biases such as survivorship bias and data snooping.

Kothari, Shanken and Sloan (1995) claimed that value strategies appear to work because of the inherent survivorship bias in the Compustat sample. They suggested that the results of Fama and French might have been influenced by a combination of survivorship bias in the Compustat database and period specific performance of both low P/B, past 'loser' stocks and high P/B, past 'winner' stocks. This survivorship bias is due to Compustat's major expansion of its database in 1978.
Typically, for smaller market capitalisation stocks, only those with five years past performance track record were added into the database. This could potentially explain the association between small size and high returns of low P/B firms observed in the Fama and French results. They argued that 'loser' stock prices tended to bunch in a few years following bear markets and are extremely sensitive to any mis-pricing or microstructure-induced effect. To explore the survivorship bias problem in the Compustat data, they separately analysed data for firms on CRSP and Compustat databases as well as firms on CRSP but not on Compustat database. They showed that consistent with survivorship bias hypothesis, the returns of small firms on the Compustat database are about 10% higher than the small firms on the CRSP excluding Compustat database. They further tested the relationship between P/B and average stock returns on a different universe sample such as the 500 largest Compustat firms which does not suffer from survivorship bias problem. They showed that the size of the coefficient was reduced by 40% although the relationship remains significant. This led them to conclude that the empirical case for the P/B effect is weaker than the previous literature suggest.

Mackinlay (1995) also suggested that stock market anomalies may the result of data snooping. As finance academics research through the same data, it is more likely to find patterns in average returns like the P/B effect that is inconsistent with CAPM but may be sample specific.

However, studies by Chan, Jegadeesh and Lakonishok (1995) suggested that sample selection bias does not explain the difference in returns between value and growth stocks. They showed that the discrepancy between CRSP and Compustat as the source of bias on the results by Fama and French is not as severe a problem as feared by Kothari, Shanken and Sloan (1995). They examined the intersection of companies between CRSP and Compustat databases. Closer examination suggests that the relevant intersection between

CRSP and Compustat is the set of domestic primary companies (after excluding closed-end funds, REITs and trusts, ADRs and foreign companies), the proportion of CRSP primary domestic firms missing from Compustat is not large at 3.1%. Mechanical problems with matching CUSIP identifiers account for much of the discrepancy between CRSP and Compustat.

It is true that most studies are often conducted in the US market that may fall victim to data snooping. However, empirical and academic studies on international markets produced relationships between returns and valuation ratios such as P/B, P/E, P/CF, P/Sales and dividend yield. This provides evidence that data snooping may not be a convincing explanation behind the value/growth effect.

Chapter 2 – Literature Review

Chapter 3
Data and Methodology

Chapter 3 – Data and Methodology

3.1 Data and Sources

This chapter describes the data used in this thesis. It also analyses the methodology that was employed for the construction of portfolios that are common to multiple chapters in the thesis. A brief discussion of alternative methodologies is also provided. We provide a separate reference to data and methodologies at the beginning of each empirical chapter for the chapters that utilise different data samples, variables or methodologies based on the objectives and hypotheses tested.

Company specific data used for this thesis was sourced from Worldscope and Institutional-Brokers-Estimates-System (IBES) obtained through Factset Limited. Factset Limited brings together data from a variety of different sources such as company financials, security prices, earnings estimates/forecasts, corporate news, filings and corporate descriptions.

Data on accounting variables, price and price returns was obtained from Worldscope. Worldscope is a commercially available database that contains descriptive, financial, fundamental and stock price data for global corporations. Data covered by Worldscope account for over 90% of global equities by market capitalisation. The compilers of Worldscope also standardize the reported balance sheet, income statement and cash flow data by taking into consideration the wide variety of accounting standards and conventions used throughout the world. Appendix 1 shows a comparison of the different commercially available databases such as Worldscope, MSCI and S&P/Citigroup based on the number of companies covered. The observations in Appendix 1 highlights that Worldscope provides a more comprehensive coverage of companies for different markets in Asia compared to the other databases.

Analysts' earnings forecasts are taken from IBES. Stock analysts contribute their earnings forecasts for the current fiscal year FY0, FYI, FY2, FY3 as well as forecasts of the expected long-term earnings growth rate. The forecasts refer to earnings per share before extraordinary items. In general, the long term growth forecasts refer to a period of between three to five years but this is typically very sparsely covered for the Asian universe of companies. The measures of expected earnings, earnings growth rates, number of analysts covering the stock are drawn from the monthly IBES History Tape.

Data on US net portfolio flows into each country primarily used in Chapter 7 was obtained from the monthly publication by US Federal Reserve Bank. Chapter 7 contains further details on data and data treatment related to US net portfolio flows. Bekaert and Harvey (2003) and Bekaert, Harvey and Lumsdaine (2002) made use of similar data in their analysis on the role of portfolio flows on Emerging market stock returns.

Chapter 3 – Data and Methodology

A common problem identified in many studies is survivorship/look-ahead bias as highlighted by Banz & Breen (1986) and Kothari et al (1985). The use of Worldscope database enables us to avoid this problem as there is no back tracking of data and Worldscope maintains records of companies delisted from the exchange at some point in time due to merger, take-over or bankruptcy. Please refer to Section 3.4.2 which discusses how we treat delisted companies in our sample study.

Our analysis covers Japan and other Asian markets in the MSCI Far East ex Japan Index. Table 3.1 below, shows research periods used for each market in the thesis. It also shows inception dates of universe data in each market covered by the different commonly available databases. The number of companies available in each database is shown in Appendix 1. Appendix 2 provides a summary of political and economic events affecting the markets over the research period. As pointed by Harvey (1995), emerging stock market returns are influenced by local factors. The research period marks some of the worst economic periods faced by many of these markets particularly the Asian financial crisis and currency devaluations in 1997/1998 period.This enables us to test the consistency of our conclusions during periods of heightened economic uncertainty. We also show summary statistics of valuation ratios (P/E, P/B etc) over each of the research periods in Appendix 4. We observe a reduction in the value of the valuation ratios and number of companies with positive book values and earnings during 1997/1998 period. Investor confidence and portfolio flows into this region affected the prices of many stocks in this region and hence their valuation ratios. Chapter 4 provides further depth on the performance of value and growth stocks over three subperiods: prior to the Asian crisis, during and post Asian crisis which includes the technology bubble period of 1999/2000. Chapter 5 discusses the implications on the performance of value and growth stocks caused by the Asian economic crisis in select markets.

Table 3.1 – Time Periods used in the Sample Study as well as Inception Dates for each market covered by the different databases

Country	Time periods used in our study	Inception date for S&P/Citigroup	Inception date for for MSCI	Inception date for Worldscope
Hong Kong	June 1990 – June 2001	July 1989	December 1972	1979
Indonesia	June 1993 – June 2001	December 1994	December 1987	1990
Japan	June 1990 – June 2001	July 1989	December 1969	1979
Korea	June 1993 – June 2001	December 1994	December 1987	1979
Malaysia	June 1993 – June 2001	July 1989	December 1987	1979
Philippines	June 1994 – June 2001	December 1994	December 1987	1988
Singapore	June 1990 – June 2001	July1989	December 1972	1979
Taiwan	June 1994 – June 2001	December 1994	December 1987	1989
Thailand	June 1993 – June 2001	December 1994	December 1987	1987

Source: S&P/Citigroup, MSCI, Worldscope

Notes for Table 3.1

i) There is no survivorship/look-ahead bias as the history for all the three databases has been created with 'live' data such that backfilling of data is not required.

ii) The final rebalancing of porfolios in our sample study occurs in June 2000.

Chapter 3 – Data and Methodology

We base our research period post 1990 for the major markets such as Japan, Hong Kong and Singapore and post 1993 for the rest of the smaller Asian markets. This is to take into consideration availability of consistent data and foreign institutional investability. Besides, the Citigroup Indices which we have used as a comparative index for many of these Asian Markets make use of inception dates from mid 1989.

The capital markets of most of these countries in our sample were immature and lacked depth before the governments of these countries pursued policies of capital market reforms including capital market liberalisation in the late 1980s. Bekaert and Harvey (2000) documented a clustering of liberalisations in the late 1980s and early 1990s. These included the gradual relaxation of restrictions on foreign ownership limits, restrictions governing convertibility of foreign exchange, repatriation of capital gains and payment of dividends. Moreover, a majority of the industries in these markets were government owned and were slowly being privatised in the late 1980s. This led to significant liquidity and influx of foreign capital into the capital markets of most of these countries only in the 1990s.

For example, foreign investors were only able to participate in the Thailand market as late as 1987 and that too under strict rules governing the repatriation of profits, foreign exchange conversion and payment of dividends. Only in 1991, several rules regarding repatriation of profits and conversion of foreign currency were finally relaxed. As for Malaysia, there was a 30% cap on foreign ownership of any firm even as late as 1991 which was only removed in mid 1993. Then during the financial crisis in October 1998, Malaysia re-imposed currency controls in an attempt to stem foreign capital flows. During that period from peak in early 1997 to trough in 1998, the Malaysian stock market lost more than 85% of its value in USD terms. Japan is an exception but it benefited from capital investment into the smaller Asian markets which helped them to develop into Asian Tigers.

3.2 Software

Alpha Testing

Alpha Testing is a tool that enables one to analyse the relationship between one or more variables and subsequent investment returns over time. Alpha Testing groups a universe of stocks into fractiles sorted on either a single factor variable (P/B, P/E, P/CF, P/Sales, P/D) or a multi-factor composite valuation criteria. It then calculates subsequent returns for each fractile. This thesis employs the use of Alpha Testing in its style portfolio construction process as discussed further in detail in Section 3.4.2.

Chapter 3 – Data and Methodology

In order to calculate subsequent returns for each fractile, Alpha-Testing draws discrete monthly total returns of companies from Worldscope database which includes price returns including dividends re-invested.

Simple return of a company between dates t-1 and t is defined as

$$R_t = \frac{P_t}{P_{t-1}} - 1$$

where P_t is the price of an asset at date t.

For stocks that make periodic dividend payments, the above equation is modified to the following:

$$R_t = \frac{P_t + D_t}{P_{t-1}} - 1$$

where P_t is the ex-dividend price of a company at date t

Consistent with other studies and amongst practitioners in the industry, Alpha-Testing then annualizes multi-year returns as follows:

$$\text{Annualised}\,[\,R_t(k)\,] = \left[\prod_{j=0}^{k-1}(1+R_{t-j})\right]^{1/k} - 1$$

All portfolio performance in this thesis is displayed on an annualised basis to make investments with different horizons comparable.

In some cases, we also show graphs of portfolio compound returns to show the portfolio's return over the periods from date t-k to date t. This is simply equal to the product of the k single-period returns from t-k +1 to t as follows:

$$[\,R_t(k)\,] = \left[\prod_{j=0}^{k-1}(1+R_{t-j})\right] - 1$$

For a complete discussion on discrete and continuously compounded returns (log returns) see Chapter 1 of Campbell, Lo and McKinlay (1997)

EViews

EViews is a statistical package that provides data analysis, regression and forecasting tools on Windows-based computers. We employ EViews to conduct data analysis as described later in this chapter. Chapter 5 of the thesis investigates the significance of the theoretical drivers behind the valuation ratios which are used as proxies for classifying value and growth stocks. We employ cross-sectional regression methods using EViews statistical package to determine the statistical significance of the theoretical drivers and their respective coefficients.

3.3 Description of Company Specific Variables

We use a number of accounting and company specific variables as described below to construct portfolios as well as document descriptive studies. We have also standardized a number of definitions in the reported balance sheet, income statement and cash flow data so as to cut across the differences in accounting standards used across the sectors and countries covered in the sample universe.

Book value

Common equity plus reserves for the fiscal year ending t-1

Cash flow

Net income as stated below plus depreciation minus retained share of associates for the fiscal year ending t-1

Dividends

Total annual common dividends for the fiscal year ending t-1

Net income

Profits after tax, minority interests and preferred dividends but excluding extraordinary items for the fiscal year ending t-1

Sales

Net sales or revenues for the fiscal year ending t-1

Share price

Closing market share price which represents the average of bid and ask. The price is adjusted for rights, splits and other corporate changes

Share outstanding

Time weighted average number of shares outstanding during the fiscal year ending t-1. Share outstanding is used as a denominator for calculating book value per share, net income per share, sales per share and dividend per share

Valuation ratios

P/B - Price to book ratio
P/E - Price to earnings ratio
P/CF – Price to cash flow ratio
P/Sales - Price to sales ratio
P/D - Price to dividend ratio (inverse of dividend yield)

The above valuation ratios are calculated using closing market price as at end June of fiscal year t divided by the accounting values based on fiscal year ending t-1. For example P/B refers to closing market price as at end June of fiscal year t divided by book value for the fiscal year ending t-1. We use end June for the computation of valuation ratios as our portfolios are formed at the end of June each year.

P/B, P/E, P/CF, P/Sales and P/D are the key valuation ratios used in formulating different value and growth portfolios. Consistent with other studies (Reiganum (1981), Basu (1983), Fama & French (1995), La Porta et al (1995), Barbee et al (1996), Levis & Liodakis (1999)), we only make use of companies with positive valuation ratios for P/B, P/E and P/CF and available data for P/Sales and P/D ratios (P/Sales and P/D ratios are never negative). For further discussion on data censoring, please see Section 3.4.2.2

We present the number of companies with valid data (Positive P/B, P/E, P/CF and available P/Sales and P/D ratios) in Table 3.2.

Chapter 3 – Data and Methodology

Table 3.2 – Number of Stocks with Valid Data (Positive Valuation Ratios)

Panel A: Hong Kong	P/B	P/E	P/CF	P/Sales	P/D
1990	101	94	58	101	95
1991	112	102	58	112	101
1992	142	135	76	142	129
1993	153	145	92	153	143
1994	163	158	97	163	151
1995	257	245	157	257	243
1996	401	339	212	402	354
1997	450	387	259	452	373
1998	458	357	233	464	372
1999	452	270	174	469	328
2000	444	336	245	468	269
Panel B: Indonesia	**P/B**	**P/E**	**P/CF**	**P/Sales**	**P/D**
1993	81	81	75	79	74
1994	95	92	89	95	90
1995	104	101	96	104	100
1996	133	131	121	135	125
1997	155	149	132	155	142
1998	146	88	81	158	144
1999	117	61	63	158	73
2000	122	124	117	158	53
Panel C: Japan	**P/B**	**P/E**	**P/CF**	**P/Sales**	**P/D**
1990	1634	1589	1154	1639	1501
1991	1986	1891	1425	1993	1840
1992	2085	1875	1402	2094	1952
1993	2167	1744	1298	2176	2005
1994	2245	1752	1302	2264	1986
1995	2327	1843	1381	2352	1986
1996	2381	1968	1476	2418	2011
1997	2421	2066	1549	2458	2076
1998	2446	1894	1423	2490	2127
1999	2436	1615	1224	2495	2060
2000	2420	1801	1561	2420	1040
Panel D: Korea	**P/B**	**P/E**	**P/CF**	**P/Sales**	**P/D**
1993	136	115	78	139	98
1994	208	177	115	212	154
1995	238	219	142	241	187
1996	264	211	170	270	217
1997	301	207	186	307	229
1998	292	160	196	322	230
1999	278	165	186	322	173
2000	278	216	214	321	157

Notes for Table 3.2

i) Reiganum (1981), Basu (1983), Fama & French (1995), Barbee et al (1996), Levis & Liodakis (1999) excluded companies with negative valuation ratios. Studies by Basu (1977), Cook and Rozeff (1984) and Dowen & Bauman (1986) have found that the effects of portfolio return rankings are essentially the same, whether stocks with negative EPS are included or excluded from portfolio groups. In fact, Chan et al (1991) who grouped stocks into 5 groups – Group 0 with negative P/E ratios, Groups 1-5 containing equal number of stocks ranked in ascending order of P/E ratios. Chan et al, have shown that relatively high return is achieved by stocks with negative P/E ratios outperforming many of the groups of stocks sorted on positive P/E ratios.

ii) In a portfolio model with a discrete investment horizon, such as CAPM, the simple discrete return is the appropriate variable (see Fama (1976))

iii) The final rebalancing of portfolios occurs in June 2000.

Table 3.2 cont/. – Number of Stocks with Valid Data (Positive Valuation Ratios)

	P/B	P/E	P/CF	P/Sales	P/D
Panel E: Malaysia					
1993	230	215	161	230	203
1994	231	212	162	232	215
1995	263	241	180	264	243
1996	377	344	253	378	340
1997	428	373	294	428	371
1998	433	290	238	450	383
1999	409	228	201	449	296
2000	394	278	236	448	259
Panel F: Philippines	**P/B**	**P/E**	**P/CF**	**P/Sales**	**P/D**
1994	61	52	41	61	31
1995	74	63	50	74	37
1996	104	92	70	104	53
1997	117	99	80	117	57
1998	118	86	60	118	52
1999	118	71	47	118	44
2000	116	71	52	116	45
Panel G: Singapore	**P/B**	**P/E**	**P/CF**	**P/Sales**	**P/D**
1990	58	57	27	58	55
1991	65	59	27	65	62
1992	105	96	62	105	93
1993	112	101	63	112	100
1994	116	102	68	116	105
1995	155	140	88	155	140
1996	220	194	137	221	197
1997	230	202	143	230	204
1998	232	185	137	233	202
1999	228	147	113	233	195
2000	220	184	141	234	179
Panel H: Taiwan	**P/B**	**P/E**	**P/CF**	**P/Sales**	**P/D**
1994	55	50	21	55	27
1995	118	116	57	120	53
1996	217	194	85	218	71
1997	236	207	81	236	93
1998	238	216	63	238	64
1999	235	164	39	236	53
2000	234	174	57	235	72
Panel I: Thailand	**P/B**	**P/E**	**P/CF**	**P/Sales**	**P/D**
1993	114	110	99	114	105
1994	219	197	160	219	192
1995	244	226	184	246	203
1996	258	237	186	261	214
1997	278	229	183	279	227
1998	246	147	127	278	205
1999	245	164	145	277	83
2000	235	140	124	277	103

3.4 Portfolio Construction

In order to determine whether style investment strategies can be applied in the Asian Equity Markets, value and growth portfolios need to be constructed and time series of returns computed. Academic literature has proposed two basic approaches to portfolio construction – either using simple univariate or multivariate approach to forming value and growth portfolios. We provide below a review of some of the portfolio construction methodologies and discuss in detail the approach applied throughout this study in Section 3.4.2.

3.4.1 Summary of Portfolio Construction Methodologies

3.4.1.1 Univariate Method

This is the simplest and most commonly adopted method in many academic literatures. This method is based on a single variable such as size, P/B, P/E etc and does not allow for inter-relationships between other variables. Reiganum (1981), Levis (1985,1989), Dechow and Sloan (1997) are amongst those that used this method of portfolio construction.

3.4.1.2 Multivariate Method

There are two approaches within the multivariate method as discussed below:

3.4.1.2.1 Within Groups Method

This method initially sorts stocks based on a chosen variable such as size and quintiles are formed. Then within each quintile, stocks are ranked on a second variable such as P/B and five new portfolios are formed within the original P/B quintiles. Twenty-five portfolios are created with each one containing approximately the same number of securities.

The twenty five portfolios created from the combination of size and P/B are then combined to form randomised portfolios. The value (low P/B) portfolio includes stocks from the low or first P/B quintile drawn from the entire set of size quintiles. This implies that value and growth portfolios will have different P/B ratios but similar market values (size). This set of portfolios is thus viewed as being randomised with respect to size. To construct size portfolios randomised with respect to P/B, then the portfolios need to be sorted by P/B first and then re-ranked by size. In this case, then small and large capitalisation stocks will have different market capitalisations but similar P/B ratios instead.

This method was employed by Banz (1981), Basu (1983), Cook and Rozeff (1984) and Levis (1989, 1995, 1999, 2001)).

3.4.1.2.2 Fama and French (1992, 1995) Method

Their method uses book-to-market value (B/MV) as proxies for value and growth stocks and market capitalisation as proxy for size.

Initially stocks are ranked on market capitalisation to form two groups using the median market capitalisation as the dividing line – small (S) and big (B). Simultaneously, stocks are also sorted on B/MV to form three fractiles based on the breakpoints for the bottom 30% (low B/MV), middle 40% (middle B/MV) and top 30% (high B/MV) of the ranked values of P/B.

Six portfolios are then constructed from the intersection of the two size and three B/MV groups (S/L, S/M, S/H, B/L, B/M, B/H). Their portfolios are typically constructed in June of each year t. Monthly market capitalisation weighted return on the six portfolios are calculated from July of year t to June of year t+1.

The returns of the small-capitalisation portfolio is the average of the returns on the three small-capitalisation portfolios (S/L, S/M, S/H) while the returns of the large-capitalisation portfolio is the average of the returns on the three large-capitalisation portfolios (B/L, B/M, B/H). These two portfolios would have roughly the same weighted average B/MV ratios. Similarly, value portfolios represent the average of the returns of the two high B/MV portfolios (S/H, B/H) while growth portfolios represent the average returns of the two low B/MV portfolios (S/L, B/L). These portfolios are thus neutralised against any size effect as they have roughly the same market capitalisations. Fama and French then constructed style spreads, SMB and HML. SMB is the monthly difference between the returns on small and large cap portfolios while HML is the monthly difference between the returns of value and growth portfolios.

The multivariate method of 'within-groups' and 'Fama and French' approaches result in neutralising one effect from another. However, they differ in terms of the number of securities produced in each portfolio. The within-groups method essentially creates portfolios with roughly the same number of stocks per portfolio. Fama and French method does not impose such a restriction. If there are very few stccks in the (S) and (L) groups, then the S/L portfolio will contain very few stocks.

3.4.1.3 Methodologies used by Index Providers

A number of commercial indices have been developed for the classification of value and growth styles. We describe them more in detail in Chapter 5.

In summary, MSCI, S&P/Barra style indices as well as some academic literature by Capaul et al (1983) construct stocks in the following method: Stocks are sorted on P/B ratio and the stocks with the smallest P/B values are classified as Value Index until one half of the total market value of the country index has been assigned. The remaining stocks with the larger P/B values that account for the other half of the market value of the country index are then assigned to the Growth Index. The weakness of this method is summarised in Chapter 5.

Frank Russell on the other hand utilises a probability algorithm over and above the P/B criterion as follows: Four quartiles are determined such that 25% of stocks with the lowest P/B ratios are in the first quartile. Then a non-linear probability algorithm is used to assign value/growth weights to each stock as follows: if a stock has a P/B ratio in the bottom 25%, it is assigned a value weight of 1.0; if a stock has a P/B ratio between the first quartile break and the median, it has a value weight between 0.5 and 1.0 with the weight declining in a non-linear fashion from 1.0 at the first quartile break towards 0.5 depending on how close to the median the stock is; the third quartile stocks has a value weight between 0.5 and 0.0; fourth quartile has a growth weight of 1.0.

Citigroup/S&P has developed a multifactor approach to classify its value and growth stocks instead of a single variable P/B. This is described in greater detail in Chapter 5.

3.4.2 Portfolio Construction Methodology and Portfolio Performance Calculation

3.4.2.1 Portfolio Construction

P/B, P/E, P/CF, P/Sales and P/D are the key valuation ratios used in formulating value and growth portfolios.

Similarly with Fama and French (1992), Chan et al (1991) Bauman et al (1998), we start the portfolio formation as at June of every year. More than 75% of the companies in our dataset have their fiscal year ends either in December or March and their results are typically released to the public in quarters 1 or 2 respectively. This ensures that portfolios are formed at best a minimum of 3-6 months after their respective fiscal year ends. We ensure therefore there is no look-ahead bias in forming portfolios in June of each year and that our tests are predictive in nature. It is to be noted that Basu (1977, 1983), Lakonishok et al (1994), Barbee et al (1996) have their portfolios implemented in April as the firms in their sample study have their fiscal year ends in December 31st . Similar to our study, they allow a gap of 3 months between fiscal year end and implementation of portfolios.

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We make use of an annual buy and hold strategy that avoids intra-year weighting so as to take into account of poor liquidity and high trading costs in some of the less developed Asian markets. Frequent rebalancing (e.g. weekly/monthly) will incur transaction costs, which are generally higher in Asia, and will have an impact on realised returns. Furthermore, some stocks in less developed Asia suffer from poor liquidity whereby they do not have high trading volumes or may not even trade at all. Hence frequent rebalancing is not possible for such stocks.We initially form 3 fractile portfolios in ascending order based independently on P/B, P/E, P/CF, P/Sales and P/D (inverse of dividend yield) ratio at the end of each June over the sample period.

Here we highlight that a number of studies conducted even in developed markets also make use of annual portfolio rebalancing. Studies by Basu (1977, 1983), Chan et al (1991), Fama and French (1992, 1998), Lakonishok et al (1994), Bauman et al (1998) and Barbee et al (1996) all make use of an annual buy and hold strategy.

We also point out the limitations in the annual buy and hold strategy in the computations of performance of portfolios used in our research as well as most other studies. We do not take delays involved in actual implementation of the portfolio into account, upon the implementation of the investment strategy e.g. we assume portfolios are implemented immediately. We also do not take trading impediments into account for the implementation of the portfolios particularly for some of the small, illiquid companies. These implementation issues involved in actual portfolio formations may have a bias in the performance of the portfolios in this study. Chapter 8 provides further details on the limitations of the thesis in terms of research design and methodology.

Consistent with a number of studies (Basu (1977), Bauman et al (1998), Capaul et al (1993), Jensen at al (1997)) we make use of Price as a ratio of accounting variables to form valuation ratios despite the probability of forming infinite ratios; say in the case of a company with low values of reported earnings thereby producing a very large P/E ratio. The use of 3 fractiles ensures that all companies whether with extreme large ratios or small ratios are sorted in their respective fractiles.

We discuss the portfolio construction process below:

a) Univariate Methodology

We make use of the univariate methodology as described in 3.4.1 1 to construct style portfolios using the Alpha Testing tool. Portfolio construction is based on forming 3 fractile portfolios in ascending order based independently on P/B, P/E, P/CF, P/Sales and P/D (inverse of dividend yield) ratio at the end of each June over the sample period. Value portfolio refers to group of stocks in the lowest fractile while growth portfolio refers to stocks in the highest fractile. Portfolios are rebalanced annually.

b) Multivariate Methodology

Due to the fact that the superiority of the value strategy may be attributable to the small-firm effect, we also construct value and growth portfolios (in this case only on portfolios sorted on P/B and P/E ratios) after neutralizing for size (market capitalisation) following the Fama and French (1992/1995) approach as described in the process above in 3.4.1.2.2 to determine size adjusted returns of value and growth portfolios. We describe our methodology below:

All firms are sorted in ascending order into 3 fractiles according to their market capitalisation as end June each year. Contrary to Fama and French we make use of three fractiles to avoid the problem of mutual exclusivity. Given the small market capitalisation nature of the markets in our study with relatively few large companies amongst a huge universe of small companies, the use of three fractiles ensure both liquidity and reasonable number of securities in each fractile. Dimson and Marsh (2001) also applied similar construction methods to sort stocks based on market capitalisation on the UK market.

Similarly as described above, at the end of each June over the sample period, 3 fractile portfolios are formed in ascending order based independently on P/B and P/E ratio. Hence, 9 size-valuation ratio portfolios are created every June of each year across the sample period from the intersection of the 3 size and 3 valuation ratio portfolios. Stocks with low market capitalization and low P/B ratio consist of the Small (Size 1)-value segment, while stocks with low market capitalization but high P/B ratio consist of the Small (Size 1)-growth segment. Portfolios are rebalanced annually at the end of June.

We present the number of companies allocated in each portfolio for every year in Appendix 3.

3.4.2.2 Data Censoring

We only make use of companies with positive valuation ratios for P/B, P/E, P/CF and available data for P/Sales and P/D ratios (P/Sales and P/D ratios are never negative) in our data set, consistent with studies such as Reiganum (1981), Basu (1983), Fama & French (1995), La Porta et al (1995), Barbee et al (1996), Levis & Liodakis (1999)).

Studies by Reiganum (1981), Basu (1983), Fama & French (1995), Barbee et al (1996), Levis & Liodakis (1999) excluded companies with negative valuation ratios. In fact, studies by Basu (1977), Cook and Rozeff (1984) and Dowen & Bauman (1986) have found that the effects of portfolio return rankings are essentially the same, whether stocks with negative EPS are included or excluded from portfolio groups.

The table 3.3 below shows the proportion of companies in Worldscope excluded from the portfolio construction based on positive P/B and P/E ratios in June 1995 as a result of data censoring. We also show the number of companies that do not have available P/Sales ratio. One would expect the number of companies excluded as a result of data censoring (companies with negative P/B, P/E values) to be more than the companies that do not have available P/Sales data. Our table below shows that the percentage of companies excluded from the portfolio construction does not differ significantly from the percentage of companies with unavailable P/Sales for all markets. It highlights that data censoring yields a set of investible companies i.e. companies with absolute sales figures which lead to positive P/Sales ratios. This gives us comfort that data censoring is unlikely to have an impact on the effects of the portfolio returns similar to studies by Basu, Cook et al and Dowen et al.

Table 3.3 -Proportion of Companies Excluded from Portfolio Construction

Countries	P/B	P/E	P/Sales
Hong Kong	35%	38%	35%
Indonesia	61%	62%	61%
Japan	4%	24%	3%
Korea	12%	19%	11%
Malaysia	28%	34%	28%
Philippines	52%	59%	52%
Singapore	38%	44%	38%
Taiwan	45%	46%	44%
Thailand	55%	58%	55%

3.4.2.3 Data Treatment

We do not perform data treatment for valuation ratios and returns of stocks in the portfolios (Market capitalisation weighted returns as discussed below helps to eliminate the impact of extreme performance of outlier stocks on the overall portfolio).This is in line with the benchmark providers and academic studies.

However, in cases where regressions are employed on the valuation ratios as in Chapter 5, we 'winzorise' the data - the bottom 5% of the values are set equal to the value corresponding to the 5th percentile while the upper 5% of the values are set equal to the value corresponding to the 95th percentile. This is to reduce the influence of extreme distortions in data. (Please refer to data treatment in Chapter 5 for further details).

3.4.2.4 Portfolio Performance Calculation

We describe the portfolio performance calculation for portfolios constructed using univariate and multivariate methodologies.

a) Univariate Methodology

In case of portfolios constructed based on the univariate methodology, stocks are weighted both equally and on market capitalisation weighted basis for both the portfolios. The equal weighted and market capitalisation weighted portfolios make use of the same fractile breakpoints. Fama and French (1992/1995) used market capitalisation weighted portfolios while most practitioners tend to use equal weighted portfolios which make us construct both equal and market capitalisation weighted portfolios. Moreover, it enables us to determine the influence of size effect on the value/growth spreads across markets. Market capitalisation weighted returns helps to eliminate the impact of extreme performance of selective stocks on the overall portfolio.

Portfolios are rebalanced at the end of each June and discrete returns are computed for each month beginning from July of each year until end of June the following year. The final rebalancing of portfolios occurs in June 2000. Both returns on an absolute and risk adjusted basis computed as returns divided by standard deviation of returns are observed. The t-statistic of the value-growth spread is observed across the sample period. The above process is replicated across each country in the study.

b) Multivariate Methodology

Similarly, in the case of portfolios constructed using multivariate methodology based on the Fama and French approach, the stocks are given equal weight as well as market capitalisation weight in the portfolios. The size adjusted return (SAAR) of value portfolio is then the simple average of the mean returns of small value, middle value and large value portfolios. Correspondingly, the size adjusted return (SAAR) of growth portfolio is the simple average of the mean returns of small growth, middle growth and large growth portfolios. Like Fama and French we also compute the style spreads between value and growth portfolios.

3.4.2.5 Survivorship/Look-ahead Bias

Worldscope reports the returns of companies as long as they remain listed on the local stock exchange ('alive'). If a company is de-listed before the next rebalancing occurs in June, its returns will be computed from the moment it is admitted to the portfolio till its de-listing. There is also no back tracking of data. As a result, we ensure there is no survivorship bias and look-ahead bias in forming portfolios in June of each year and that our tests are predictive in nature.

3.4.2.6 Descriptive Statistics of Valuation Ratios

We also show the descriptive statistics for P/B, P/E, P/CF, P/Sales and P/D in Appendix 4. However, for convenience, we only report the statistics for the valuation ratios which are used in regressions in Chapter 5. We therefore remind the readers that these ratios have been 'winzorised' and were subjected to some constraints for the purposes of becoming eligible for the regressions. For example, cross-sectional regression on P/Sales implies that our data set will only contain companies with positive P/Sales ratios, positive net profit margins, available net debt equity, beta, past 1 year earnings growth rate, past 1 year sales growth rate, IBES Consensus Mean FY1 earnings growth rate, payout ratio and historical price performance figures. We report minimum, maximum, skewness, kurtosis, normality test and number of companies for each variable across the sample time period. We make use of Jarque Bera test-statistics to determine the normality of the valuation ratios across time. The test-statistic measures the difference of the skewness and kurtosis of the valuation ratios with those from the normal distribution. The Jarque Bera statistic is distributed as -2 with 2 degrees of freedom. A small value in the reported probability leads to the rejection of null hypothesis of a normal distribution.

In most cases as observed in Appendix 4, we reject the hypothesis of a normal distribution for the valuation ratios at both the 1% and 5% level. It is interesting to note the changes in the descriptive statistics of the companies in many of these markets particularly post 1997/1998 during the Asian financial crisis. We observe a significant decrease in terms of number of securities with positive financial valuation ratios and also the magnitude of the valuation ratios.

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Appendix 1 – Table 1 - Number of companies in the universe data in each market covered by the different commonly available databases

Panel A: Hong Kong	Worldscope	S&P/Citigroup	MSCI
1990	110	54	57
1991	143	58	60
1992	153	60	61
1993	154	84	70
1994	242	138	72
1995	398	149	70
1996	457	128	73
1997	500	135	62
1998	513	188	84
1999	576	130	85
2000	815	126	78

Panel B: Indonesia	Worldscope	S&P/Citigroup	MSCI
1993	154	N/A	55
1994	199	40	61
1995	264	40	63
1996	296	40	64
1997	315	60	70
1998	321	32	67
1999	363	18	65
2000	468	21	54

Panel C: Japan	Worldscope	S&P/Citigroup	MSCI
1990	1993	1265	488
1991	2108	1357	487
1992	2139	1383	486
1993	2260	1290	486
1994	2348	1426	531
1995	2436	1486	531
1996	2501	1499	543
1997	3144	1547	540
1998	3376	1396	841
1999	3476	1040	779
2000	3561	1084	763

Panel D: Korea	Worldscope	S&P/Citigroup	MSCI
1993	199	N/A	146
1994	253	34	146
1995	272	34	147
1996	323	46	160
1997	362	45	159
1998	481	52	136
1999	696	77	126
2000	827	173	101

Chapter 3 – Data and Methodology

Appendix 1 – Table 1 cont/. - Number of companies in the universe data in each market covered by the different commonly available databases

Panel E: Malaysia	Worldscope	S&P/Citigroup	MSCI
1993	240	80	105
1994	265	116	106
1995	365	146	111
1996	417	203	111
1997	455	254	113
1998	474	287	138
1999	516	75	120
2000	740	117	121

Panel F: Philippines	Worldscope	S&P/Citigroup	MSCI
1994	112	26	66
1995	155	26	65
1996	167	32	69
1997	181	50	67
1998	200	24	66
1999	235	21	64
2000	281	23	48

Panel G: Singapore	Worldscope	S&P/Citigroup	MSCI
1990	79	34	71
1991	118	42	71
1992	135	46	71
1993	139	47	51
1994	192	59	51
1995	252	78	57
1996	261	81	64
1997	265	90	62
1998	280	91	60
1999	307	54	49
2000	446	81	60

Panel H: Taiwan	Worldscope	S&P/Citigroup	MSCI
1994	120	40	98
1995	214	40	97
1996	235	56	114
1997	242	130	114
1998	256	166	114
1999	397	172	100
2000	517	206	113

Panel I: Thailand	Worldscope	S&P/Citigroup	MSCI
1993	382	N/A	112
1994	495	75	126
1995	541	75	129
1996	588	74	129
1997	561	68	123
1998	591	28	110
1999	602	26	89
2000	747	36	65

Chapter 3 – Data and Methodology

Appendix 2 – Summary of Political/Economic Events Affecting the markets in our Sample Study

PANEL A: HONG KONG

	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
GDP growth	5.6	6.6	6.4	5.5	3.9	4.3	5.1	(5.0)	3.4	10.2	0.5
Budget balance	3.3	2.7	2.1	1.0	(0.3)	2.1	6.4	(1.8)	0.8	(0.6)	(4.9)
CPI	9.9	9.6	9.0	9.6	7.0	6.7	5.2	(1.7)	(4.0)	(2.1)	(3.5)
CA Balance							(4.5)	1.5	6.4	4.2	6.0

1994 Hong Kong saw correction in the property market as it raised interest rates following that of the US which saw Fed Funds raised from 3% to 6%.

Jan – China officially devalued the Renminbi from Rmb/US$ of 5.7 to 8.6.

Apr – The Jardine Group, one of Hong Kong's largest conglomerates de-listed from Hong Kong. This is due to concern of hostile takeover bid after 1997 changeover.

1995 Property market began to recover, as perceived risk of 1997 changeover diminished.

1996 Bubble for both stock and property markets due to capital inflows from China escaping from China austerity measures

1997 Jul – Hong Kong returned to China. The Provisional Legislative Council replaced the former Legislative Council.

Oct – Tung Chee Wah proposed the 850,000 housing plan in his first policy address. This later caused the collapse of the property market.

Dec – Outbreak of bird flu.

1998 May – Election for the first term of the Legislative Council for the Hong Kong Special Administrative Region.

Aug – Hong Kong's currency board system under attack during the Asian crisis. HK Monetary Authority intervened in stock market

1999 Jun – Introduction of the Tracker Fund from divesture of the shares accumulated by the HK Government while defending the HK currency peg.

2000 Jun – Tung Chee Wah scrapped the 850,000 housing plan project.

Appendix 2 – cont/. Summary of Political/Economic Events Affecting the markets in our Sample Study

PANEL B: INDONESIA

	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
CA Balance							(4.5)	1.5	6.4	4.2	6.0
GDP growth	6.9	6.5	6.5	7.5	8.2	7.8	4.7	(13.1)	0.8	4.9	3.8
Budget balance			0.1	0.4	0.6	0.2	(0.2)	0.7	0.2	(1.2)	(2.4)
CPI							10.3	77.5	2.0	9.4	12.6
CA balance			(1.5)	(1.7)	(3.4)	(3.4)	(2.4)	4.2	4.1	4.9	4.2

1993 Indonesia conducted elections where Suharto won with a landslide victory

1997 Asian economic crisis begins; Indonesian rupiah plummets in value.
Government signed a letter of intent with IMF to help the ailing economy.
IMF closed 11 banks which resulted in a run in the banking sector.

1998 Economic & Political Uncertainty as country adapts from autocratic regime to that of democracy.

Spiraling economic crisis and public unrest force Suharto out of office after a 32-year reign.

Vice President B.J. Habibie is sworn in as president and calls for new multiparty elections and a referendum on independence in East Timor.

Ethnic Chinese are targeted in violent riots which leave 1,000 dead and force thousands of ethnic Chinese to flee the country.

GDP growth plummets to -13%.

1999 Free Elections are held in Indonesia. President Abdurrahman Wahid (Gus Dur) becomes President.

2000 Two financial scandals break over the Wahid administration: Buloggate (involving funds embezzled from the state logistics agency), and Bruneigate (missing humanitarian aid funds from the Sultan of Brunei).

The corruption case against former President Suharto collapses.

2001 Mass political demonstrations by Wahid's supporters and opponents seen in many major cities.

IMF stops further loans citing the government's lack of progress in tackling corruption.

Parliament dismisses President Wahid over allegations of corruption and incompetence.

Vice-President Megawati Sukarnoputri is sworn in as his replacement, even as Wahid refuses to leave the presidential palace.

Appendix 2 – cont/. Summary of Political/Economic Events Affecting the markets in our Sample Study

PANEL C: JAPAN

	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
GDP growth	3.4	1.0	0.3	1.1	1.9	3.4	1.9	(1.1)	0.1	2.9	0.4
Budget balance								9.9	6.8	6.6	7.3
CPI	2.6	1.2	1.1	0.6	(0.4)	0.6	1.8	0.6	(1.1)	(0.4)	(1.2)
CA Balance	2.0	3.0	3.0	2.7	2.1	1.4	2.3	3.0	2.6	2.5	2.1

1993 Elections held against a background of bribery scandals and economic decline saw the LDP, Japan's longest serving party ousted for the first time since 1955.

Japan much needed economic reforms progress slowly as the government is led by a seven-party coalition.

1994 The seven-party coalition collapses. An administration supported by the LDP and the Socialists takes over.

1997 The Japanese economy enters a severe recession.

2001 Junichiro Koizumi becomes new LDP leader and prime minister.

Trade dispute with China after Japan imposes import tariffs on Chinese agricultural products. China retaliates with import taxes on Japanese vehicles and other manufactured goods.

Appendix 2 – cont/. Summary of Political/Economic Events Affecting the markets in our Sample Study

PANEL D: KOREA

		1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
GDP growth	9.4	5.9	6.1	8.5	9.2	7.0	4.7	-6.9	9.5	8.5	3.8	7.0
Budget balance					0.3	0.2	-1.4	-3.9	-2.5	1.1	1.2	3.3
CPI	9.3	4.5	5.8	5.6	4.8	4.9	6.6	4.0	1.4	2.8	3.2	3.7
CA Balance	-2.7	-1.2	0.2	-1.0	-1.7	-4.1	-1.6	11.7	5.5	2.4	1.7	1.0

1991	North and South Korea join the United Nations.
1993	Roh succeeded by Kim Young Sam, a former opponent of the regime and the first civilian president.
1995	Corruption and treason charges against Roh Tae-woo and Chun Doo-hwan.
1996	South Korea admitted to Organisation for Economic Cooperation and Development (OECD).
1998	Kim Dae-jung sworn in as president and pursues "sunshine policy" ; offering unconditional economic and humanitarian aid to North Korea.
2000	Summit in Pyongyang between Kim Jong-il and South Korean President Kim Dae-jung. North Korea stops propaganda broadcasts against South.

Appendix 2 – cont/. Summary of Political/Economic Events Affecting the markets in our Sample Study

PANEL E: MALAYSIA

	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
GDP growth	8.6	8.1	8.3	9.0	9.2	5.9	-1.4	-10.5	4.5	4.8	2.2
Budget balance	4.0	2.4	1.7	2.8	3.2	0.7	-1.8	-2.4	-2.4	-2.1	-2.1
CPI	4.6	3.1	4.4	4.8	7.4	4.8	7.6	4.3	0.7	1.4	0.8
CA Balance	-7.5	-5.5	-4.9	-5.4	-7.9	-7.9	-2.1	12.8	10.2	7.6	5.4

1997 Ringgitt devalued during Asian financial crisis.

Capital controls introduced.

1998 Prime Minister Mahathir Mohamad sacks his deputy and presumed successor, Anwar Ibrahim.

This is based on charges of sexual misconduct, against the background of differences between the two men over economic policy during the Asian financial crisis.

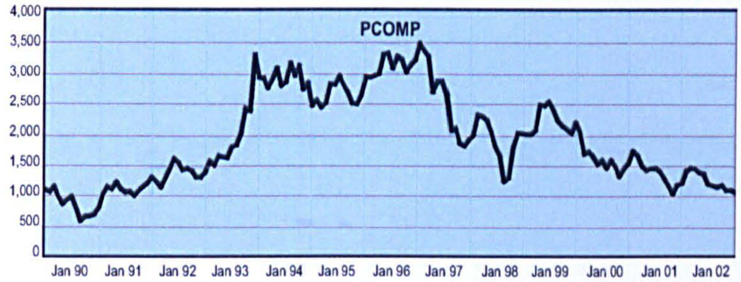
Anwar Ibrahim arrested.

2001 Mar – Dozens arrested during Malaysia's worst ethnic clashes in decades between Malays and ethnic Indians.

Sep – Malaysia and Singapore resolve long-standing disputes, ranging from water supplies to air space.
Mahathir bows out as Prime Minister.

Appendix 2 – cont/. Summary of Political/Economic Events Affecting the markets in our Sample Study

PANEL F: PHILIPPINES



	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
GDP growth	-0.6	0.3	2.1	4.4	4.7	5.9	5.2	-0.6	3.4	6.0	1.8
Budget balance	-2.1	-1.2	-1.5	1.0	0.6	0.3	0.1	-1.9	-3.8	-4.0	-4.1
CPI	13.1	8.2	8.4	7.2	11.0	7.1	7.3	10.3	4.3	6.7	4.1
CA Balance	-1.9	-1.6	-5.7	-4.3	-4.5	-4.8	-7.2	2.3	9.8	8.4	1.9

1994 Power crisis which started in 1993 was resolved under the Ramos administration ensuring better economic outlook.

1996 Economy posts higher GDP growth of 5.7% largely due to stronger investment flows with political stability.

1997 Feb – Philippine credit rating upgraded to BB+ given improving economic performance and better fiscal position.

Nov – Economy feels impact of the Asian crisis as speculative attacks on the peso weigh down on the economy and the market.

1998 Feb – Philippine credit rating suffers a downgrade.

Mar – Philippine peso falls sharply in line with general weakness in Asian currencies.

May – Philippines holds presidential elections with Estrada winning as president and Arroyo as Vice President.

1999 Consolidation in the banking sector with the merger of Bank of Philippine Islands and Far East Bank.

2000 Oct – Major scandal linking Estrada with illegal gambling forms the basis for moves to impeach Estrada.

Nov – Senate conducts impeachment hearings against Estrada.

2001 Jan – Estrada was ousted from office through people power and Arroyo assumes the presidency.

May – Another hostage-taking incident by the Abu Sayyaf.

Sep – 9/11 attacks in the US creates global concerns weighing down as well on the Philippines.

Appendix 2 – cont/. Summary of Political/Economic Events Affecting the markets in our Sample Study

PANEL G: SINGAPORE

	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
GDP growth	6.8	6.7	12.3	11.4	8.0	8.2	8.6	(0.8)	6.8	9.6	(2.0)
Budget balance	9.4	12.5	15.4	11.4	12.5	16.4	9.0	6.5	4.1	8.6	4.7
CPI	2.9	1.8	2.6	2.9	0.8	2.0	2.1	(1.4)	0.7	2.1	(0.6)
CA Balance	11.3	11.9	7.2	16.1	17.5	15.0	15.6	22.3	17.9	12.9	16.7

1990 Prime Minister Lee Kuan Yew stands down after 31 years. However, he continues to exert significant influence as senior minister.
Goh Chok Tong becomes the republic's second prime minister.

1998 Singapore slips into recession for the first time in 13 years during the Asian financial crisis.

2001 Jan – Singapore and Malaysia, its bordering neighbour improve ties as we see an agreement to end a series of long-standing disputes ranging from water supplies to air space.

Apr – General election landslide victory for governing People's Action Party which secures all but two of the 84 seats.

Sep – The government clamps down on Islamic terrorist activities with 15 suspected militants of Jemaah Islamiah arrested for alleged bomb plot.

Chapter 3 – Data and Methodology

Appendix 2 – cont/. Summary of Political/Economic Events Affecting the markets in our Sample Study

PANEL H: TAIWAN

	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
GDP growth	7.6	7.5	7.0	7.1	6.4	6.1	6.4	4.3	5.3	5.8	-2.2
Budget balance	-6.0	-3.6	-4.2	-3.7	-4.5	-5.1	-3.8	-3.4	-6.0	-4.7	-6.7
CPI	3.9	3.4	4.6	2.7	4.6	2.5	0.3	2.1	0.1	1.7	-1.7
CA Balance	6.9	4.0	3.1	2.7	2.1	3.9	2.4	1.3	2.9	2.9	6.5

1991 The ruling Kouomintang regime wins 71% of the vote in national elections and defeats the Democratic Progressive Party, which advocated Taiwan's independence.

1996 China launches what it calls "military exercises" in the ocean near Taiwan on the eve of the country's first free presidential elections.
Taiwan and the U.S. consider the exercises an act of intimidation by China.
The U.S. responds by sending a fleet of naval reinforcements to the area in what would be the biggest U.S. envoy in Asia since the Vietnam War.
Incumbent President Lee wins the election, garnering 54% of the vote.

1997 Hong Kong, a former British colony, is reverted to Chinese rule.

1999 Macau, a former Portuguese territory on the Chinese coast is reverted to Chinese rule.

2000 Mar – Taiwan holds its second free presidential elections in history.
Voters elect pro-independence candidate Chen Shui-bian of the Democratic Progressive Party ending more than 50 years of Nationalist rule of Taiwan.

2001 Apr – President George W. Bush approves the largest package of arms sales to Taiwan in nearly a decade.

Oct – China chooses not to invite Taiwan to the Asia-Pacific Economic Cooperation (APEC) meeting in Shanghai.

Nov – Taiwan eases restrictions for business that wish to invest in companies on mainland China.
Although many businesses had already found loopholes in these 50-year-old policies, economists hope that the rollback will boost Taiwan's slumping economy and speed up the integration of the economies of Taiwan and China, which are expected to join the World Trade Organization later this month.

Nov – Representatives of the World Trade Organization make Taiwan an official member at a meeting in Doha, Qatar, one day after China is unanimously admitted.

Dec – Parliamentary elections are held in Taiwan.
The Democratic Progressive Party (DPP) wins enough seats to replace the Kuomintang (KMT) as the largest party in Taiwan's legislature.
KMT nationalists had controlled the legislature since it fled from mainland China to the island in 1949.

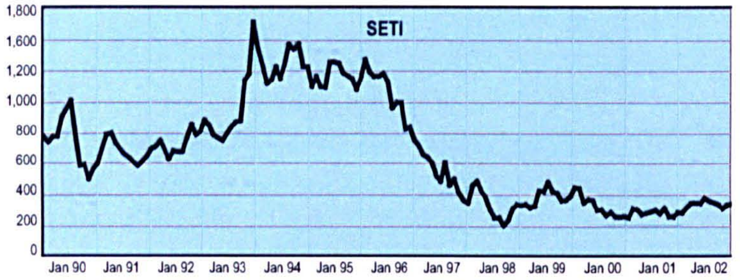
2004 Mar – President Chen Sui-bian and Vice President Annette Lu survive an assassination attempt the day before presidential elections and voting on two controversial referendums.
The elections pit incumbent Chen, a strong advocate of a more independent relationship with mainland China, against Lien Chan, whose stance is far more conciliatory.
Chen very narrowly won the election over Lien Chan, who demanded a recount.
The referendum failed due to low response

May – Election officials announce the recount has been completed in favour of Chen.

Chapter 3 – Data and Methodology

Appendix 2 – cont/. Summary of Political/Economic Events Affecting the markets in our Sample Study

PANEL I: THAILAND



	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
GDP growth	8.6	8.1	8.3	9.0	9.2	5.9	(1.4)	(10.5)	4.5	4.8	2.2
Budget balance	4.0	2.4	1.7	2.8	3.2	0.7	(1.8)	(2.4)	(2.4)	(2.1)	(2.1)
CPI	4.6	3.1	4.4	4.8	7.4	4.8	7.6	4.3	0.7	1.4	0.8
CA Balance	(7.5)	(5.5)	(4.9)	(5.4)	(7.9)	(7.9)	(2.1)	12.8	10.2	7.6	5.4

1997 Jul – Baht devaluation during Asian financial crisis. Start of long economic crisis in Thailand

Nov – PM Chawalit resigns & cabinet dissolved. Democratic Party takes the lead in the Elections led by Chuan Leekpai.
Moody's downgraded Thailand sovereign debt from Baa1 to Baa3 as well as several banks debt

Dec – Major banks announce further hikes in interest rate as benchmark deposit rates rise to 12.75%.
56 of 58 suspended finance companies permanently closed.
Moody's puts junk label on Thai debt from Baa3 to Ba1.
24 finance companies delisted.
PM Chuan demanded that the big banks increase capital - to enable lending activities and ease liquidity to spur domestic economic growth.

1998 Jan – Capital raising by most major banks.

Mar – Government won no confidence debate 208:177

May – S&P downgrades ratings of Thai financial institutions to BBB-

Aug – MoF's stimulus package US$5bn

Sep – Moody's upgrades local baht bond rating to Baa1 from Baa3
Thai banks continue to reduce deposit and lending rate
Moody's downgrades 6 banks from Ba1 to Ba3 - long term debt rating
S&P downgrades ratings of 3 Thai banks - long term currency ratings

Dec – Non-performing loans of banking system worth 40.5% with local banks accounting for more than 46%.

1999 Mar – Bankruptcy court bill passed in Senate to pave way for foreclosure of loans and removal of NPLs in the system.
Baht 130bn government stimulus package to steer the economy to recovery post the Asian crisis.

2001 General Election takes place won by PM Thaksin Shinawattra from Thai Rak Thai Party

Appendix 3 – Table 1 - Number of stocks per portfolio based on the Intersection between P/B and Size

Panel A: Hong Kong

	SMALL-CAP			MID-CAP			LARGE-CAP		
	Value	Middle	Growth	Value	Middle	Growth	Value	Middle	Growth
1990	9	15	9	14	9	11	10	10	14
1991	14	15	7	15	12	10	8	11	17
1992	20	17	8	17	14	15	8	17	21
1993	19	19	11	19	17	13	11	14	24
1994	22	21	8	21	16	15	10	14	28
1995	34	30	18	29	30	23	20	22	40
1996	60	50	20	50	36	45	22	42	66
1997	57	60	28	53	50	43	37	33	76
1998	78	46	24	51	51	47	23	54	72
1999	74	51	21	57	47	43	19	48	79
2000	71	50	20	53	49	40	22	44	75

Panel B: Indonesia

	SMALL-CAP			MID-CAP			LARGE-CAP		
	Value	Middle	Growth	Value	Middle	Growth	Value	Middle	Growth
1993	18	8	1	6	9	12	3	10	14
1994	21	8	2	8	12	12	2	12	18
1995	22	8	4	8	22	5	4	5	26
1996	29	12	3	12	18	15	3	15	26
1997	34	13	4	12	24	16	4	15	32
1998	24	16	8	18	20	11	6	12	30
1999	20	13	5	12	18	9	6	8	25
2000	18	16	6	14	14	12	6	11	23

Panel C: Japan

	SMALL-CAP			MID-CAP			LARGE-CAP		
	Value	Middle	Growth	Value	Middle	Growth	Value	Middle	Growth
1990	166	167	217	169	211	165	209	173	162
1991	233	198	230	216	225	221	212	239	210
1992	293	189	212	229	227	239	173	278	243
1993	292	198	231	239	242	240	190	282	249
1994	286	211	249	264	233	250	197	302	247
1995	316	213	243	305	240	228	154	321	298
1996	335	211	243	283	249	257	170	329	290
1997	373	211	216	316	275	210	115	314	372
1998	409	225	173	316	312	180	88	276	443
1999	418	216	168	308	301	194	81	289	432
2000	431	224	138	294	326	174	69	247	477

Panel D: Korea

	SMALL-CAP			MID-CAP			LARGE-CAP		
	Value	Middle	Growth	Value	Middle	Growth	Value	Middle	Growth
1993	16	13	15	15	12	18	13	21	11
1994	24	25	19	27	20	22	16	25	27
1995	21	35	22	34	19	26	23	26	30
1996	29	30	28	31	25	32	27	33	28
1997	36	36	28	33	21	46	30	44	26
1998	53	31	12	32	35	30	12	32	53
1999	45	28	18	29	35	28	17	27	47
2000	49	27	14	24	46	21	16	19	55

Chapter 3 – Data and Methodology

Appendix 3 – Table 1 cont/. - Number of stocks per portfolio based on the Intersection between P/B and Size

Panel E: Malaysia

	SMALL-CAP			MID-CAP			LARGE-CAP		
	Value	Middle	Growth	Value	Middle	Growth	Value	Middle	Growth
1993	26	30	20	29	26	22	21	21	35
1994	29	25	23	27	30	20	21	22	34
1995	30	25	32	36	33	18	21	29	37
1996	28	38	58	61	40	24	35	46	43
1997	38	40	64	61	52	30	43	50	49
1998	57	48	38	66	54	24	21	42	81
1999	49	47	39	61	53	22	25	37	74
2000	46	43	41	53	56	22	31	33	67

Panel F: Philippines

	SMALL-CAP			MID-CAP			LARGE-CAP		
	Value	Middle	Growth	Value	Middle	Growth	Value	Middle	Growth
1994	14	3	3	6	10	5	0	8	12
1995	16	5	2	8	10	6	0	8	16
1996	23	10	1	11	12	11	0	11	23
1997	28	10	1	10	19	10	1	10	28
1998	27	9	3	9	20	11	3	11	25
1999	23	12	3	15	16	8	1	11	27
2000	23	9	5	12	17	9	2	12	23

Panel G: Singapore

	SMALL-CAP			MID-CAP			LARGE-CAP		
	Value	Middle	Growth	Value	Middle	Growth	Value	Middle	Growth
1990	8	6	4	9	5	5	2	7	9
1991	10	8	2	8	10	3	3	4	14
1992	12	19	3	15	10	9	7	6	21
1993	17	14	5	14	11	12	6	13	18
1994	15	14	9	13	10	15	10	15	13
1995	21	17	13	21	14	17	9	21	21
1996	28	27	18	26	19	28	19	28	26
1997	25	31	20	30	19	27	21	27	28
1998	31	33	13	29	24	24	17	21	39
1999	23	28	24	29	22	25	24	25	26
2000	31	28	12	27	23	22	14	23	34

Panel H: Taiwan

	SMALL-CAP			MID-CAP			LARGE-CAP		
	Value	Middle	Growth	Value	Middle	Growth	Value	Middle	Growth
1994	8	7	2	7	7	4	2	5	10
1995	19	11	9	10	18	11	9	11	19
1996	37	19	16	22	30	20	13	24	35
1997	41	23	14	25	27	27	12	29	38
1998	39	24	16	23	30	27	17	26	36
1999	48	26	4	24	27	28	6	26	46
2000	47	28	3	26	28	24	5	22	51

Chapter 3 – Data and Methodology

Appendix 3 – Table 1 cont/. - Number of stocks per portfolio based on the Intersection between P/B and Size

Panel I: Thailand	SMALL-CAP			MID-CAP			LARGE-CAP		
	Value	Middle	Growth	Value	Middle	Growth	Value	Middle	Growth
1993	21	11	5	10	10	18	7	16	15
1994	41	23	9	22	28	23	10	22	41
1995	47	28	6	29	36	17	5	18	58
1996	60	20	6	23	43	20	3	23	60
1997	58	29	5	32	33	28	2	31	59
1998	49	23	9	20	36	26	13	23	46
1999	48	23	9	26	36	19	6	22	53
2000	41	19	12	19	31	23	6	26	41

Appendix 3 – Table 2 - Number of stocks per portfolio based on the Intersection between P/E and Size

Panel A: Hong Kong	SMALL-CAP			MID-CAP			LARGE-CAP		
	Value	Middle	Growth	Value	Middle	Growth	Value	Middle	Growth
1990	14	8	9	10	12	10	7	12	12
1991	15	6	12	10	17	6	9	10	14
1992	23	8	12	14	15	12	7	17	19
1993	24	12	10	12	18	17	11	16	19
1994	26	11	13	17	19	14	7	21	22
1995	36	23	19	33	27	18	11	28	39
1996	59	25	25	41	37	32	11	47	52
1997	62	30	32	42	47	36	21	46	58
1998	60	30	25	40	43	32	19	42	54
1999	40	25	20	35	27	24	11	31	44
2000	60	26	19	30	37	39	18	41	47

Panel B: Indonesia	SMALL-CAP			MID-CAP			LARGE-CAP		
	Value	Middle	Growth	Value	Middle	Growth	Value	Middle	Growth
1993	16	8	5	7	10	10	4	11	12
1994	20	9	1	9	11	11	1	11	19
1995	20	9	4	11	14	9	2	11	21
1996	27	11	5	12	20	12	3	13	26
1997	26	10	12	16	20	13	6	19	24
1998	14	10	3	11	9	8	2	9	16
1999	13	3	3	6	7	7	0	10	9
2000	18	12	6	10	14	12	6	11	19

Panel C: Japan	SMALL-CAP			MID-CAP			LARGE-CAP		
	Value	Middle	Growth	Value	Middle	Growth	Value	Middle	Growth
1990	149	173	207	166	184	180	214	173	143
1991	225	172	233	188	230	212	216	229	185
1992	272	159	193	190	214	221	162	252	211
1993	227	160	193	186	204	191	166	217	197
1994	212	175	195	199	199	185	171	208	204
1995	247	173	192	210	201	201	154	239	219
1996	249	181	222	225	214	213	178	256	218
1997	293	176	215	238	227	219	153	282	249
1998	299	149	178	240	195	191	89	285	252
1999	249	134	149	193	173	166	90	227	215
2000	289	164	139	227	199	167	78	233	282

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Appendix 3 – Table 2 cont/. - Number of stocks per portfolio based on the Intersection between P/E and Size

Panel D: Korea

	SMALL-CAP			MID-CAP			LARGE-CAP		
	Value	Middle	Growth	Value	Middle	Growth	Value	Middle	Growth
1993	15	10	12	13	14	11	10	14	14
1994	16	21	21	22	20	16	19	18	21
1995	22	27	23	24	24	25	27	21	24
1996	26	22	22	22	23	25	22	26	22
1997	31	16	21	18	28	23	20	25	24
1998	30	12	10	17	22	14	6	20	27
1999	23	21	10	19	15	21	13	18	23
2000	28	19	24	27	28	17	17	25	29

Panel E: Malaysia

	SMALL-CAP			MID-CAP			LARGE-CAP		
	Value	Middle	Growth	Value	Middle	Growth	Value	Middle	Growth
1993	31	21	19	24	21	27	16	30	26
1994	30	17	23	22	27	22	18	27	26
1995	29	19	31	29	26	25	22	34	24
1996	31	27	55	45	34	34	37	51	25
1997	29	42	53	50	38	36	45	45	34
1998	38	30	28	38	31	28	21	36	40
1999	25	22	28	30	28	18	21	26	29
2000	32	29	31	40	24	29	21	40	31

Panel F: Philippines

	SMALL-CAP			MID-CAP			LARGE-CAP		
	Value	Middle	Growth	Value	Middle	Growth	Value	Middle	Growth
1994	7	4	6	8	4	6	2	10	5
1995	6	9	5	7	5	8	6	6	8
1996	18	5	7	11	10	9	1	14	15
1997	12	7	14	15	11	7	6	15	12
1998	11	9	8	14	8	7	3	12	14
1999	14	2	7	5	10	9	4	11	8
2000	11	7	5	8	6	9	4	10	9

Panel G: Singapore

	SMALL-CAP			MID-CAP			LARGE-CAP		
	Value	Middle	Growth	Value	Middle	Growth	Value	Middle	Growth
1990	6	5	7	8	8	3	4	5	9
1991	4	8	7	8	6	5	6	6	7
1992	14	8	9	12	9	11	6	15	10
1993	14	7	12	12	13	9	7	14	12
1994	11	11	11	14	10	10	9	13	12
1995	19	17	10	15	18	14	12	12	23
1996	24	21	19	22	23	20	18	21	26
1997	23	19	25	25	20	22	19	28	20
1998	27	18	17	23	18	21	12	26	24
1999	18	13	17	17	16	14	14	19	16
2000	26	21	12	20	19	21	15	20	25

Chapter 3 – Data and Methodology

Appendix 3 – Table 2 cont/. - Number of stocks per portfolio based on the Intersection between P/E and Size

Panel H: Taiwan	SMALL-CAP			MID-CAP			LARGE-CAP		
	Value	Middle	Growth	Value	Middle	Growth	Value	Middle	Growth
1994	5	5	5	4	5	7	7	5	4
1995	10	16	12	14	11	14	14	11	13
1996	19	21	24	27	18	20	18	25	21
1997	23	21	25	25	22	22	21	26	22
1998	18	22	32	24	23	25	30	27	15
1999	26	18	10	12	17	26	16	20	19
2000	24	15	19	19	20	19	15	23	20

Panel I: Thailand	SMALL-CAP			MID-CAP			LARGE-CAP		
	Value	Middle	Growth	Value	Middle	Growth	Value	Middle	Growth
1993	14	9	13	10	15	12	12	12	12
1994	29	21	15	19	28	19	17	17	32
1995	38	18	19	32	31	13	5	27	43
1996	43	20	16	31	25	23	5	34	40
1997	41	17	18	23	33	21	12	27	37
1998	22	15	12	16	20	13	11	14	24
1999	22	17	15	20	22	13	11	16	27
2000	17	13	12	15	11	16	6	18	18

Chapter 3 – Data and Methodology

Appendix 4 – Table 1 – Descriptive Statistics

Panel A: Hong Kong

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
P/B											
Max	5.31	4.19	5.61	7.21	4.69	3.89	4.69	6.18	3.28	3.87	8.84
Min	0.54	0.47	0.66	0.61	0.42	0.33	0.31	0.41	0.14	0.16	0.10
μ	1.61	1.36	1.88	2.10	1.64	1.27	1.36	1.57	0.76	1.10	1.20
σ	1.30	1.04	1.40	1.80	1.21	1.02	1.07	1.36	0.81	1.01	1.61
Skewness	1.74	1.46	1.50	1.65	1.21	1.35	1.29	1.62	1.90	1.62	3.14
Kurtosis	5.36	4.06	4.07	4.05	3.45	3.78	3.89	5.18	5.74	4.63	14.23
Jarque Bera	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
No of companies	55	58	68	80	88	105	149	207	204	150	138
P/E											
Max	26.6	51.20	84.94	86.15	32.18	32.94	71.18	152.17	50.61	50.26	87.57
Min	2.60	2.80	3.32	2.49	3.39	3.43	3.60	3.63	2.10	2.56	3.00
μ	12.22	12.21	20.88	20.65	16.21	13.52	16.58	19.51	10.08	11.78	14.18
σ	6.09	11.33	19.02	18.50	7.95	8.05	17.63	27.47	12.81	19.07	17.35
Skewness	0.56	1.39	2.48	2.49	0.61	0.91	1.68	3.35	1.57	0.01	2.28
Kurtosis	4.00	7.37	8.52	8.87	2.41	3.66	6.48	15.87	5.97	2.86	9.92
Jarque Bera	0.02	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.97	0.00
No of companies	55	58	68	80	88	105	149	207	204	150	138
P/Sales											
Max	9.59	7.70	12.30	11.71	13.25	10.64	12.10	16.14	7.05	10.91	20.93
Min	0.43	0.42	0.34	0.39	0.32	0.24	0.20	0.25	0.08	0.11	0.12
μ	3.43	2.91	4.19	4.19	4.87	3.81	3.96	4.44	1.87	3.21	3.74
σ	2.67	2.33	3.72	3.27	4.04	3.20	3.60	4.00	1.87	3.23	5.14
Skewness	0.98	0.75	0.97	0.85	0.78	0.79	0.94	1.27	1.46	1.22	2.18
Kurtosis	2.94	2.21	2.68	2.80	2.44	2.54	2.82	4.37	4.40	3.43	7.07
Jarque Bera	0.00	0.01	0.00	0.01	0.02	0.02	0.00	0.00	0.00	0.00	0.00
No of companies	55	58	68	80	88	105	149	207	205	151	139
P/D											
Max	54.85	43.76	86.65	92.15	131.00	93.55	129.42	174.20	99.70	219.48	241.21
Min	9.96	9.77	7.93	12.10	10.45	7.51	9.24	11.94	4.29	7.02	5.35
μ	24.14	21.92	30.62	32.73	38.56	30.18	32.64	38.16	15.83	38.94	43.41
σ	12.75	10.53	18.68	20.30	27.71	20.84	24.67	28.82	13.81	38.79	52.03
Skewness	1.03	0.79	1.39	1.42	2.01	1.66	2.23	2.31	3.90	2.62	2.52
Kurtosis	3.15	2.36	4.58	4.23	7.06	5.51	8.72	9.83	23.18	10.84	9.22
Jarque Bera	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
No of companies	55	59	69	81	87	105	150	204	202	144	128

Notes for Table 1

We report the maximum, minimum, mean (μ), standard deviation (σ), skewness, kurtosis, and Jarque Bera reported probability and number of companies for the above valuation ratios. The valuation ratios are ratios have been 'winzorised' for the purposes of regressions conducted in Chapter 5 later in the thesis.

Appendix 4 – Table 1 cont/. – Descriptive Statistics

Panel B: Indonesia	1993	1994	1995	1996	1997	1998	1999	2000
P/B								
Max	7.96	6.22	6.49	4.78	5.15	5.36	8.66	6.62
Min	0.57	0.67	0.40	0.39	0.51	0.07	0.60	0.52
μ	2.53	2.50	1.81	1.63	2.06	0.88	1.79	1.78
σ	2.01	1.55	1.69	1.30	1.37	1.29	2.45	2.12
Skewness	1.48	0.88	1.74	1.05	0.96	2.78	1.68	1.19
Kurtosis	4.38	3.04	5.16	2.99	2.95	9.72	5.28	3.21
Jarque Bera	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00
No of companies	48	61	61	64	84	26	26	36
P/E								
Max	48.75	43.76	87.96	51.37	88.77	42.09	35.60	78.50
Min	4.89	5.52	3.71	3.48	3.96	4.50	3.89	4.55
μ	19.57	20.32	22.01	15.89	22.87	7.04	0.98	9.50
σ	12.99	10.52	23.51	13.12	22.04	14.14	11.98	18.85
Skewness	1.03	0.53	2.01	1.58	2.18	1.42	1.10	2.47
Kurtosis	3.01	2.37	6.07	4.71	6.73	4.22	5.75	9.03
Jarque Bera	0.01	0.18	0.00	0.00	0.00	0.00	0.00	0.00
No of companies	48	61	60	64	83	41	26	36
P/Sales								
Max	6.14	8.84	6.14	7.12	7.68	6.17	8.56	7.45
Min	0.46	0.43	0.29	0.17	0.25	0.05	0.13	0.09
μ	2.46	2.85	2.01	1.78	2.15	0.92	1.45	1.52
σ	1.68	2.33	1.87	1.87	1.97	1.52	2.12	2.00
Skewness	0.92	1.39	1.23	1.81	1.71	2.56	2.36	1.92
Kurtosis	2.96	4.17	2.83	5.53	5.41	8.65	7.86	5.60
Jarque Bera	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00
No of companies	48	61	60	64	83	41	26	36
P/D								
Max	120.00	120.00	67.20	122.84	137.48	36.00	145.0	150.0
Min	10.47	11.08	9.20	7.40	13.10	3.56	13.67	9.17
μ	32.75	37.23	29.33	33.77	30.39	15.35	40.23	38.56
σ	31.64	37.43	21.13	44.74	36.56	11.98	35.42	37.98
Skewness	2.10	1.48	0.74	1.53	2.58	0.70	2.51	1.38
Kurtosis	6.46	3.60	2.14	3.50	8.13	1.88	7.76	3.11
Jarque Bera	0.00	0.12	0.51	0.11	0.00	0.48	0.00	0.18
No of companies	46	59	60	64	81	43	19	23

Notes for Table 1

We report the maximum, minimum, mean (μ), standard deviation (σ), skewness, kurtosis, and Jarque Bera reported probability and number of companies for the above valuation ratios. The valuation ratios are ratios have been 'winzorised' for the purposes of regressions conducted in Chapter 5 later in the thesis.

Chapter 3 – Data and Methodology

Appendix 4 – Table 1 cont/. – Descriptive Statistics

Panel C: Japan	**1990**	**1991**	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**
P/B											
Max	11.87	8.04	4.65	5.62	6.08	4.06	6.17	4.32	3.29	5.71	6.08
Min	2.06	1.37	0.83	1.07	1.13	0.71	1.02	0.67	0.35	0.40	0.31
μ	4.68	3.17	1.96	2.39	2.48	1.61	2.40	1.81	1.25	1.50	1.49
σ	2.58	1.67	0.98	1.16	1.22	0.80	1.24	0.94	0.75	1.16	1.35
Skewness	1.49	1.49	1.27	1.31	1.49	1.54	1.59	1.22	1.21	2.05	2.02
Kurtosis	4.51	4.69	3.97	4.08	4.77	5.05	5.14	3.87	3.90	7.25	6.81
Jarque Bera	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
No of companies	446	466	568	513	482	807	849	1433	1398	1593	1695
P/E											
Max	221.15	166.20	137.46	227.00	295.00	178.56	252.65	152.00	116.13	157.21	126.84
Min	21.65	4.96	4.53	4.87	4.98	4.35	5.21	3.98	3.52	3.11	3.03
μ	71.25	51.14	37.64	50.13	57.00	37.18	55.21	34.91	27.63	25.62	27.29
σ	50.09	37.53	35.50	68.90	90.71	56.27	74.10	44.20	36.83	49.02	38.88
Skewness	1.75	1.74	1.26	0.85	0.88	0.78	1.11	0.87	0.82	0.93	1.04
Kurtosis	5.44	5.66	4.76	4.09	4.05	3.95	4.34	3.87	3.49	3.88	3.70
Jarque Bera	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
No of companies	446	466	568	513	482	807	849	1434	1398	1595	1700
P/Sales											
Max	5.01	3.35	2.32	2.95	3.32	2.17	3.12	2.55	1.86	2.75	3.40
Min	0.43	0.28	0.17	0.23	0.24	0.16	0.22	0.14	0.08	0.10	0.08
μ	1.79	1.20	0.78	1.01	1.15	0.72	1.05	0.81	0.57	0.68	0.69
σ	1.19	0.79	0.55	0.71	0.80	0.53	0.75	0.65	0.50	0.65	0.77
Skewness	1.27	1.25	1.35	1.29	1.37	1.36	1.35	1.37	1.40	1.80	2.03
Kurtosis	4.05	4.00	4.27	4.03	4.26	4.14	4.22	4.04	3.99	5.69	6.74
Jarque Bera	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
No of companies	446	466	568	513	482	807	849	1434	1398	1595	1699
P/D											
Max	702.47	518.94	294.42	303.23	343.39	249.15	370.80	289.48	207.54	318.60	724.64
Min	115.67	77.77	50.49	68.77	76.06	49.98	75.99	50.67	27.40	34.14	27.80
μ	264.79	185.9	117.17	136.77	150.31	104.98	148.26	123.92	88.38	102.55	127.75
σ	153.35	109.38	60.40	58.49	63.58	46.98	62.91	61.54	49.73	66.73	138.25
Skewness	1.63	1.67	1.42	1.26	1.24	1.33	1.56	1.13	0.99	1.58	2.86
Kurtosis	4.95	5.32	4.52	4.07	4.09	4.48	5.66	3.63	3.14	5.28	11.69
Jarque Bera	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
No of companies	431	457	558	506	472	791	818	1363	1338	1545	1622

Notes for Table 1

We report the maximum, minimum, mean (m), standard deviation (s), skewness, kurtosis, and Jarque Bera reported probability and number of companies for the above valuation ratios. The valuation ratios are ratios have been 'winzorised' for the purposes of regressions conducted in Chapter 5 later in the thesis.

Chapter 3 – Data and Methodology

Appendix 4 – Table 1 cont/. – Descriptive Statistics

Panel D: Korea	1993	1994	1995	1996	1997	1998	1999	2000
P/B								
Max	2.61	2.67	2.92	2.49	3.16	1.74	3.33	2.24
Min	0.38	0.50	0.45	0.40	0.22	0.18	0.20	0.32
μ	1.22	1.37	1.23	0.99	0.92	0.33	0.88	0.45
σ	0.53	0.61	0.63	0.52	0.64	0.41	0.83	0.47
Skewness	0.81	0.73	1.22	1.37	1.73	1.89	1.34	1.78
Kurtosis	3.56	2.72	4.05	4.47	5.94	6.64	4.39	6.90
Jarque Bera	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
No of companies	68	101	171	164	151	117	112	188
P/E								
Max	110.37	109.54	100.37	114.76	134.06	33.26	86.36	35.39
Min	2.56	2.47	2.45	2.59	2.85	1.89	2.31	2.28
μ	38.33	39.21	38.45	41.24	51.23	14.54	30.45	15.27
σ	30.18	31.56	22.50	25.94	36.66	10.75	25.10	6.66
Skewness	1.37	0.98	1.70	1.55	1.86	1.13	1.49	2.68
Kurtosis	4.55	4.08	6.14	6.48	6.40	3.69	4.88	11.87
Jarque Bera	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
No of companies	68	101	171	164	151	118	112	188
P/Sales								
Max	3.80	3.14	1.98	3.36	1.96	1.00	2.39	1.72
Min	0.08	0.10	0.10	0.08	0.07	0.01	0.02	0.01
μ	0.71	0.71	0.56	0.58	0.39	0.14	0.44	0.28
σ	0.96	0.77	0.53	0.84	0.46	0.22	0.59	0.39
Skewness	2.44	2.14	1.79	2.63	2.45	2.61	2.16	2.59
Kurtosis	7.83	6.66	5.08	8.59	8.05	9.63	6.98	9.34
Jarque Bera	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
No of companies	69	104	172	160	147	116	113	185
P/D								
Max	309.10	384.51	522.00	552.07	409.84	374.58	800.23	754.23
Min	30.89	32.18	28.25	25.88	18.90	4.07	29.82	12.53
μ	91.38	132.38	123.47	139.89	130.77	125.67	311.43	375.67
σ	79.62	118.58	117.99	152.04	127.80	71.00	100.53	135.23
Skewness	1.45	1.39	2.00	1.85	1.42	3.83	3.34	2.54
Kurtosis	3.79	3.43	6.56	5.24	3.54	7.98	6.35	3.85
Jarque Bera	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
No of companies	57	91	152	149	139	110	104	142

Notes for Table 1

We report the maximum, minimum, mean (μ), standard deviation (σ), skewness, kurtosis, and Jarque Bera reported probability and number of companies for the above valuation ratios. The valuation ratios are ratios have been 'winzorised' for the purposes of regressions conducted in Chapter 5 later in the thesis.

Chapter 3 – Data and Methodology

Appendix 4 – Table 1 cont/. – Descriptive Statistics

Panel E: Malaysia	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**
P/B								
Max	7.69	8.46	7.32	9.89	8.96	2.42	5.13	5.63
Min	0.94	1.24	1.26	1.26	1.01	0.16	0.29	0.28
μ	2.87	3.51	3.29	3.25	2.69	0.75	1.70	1.56
σ	1.81	1.98	1.64	1.64	1.87	0.61	1.28	1.33
Skewness	1.27	1.12	0.90	0.90	1.81	1.47	1.39	1.74
Kurtosis	3.97	3.42	3.00	3.00	5.96	4.41	4.06	5.51
Jarque Bera	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
No of companies	122	129	148	163	204	171	110	107
P/E								
Max	82.94	120.24	103.63	200.49	165.67	45.38	113.91	89.54
Min	1.25	3.02	2.27	2.29	1.87	1.02	1.30	1.26
μ	26.57	34.27	30.49	38.05	31.71	7.42	13.58	11.98
σ	19.37	32.67	28.76	46.94	41.49	14.23	35.92	26.05
Skewness	1.38	0.69	0.41	2.54	1.98	0.91	1.40	1.13
Kurtosis	5.08	4.71	4.78	9.50	7.21	3.99	4.89	4.99
Jarque Bera	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
No of companies	122	129	148	163	203	171	110	107
P/Sales								
Max	15.17	37.59	31.81	25.33	14.74	4.10	10.43	10.06
Min	0.61	0.72	0.71	0.73	0.74	0.12	0.35	0.33
μ	3.99	6.45	5.52	5.29	3.82	1.16	2.82	2.76
σ	3.93	8.70	7.21	6.01	3.53	1.16	2.91	2.68
Skewness	1.69	2.52	2.52	2.41	2.06	1.39	1.63	1.44
Kurtosis	4.98	8.88	9.80	8.13	6.79	3.88	4.53	4.14
Jarque Bera	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
No of companies	122	129	148	163	203	171	110	107
P/D								
Max	356.86	463.49	611.92	474.23	523.81	131.10	521.20	746.14
Min	21.62	30.0	32.28	30.41	30.36	8.69	22.18	16.92
μ	88.52	110.73	106.10	111.13	90.06	31.45	108.11	123.79
σ	82.69	92.16	95.34	92.34	87.57	26.62	113.49	168.44
Skewness	1.96	1.94	3.04	2.26	3.16	2.05	1.89	2.56
Kurtosis	6.31	7.01	14.62	8.64	14.14	7.22	6.02	9.16
Jarque Bera	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
No of companies	119	130	60	160	198	171	105	99

Notes for Table 1

We report the maximum, minimum, mean (μ), standard deviation (σ), skewness, kurtosis, and Jarque Bera reported probability and number of companies for the above valuation ratios. The valuation ratios are ratios have been 'winzorised' for the purposes of regressions conducted in Chapter 5 later in the thesis.

Appendix 4 – Table 1 cont/. – Descriptive Statistics

Panel F: Philippines	1994	1995	1996	1997	1998	1999	2000
P/B							
Max	8.21	6.50	8.96	4.74	3.02	3.92	2.57
Min	0.28	0.44	0.54	0.50	0.15	0.17	0.16
μ	2.93	2.28	2.20	1.67	0.94	1.22	0.88
σ	2.21	1.65	1.82	1.22	0.81	0.98	0.65
Skewness	1.29	1.27	2.30	1.43	1.37	1.34	1.19
Kurtosis	3.75	3.68	8.44	3.84	3.90	3.71	3.68
Jarque Bera	0.00	0.00	0.00	0.00	0.00	0.00	0.00
No of companies	23	34	42	60	57	42	37
P/E							
Max	82.45	61.60	110.11	91.20	37.75	59.74	71.18
Min	2.35	2.01	2.65	2.59	1.93	2.05	2.29
μ	33.76	22.96	25.83	23.53	13.05	14.69	14.78
σ	25.27	18.75	29.06	27.98	12.10	23.76	21.33
Skewness	0.59	0.73	1.70	1.35	0.61	0.47	1.07
Kurtosis	2.11	2.91	5.77	4.00	2.52	2.58	3.60
Jarque Bera	0.15	0.16	0.00	0.00	0.23	0.40	0.01
No of companies	23	34	42	60	57	42	37
P/Sales							
Max	19.64	26.16	25.26	20.73	7.85	30.73	28.02
Min	0.68	0.80	0.56	0.26	0.16	0.21	0.15
μ	6.62	6.87	6.89	5.06	2.24	5.34	4.94
σ	6.05	7.80	7.55	6.01	2.28	8.73	8.16
Skewness	1.02	1.51	1.28	1.75	1.35	2.23	2.12
Kurtosis	2.73	3.99	3.34	4.90	3.79	6.58	6.07
Jarque Bera	0.02	0.00	0.00	0.00	0.00	0.00	0.00
No of companies	23	34	42	60	57	42	37
P/D							
Max	1544.71	1676.23	1900.57	1626.31	1780.89	1807.26	1857.48
Min	30.00	33.00	38.75	20.62	17.29	13.10	10.01
μ	507.96	655.23	875.35	576.46	713.37	725.30	766.58
σ	500.21	603.25	823.49	513.24	698.26	711.15	726.79
Skewness	1.18	2.83	2.83	1.65	1.62	2.85	2.78
Kurtosis	3.88	9.03	9.06	3.72	3.79	9.10	8.87
Jarque Bera	0.23	0.00	0.00	0.07	0.08	0.00	0.00
No of companies	17	22	28	37	34	22	23

Notes for Table 1

We report the maximum, minimum, mean (μ), standard deviation (σ), skewness, kurtosis, and Jarque Bera reported probability and number of companies for the above valuation ratios. The valuation ratios are ratios have been 'winzorised' for the purposes of regressions conducted in Chapter 5 later in the thesis.

Appendix 4 – Table 1 cont/. – Descriptive Statistics

Panel G: Singapore	**1990**	**1991**	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**
P/B											
Max	2.96	2.93	3.13	4.54	3.97	3.76	4.04	4.17	2.02	4.36	2.44
Min	0.88	0.63	0.61	0.59	0.64	0.64	0.70	0.58	0.22	0.63	0.38
μ	1.72	1.46	1.40	1.49	1.72	1.47	1.47	1.23	0.55	1.43	0.97
σ	0.64	0.66	0.64	0.76	0.78	0.67	0.78	0.69	0.39	0.88	0.53
Skewness	0.35	0.69	0.75	1.50	0.78	1.20	1.45	2.15	1.82	1.69	1.30
Kurtosis	1.98	2.58	2.74	6.65	3.21	4.62	4.72	8.92	6.27	5.77	4.03
Jarque Bera	0.22	0.13	0.11	0.00	0.00	0.09	0.00	0.00	0.00	0.00	0.00
No of companies	38	45	49	66	73	80	111	145	131	84	101
P/E											
Max	107.99	89.90	178.73	143.36	112.51	69.48	89.81	107.63	43.13	129.67	84.69
Min	10.17	9.89	13.43	12.78	10.21	7.23	8.20	10.11	6.99	12.26	8.46
μ	38.00	27.48	39.18	38.97	35.78	30.03	35.01	32.12	14.19	22.99	16.36
σ	29.29	29.94	43.55	40.22	29.68	18.77	24.81	28.07	13.83	57.06	17.59
Skewness	1.44	0.29	2.32	1.83	1.37	0.75	1.31	1.47	0.43	0.45	0.62
Kurtosis	3.87	3.73	7.44	5.12	4.72	3.14	3.42	4.34	3.70	3.52	7.25
Jarque Bera	0.00	0.42	0.00	0.00	0.00	0.11	0.00	0.00	0.33	0.35	0.00
No of companies	38	45	49	66	73	80	111	146	131	84	101
P/Sales											
Max	3.91	9.61	9.24	10.71	13.68	7.86	12.11	9.04	5.20	10.31	8.96
Min	0.55	0.49	0.44	0.50	0.44	0.38	0.40	0.40	0.13	0.46	0.22
μ	3.91	2.57	2.79	3.00	3.64	3.01	3.37	2.72	1.25	2.98	2.10
σ	5.02	2.44	2.78	2.93	3.63	2.44	3.29	2.60	1.26	3.00	2.15
Skewness	2.41	1.71	1.38	1.65	1.72	0.94	1.52	1.51	1.65	1.40	1.61
Kurtosis	8.63	5.36	3.55	4.85	5.16	2.58	4.33	4.30	5.44	3.81	5.02
Jarque Bera	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
No of companies	38	45	49	66	73	80	111	146	131	84	101
P/D											
Max	378.01	341.59	206.84	181.97	264.52	218.19	221.44	251.32	150.54	425.70	399.74
Min	32.52	27.72	27.21	33.09	35.30	29.43	28.00	25.64	9.67	24.04	16.08
μ	121.73	83.20	73.87	86.87	110.60	92.16	94.07	82.53	36.29	98.58	76.92
σ	91.05	61.65	40.27	42.18	60.97	52.89	56.84	50.59	27.99	77.17	78.21
Skewness	1.59	2.35	1.45	0.69	0.91	0.98	0.91	1.36	2.10	2.49	2.64
Kurtosis	4.71	9.76	4.94	2.77	3.13	3.11	3.74	4.98	8.82	10.55	10.39
Jarque Bera	0.00	0.00	0.00	0.23	0.08	0.05	0.08	0.00	0.00	0.00	0.00
No of companies	36	43	47	62	70	77	110	143	128	83	94

Notes for Table 1

We report the maximum, minimum, mean (μ), standard deviation (σ), skewness, kurtosis, and Jarque Bera reported probability and number of companies for the above valuation ratios. The valuation ratios are ratios have been 'winzorised' for the purposes of regressions conducted in Chapter 5 later in the thesis.

Appendix 4 – Table 1 cont/. – Descriptive Statistics

Panel H: Taiwan	1994	1995	1996	1997	1998	1999	2000
P/B							
Max	6.91	5.08	4.50	8.81	6.06	5.78	5.72
Min	1.62	1.32	1.32	1.34	0.96	0.65	0.48
μ	3.39	2.72	2.68	3.15	2.02	1.85	1.38
σ	1.67	1.16	1.07	1.87	0.94	1.11	0.86
Skewness	1.13	0.87	0.58	1.48	1.74	1.67	2.78
Kurtosis	2.98	2.62	2.00	4.37	7.78	5.77	14.28
Jarque Bera	0.00	0.03	0.08	0.00	0.00	0.00	0.00
No of companies	23	44	90	147	181	154	140
P/E							
Max	110.16	74.92	111.58	160.11	114.88	107.72	150.35
Min	11.25	9.11	10.87	12.32	11.43	11.21	12.87
μ	36.34	28.93	29.89	34.64	30.98	25.74	18.63
σ	29.58	17.60	27.94	35.40	30.35	39.51	31.21
Skewness	1.11	1.26	1.31	1.43	1.80	0.44	1.96
Kurtosis	4.17	3.89	5.47	7.83	5.59	3.03	9.11
Jarque Bera	0.00	0.00	0.00	0.00	0.00	0.45	0.00
No of companies	23	44	90	147	181	154	140
P/Sales							
Max	15.56	9.47	8.02	13.70	9.68	10.44	11.20
Min	0.86	0.74	0.70	0.94	0.69	0.55	0.43
μ	4.17	3.22	3.20	4.08	3.00	2.58	2.03
σ	3.62	2.17	1.96	3.47	2.44	2.39	2.18
Skewness	2.22	1.51	0.82	1.88	1.77	2.26	3.07
Kurtosis	7.36	4.98	2.96	5.63	5.35	7.75	13.17
Jarque Bera	0.00	0.00	0.06	0.00	0.00	0.00	0.00
No of companies	23	44	90	147	181	154	140
P/D							
Max	268.82	169.34	239.35	220.83	176.84	135.29	138.88
Min	26.54	22.88	24.78	24.18	25.63	20.91	12.25
μ	70.36	51.29	80.74	98.70	74.87	57.66	48.74
σ	97.30	58.33	80.18	75.54	58.50	43.61	50.09
Skewness	1.78	1.72	1.55	0.62	0.94	0.99	1.08
Kurtosis	4.18	4.07	3.77	2.03	2.47	2.65	2.70
Jarque Bera	0.17	0.20	0.28	0.74	0.00	0.00	0.55
No of companies	12	28	41	66	59	42	69

Notes for Table 1

We report the maximum, minimum, mean (μ), standard deviation (σ), skewness, kurtosis, and Jarque Bera reported probability and number of companies for the above valuation ratios. The valuation ratios are ratios have been 'winzorised' for the purposes of regressions conducted in Chapter 5 later in the thesis.

Appendix 4 – Table 1 cont/. – Descriptive Statistics

Panel I: Thailand	1993	1994	1995	1996	1997	1998	1999	2000
P/B								
Max	6.80	7.12	7.27	5.46	3.59	3.23	6.65	3.68
Min	0.90	0.82	0.62	0.36	0.13	0.13	0.30	0.15
μ	2.82	3.12	2.35	2.06	0.86	0.86	1.93	0.99
σ	1.56	1.73	1.48	1.29	0.72	0.96	1.96	1.12
Skewness	1.26	0.97	1.60	0.86	1.57	1.37	1.60	1.42
Kurtosis	3.88	3.10	5.89	3.33	5.89	3.75	4.20	4.06
Jarque Bera	0.00	0.02	0.00	0.05	0.00	0.00	0.00	0.00
No of companies	36	69	114	119	122	22	30	30
P/E								
Max	73.79	76.40	91.34	56.34	49.42	20.84	35.27	35.50
Min	5.34	5.34	6.50	4.97	4.56	2.69	3.56	3.56
μ	21.06	26.44	22.32	17.45	7.93	4.53	5.24	5.39
σ	17.13	20.94	21.88	11.30	11.32	7.51	11.99	9.76
Skewness	2.01	1.19	2.10	1.07	1.94	0.81	1.17	1.53
Kurtosis	6.16	3.83	6.83	4.85	8.49	2.92	3.76	5.19
Jarque Bera	0.00	0.00	0.00	0.00	0.00	0.07	0.00	0.00
No of companies	36	69	114	119	122	23	30	30
P/Sales								
Max	10.65	13.46	11.31	9.63	4.61	3.11	6.62	3.89
Min	0.54	0.38	0.31	0.20	0.09	0.03	0.10	0.08
μ	3.11	3.73	2.79	2.29	0.86	0.53	1.28	0.90
σ	2.90	3.45	2.51	2.12	0.90	0.71	1.56	1.03
Skewness	1.51	1.43	1.53	1.90	2.67	2.25	2.23	1.80
Kurtosis	4.21	3.99	4.22	6.61	10.90	7.40	7.51	5.40
Jarque Bera	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
No of companies	36	70	115	121	124	24	30	30
P/D								
Max	173.33	156.64	104.54	30.25	17.50	36.50	323.00	31.00
Min	14.10	13.40	10.80	7.39	5.80	1.64	6.50	8.00
μ	44.84	44.98	29.27	18.82	12.15	16.92	34.00	16.93
σ	48.61	43.74	29.20	7.26	4.30	11.99	44.29	8.21
Skewness	2.39	2.10	2.18	0.07	2.47	0.32	5.18	0.49
Kurtosis	6.89	6.05	6.27	2.15	1.59	1.80	7.89	1.84
Jarque Bera	0.00	0.00	0.03	0.87	0.00	0.71	0.67	0.65
No of companies	34	69	105	111	116	23	13	21

Notes for Table 1

We report the maximum, minimum, mean (μ), standard deviation (σ), skewness, kurtosis, and Jarque Bera reported probability and number of companies for the above valuation ratios. The valuation ratios are ratios have been 'winzorised' for the purposes of regressions conducted in Chapter 5 later in the thesis.

Chapter 4
Are Style Investment Strategies Applicable in the Asian Equity Markets?

Chapter 4 – To Test the Predictability of Asian Stock Returns

4.1 Objective

This chapter determines whether style investment strategies based on commonly used valuation ratios (such as P/B – price-to-book ratio, P/E – price-to-earnings ratio, P/CF – price-to-cash flow ratio P/Sales – price-to-sales ratio and P/D – inverse of dividend yield) can be applied to the Asian Equity Markets.

4.2 Motivation

It is commonly believed that fundamental stock valuation and style analysis works only in developed markets like the United States and that more qualitative methods should be used in inefficient markets such as Asia (including developed economies and emerging economies in Asia). The unprecedented appreciation of the Asian stock market in the 90s before its collapse during the recent Asian crisis in October 1997 has raised doubts as to whether fundamental valuation techniques developed in the United States can be applied in the Asian context.

The Asian market is perceived as a "market where investors ignore basic fundamentals such as earnings, corporate growth etc. It is a market driven by floods of money; a market that trades at mind boggling levels." These doubts continue to persist despite the recent collapse of the stock market during the October 1997 Asian crisis.

In the United States, fundamental stock valuation has a long history dating back to Graham and Dodd's seminal 1934 work linking fundamental variables such as size, earnings yield, dividend yield, cash flow yield, book to market ratios, etc. to stock market returns. However, relatively little research has been published regarding the relationship between stock returns in the Asian Equity Markets and valuation ratios.

Our study in this chapter encompasses markets in developed Asia which includes Japan, Hong Kong and Singapore as well as markets in emerging Asia encompassing Indonesia, Korea, Malaysia, Philippines and Taiwan. Most of the studies on Asia tend to focus on subsets of stocks within each market with limited set of fundamental variables over a relatively short period of time. Our study uses a comprehensive set of data extending over a longer time period covering more market cycles relative to prior studies. We also make use of an exhaustive list of valuation ratios such as P/B, P/E, P/CF, P/Sales and P/D ratios. The effect of size on the results is also tested.

Chapter 4 – To Test the Predictability of Asian Stock Returns

Post-Asian crisis (October 1997), the Asian economies are undergoing structural adjustments to correct their over-expenditure/excess capacity. With the restructuring of both corporate and financial structures, we see the shift in focus amongst corporate towards profitability and minority shareholder interests. The investor mindset has also changed with a renewed focus on sustainable profitability. Thus, the relationships uncovered from historical data linking common stock returns with valuation ratios may not continue to prevail or we may uncover the importance of new variables when a larger set of fundamental variables is considered in our study. Our study aims to capture the impact of the new developments in Asia on the performance of value and growth strategies.

Value and growth stocks may perform differently outside the equity markets of developed countries in US and Europe or the same fundamental/risk variables driving the common stock returns in the US and Europe may no longer do so in Asia due to the following reasons as listed below:

I) Differences In Accounting Practices for the Following Items

a) Goodwill

Goodwill is commonly written off against reserves (predominantly in Hong Kong) or shown as an asset and amortised against current earnings in Singapore and Malaysia. In fact prior to 1994, goodwill capitalised as an asset did not need to be amortised in Malaysia. Goodwill written off against reserves will only have an impact on the Balance sheet, as reserves would be understated by the amount of goodwill.
This would make a stock appear relatively expensive on a P/B basis. Goodwill shown as an asset and amortised values the net assets fairly thereby making valuation ratios based on book values more reliable

b) Depreciation

The practice of large capital expenditure programmes among Japanese and Korean firms results in 'accelerated depreciation' allowances that reduce tax burden.
This causes distortions in tax charges on reported income. For example, during the initial years of the capital expenditure programme the tax charges are lower due to the benefit of accelerated 'tax' depreciation. In later years, when the accelerated 'tax' depreciation is used up, the tax charges on reported income will increase significantly. In western countries, accounting standards require adjustments to the 'effective' tax rates by adjustments known as 'deferred tax'. Absence of deferred tax adjustments in Japan and Korea would lead to higher effective tax rates during periods of low capital expenditure. This will distort the reported after tax earnings. Reported income therefore is a 'noisy' variable and not a good indicator of profitability.

c) Asset Revaluation

The practice of asset revaluation conducted periodically in most Asian countries such as Singapore, Hong Kong and Malaysia may be a fairer reflection of the prevailing market valuation of net assets in the balance sheets. However, once a revaluation is undertaken, it has to be done periodically and for every asset class. Management may sometimes abuse this practice by only conducting a revaluation during inflationary periods thereby increasing the net asset values in its book and avoiding a revaluation during deflationary periods or market downturns making the net asset values unreliable. This would also affect valuation ratio based on book values.

d) Investment Income

Companies with large cross-shareholdings in related companies as in Japan and Korea may result the Profit and Loss statement being distorted by investment income as the investment income masks the true profitability of the core operations of a firm. This is particularly the case where accounting standards do not require 'consolidation' of group accounts. This therefore makes reported income 'noisy' and not a true reflection of the profitability of the core operations of the firm. Hence valuation ratios based on reported income may have lower predictive power in explaining variation in common stock returns

e) Income Manipulation

Due to poor corporate governance and lack of transparency in most of the emerging Asian markets, there is a common tendency for firms to manipulate the reported income so as to smooth earnings through incorrect transfer to and from the equity reserves. This will result in both unreliable book values and reported income figures.

f) Tax Considerations

Taxation on income and capital gains varies from country to country. Corporate tax rates have an impact on net earnings and hence the dividend paying ability of firms. This will have an impact on the choice of stocks favoured by domestic investors. For example in Hong Kong where investors are not taxed on both income and capital gains, there is a tendency to place emphasis on capital gains, thus making dividend yield not an attractive predictor of common stock returns.

ii) Availability of Timely and Quality Research Information varies from Country to Country

The Asian culture is 'less open' than the Western cultures. Disclosure of financial information may not meet the standards of Western countries because a majority of firms are owned by close knit families or by one or more holding companies, giving management no incentive to disclose full information to minority shareholders (e.g. Philippines, Indonesia). Besides, Asian management is of the view that disclosures may give competitors an advantage. However, this is slowly changing since the Asian financial crisis in 1997. Corporate disclosure, transparency and corporate governance have been given priority as firms look to the capital markets as a source of funds. Once again the extent of disclosure varies from country to country. Singapore and Hong Kong are the two markets, which have made progress in this respect.

iii) Transaction Costs

Generally, the transaction costs in Asian markets are higher compared to developed markets in the US and Europe. Transaction costs can have an impact on the difference in behaviour of value and growth portfolios in various countries. Transaction costs affect realised returns of both value and growth portfolios depending on the levels of turnover caused by these strategies during rebalancing. The higher the turnover of stocks in a portfolio the higher the costs.

iv) Liquidity/Turnover

There are concerns of market illiquidity in some smaller Asian markets compared to developed markets as well as differences in liquidity levels between value and growth stocks.

Bekaert et al (2003) found that local liquidity (measured by proportion of daily firm returns averaged over the month) is an important component of expected return variation for all emerging markets in their sample. On the other hand, Geert Rouwenhorst (1999) showed that there is no evidence of a relationship between expected returns and liquidity (measured by share of turnover). Instead he showed that size and value are positively, cross-sectionally correlated with turnover suggesting that return premia do not reflect compensation for illiquidity.

v) Demographics

Bekaert et al (1996) and Bakshi and Chen (1994) proposed that demographics also contributed to differences in stock market performance. Younger investors have a higher demand for housing than for equities. As age increases, more investment is allocated to the stock market. The demographic differences between developed markets particularly in Europe which faces structural aging population problems may explain the differences in stock market performance between itself and some of the Asian markets which have favourable demographic profile.

vi) Investment Framework within a Country – Composition of Retail/ Institutional Investors and Capital Structures.

The behavioural characteristics of retail and institutional investors differ to the extent of investment horizon and availability of research information. Traditionally, retail investors have a short term investment horizon with a view to making money through speculation from common sources of information such as rumours, gossips, leaks and tips and not on solid fundamental reasons. Besides, the pension funds are state managed in most of Asia and traditionally more biased towards the ownership of bonds within their portfolios making these markets subject to the behavioural patterns of retail investors and international investors. However, this is improving as the governments especially in China, Hong Kong and Singapore see the need for the development of private pension plans that have generally more aggressive asset allocation strategies in favour of domestic equities. It has to be also noted that it is a common practice in state pensions to bolster the performance of their stock markets especially in Japan and Malaysia.

vii) Differences in Market Structure

Different countries are dominated by different sectors on a market capitalisation basis. For example, the Korean market is dominated by automobile, financial, industrial materials (mainly petrochemical, steel and cement business), Information Technology (mainly semiconductor business) and telecommunication sectors. The Indonesian market is dominated by resources/industrial materials (mainly timber, cement and pulp & paper), telecommunication and consumer staple related sectors. Companies related to global commodities such as petrochemical, pulp and paper, steel and semiconductor are correlated to their respective global sector rather than their respective domestic markets. Hence, they tend to be related to similar fundamental variables that drive these sectors in the developed markets in the US and Europe.

viii) Differences in Government Policies

Government policies have an impact on the differences in performance of common stocks from one market to another. It is commonly known that the governments in Asia are reluctant to allow their stock markets to operate freely. International funds flow also affect the performance of the Asian markets especially given their low market capitalisations. Barriers to entry such as limits on foreign share ownership to protect the domestic market from large swings in its stock market performance caused by large influx of international fund movements may explain the difference in performance of both value and growth portfolios among these markets versus the developed ones. However, some positive initiatives are being taken to address this issue, e.g. Singapore has made startling progress in the recent years to move to a completely free market economy and has made its capital markets accessible to foreign investors. However, Malaysia saw the imposition of capital controls during the financial crisis in 1997 to prevent large capital outflows from its equity market. Although, the controls are still in place with some relaxations, it has reduced the attractiveness of investing in Malaysia, causing Malaysia to depend largely on its domestic retail and institutional players. The return performance of smaller capitalisation markets such as Thailand, Indonesia and Philippines may be affected greatly by sudden changes in net foreign flows, which may break any relationship between a fundamental variable and returns. Besides, the emphasis on value or growth stocks may differ depending on the composition of retail or institutional investors dominating the funds flow. The retail investors are known to have a short term horizon and generally tend to favour growth stocks.

The differences in institutional and behavioural factors outlined above may affect the performance of both value and growth strategies in different markets causing them to behave differently from one another.

4.3 Hypotheses

Hypothesis I: Stock returns in the Asian Equity Markets are predictable by commonly used valuation ratios such as P/B, P/E, P/CF, P/Sales and P/D.

Numerous studies by Basu (1977, 1983), Ball (1978), Lakonishok et al (1994), Fama and French (1992, 1998), Barbee, Mukherji and Raines (1986), Rozeff (1984) etc. show that value strategies based on valuation ratios produce superior returns. Although, relatively little research has been published regarding the relationships between stock returns in the Asian Equity Markets and valuation ratios, they all show that stock returns can be predictable by valuation ratios despite the peculiarities in the Asian Equity Markets caused by differences in institutional and behavioural factors. As a result of the structural changes taking place in the Asian economies post 1997 Asian crisis, the relationships uncovered from historical studies linking common stock returns with valuation ratios may not continue. There is also scope to uncover the importance of new variables that have predictive power. We provide a comprehensive update on the performance of value and growth strategies incorporating both developed and emerging Asian Equity Markets and an exhaustive list of valuation ratios.

Hypothesis II: Value stocks consistently outperform growth stocks over the long term. However, the superior performance of value stocks is skewed towards down-market periods of the stock market.

Lakonishok et al (1994) showed evidence where the outperformance of value stocks was more pronounced during the worst 25 months of the US stock market as well as during the weakest periods of the US economy.

Hypothesis III: Both valuation ratios and size (as defined by market capitalisation) are key determinants in explaining the cross-sectional average stock returns in the Asian Equity Markets.

It is likely that the small-firm effect is apparent in Asia as a number of markets have their stock markets dominated by a few large capitalisation stocks amongst numerous small capitalisation stocks.

4.4 Portfolio Returns and Characteristics

This section examines the results of our study linking the relationship between stock returns in Asia and commonly used valuation ratios.

Section 4.4.1 summarises the absolute, risk adjusted and size adjusted performances of equally weighted value and growth portfolios sorted respectively on P/B, P/E, P/CF, P/Sales and P/D (inverse of dividend yield) ratio. We also compare the value-growth spreads across the Asian markets based on the results of our analysis with that of other academic studies conducted in Asia such as Chan et al (1991), Bauman et al (1998) and Fama and French (1998). This aims to determine whether the relationships uncovered from historical studies linking common stock returns with valuation ratios continue to prevail or there may be new variables with predictive powers that emerge from our study. In order to test the robust predictive powers of the valuation ratios, we also determine whether the value premiums are consistent across markets and across time such as in times of bull market and bear market periods. Section 4.4.2 repeats the same analysis on market capitalisation weighted value and growth portfolios. Most academic studies have concentrated their analysis based on the performance of equal weighted portfolios. However, the nature of the Asian Equity Markets driven by a few very large companies amongst numerous small capitalisation stocks may cause the results based on market capitalisation weighted portfolios to differ with the influence of size-based effect. Section 4.4.3 further examines the relationship between valuation ratios (in this case P/B and P/E ratio), firm size and stock returns in order to determine which effect is more predominant in explaining cross-sectional stock returns. It tests the extent of P/B and P/E effect when portfolios are constructed by controlling for the effect of firm size, as well as the extent of firm size effect when portfolios are constructed by controlling for the P/B and P/E effect respectively. We document our conclusions in Section 4.4.4.

4.4.1 Equally Weighted Portfolios

Table 4.1 summarises the average monthly returns, risk adjusted average monthly returns and size adjusted average monthly returns for equally weighted value and growth portfolios. The portfolios are sorted on P/B, P/E, P/CF, P/Sales and P/D (inverse of dividend yield) ratios.

Within the table, value and growth portfolios are denoted by V and G respectively and the difference between them V-G. The first row for each country is the average monthly return (AR). The second row is the standard deviation of monthly returns in (parentheses) or t-statistic testing whether V-G is different from zero in [brackets]. The third row is the risk adjusted rate of returns (RR) which is the ratio of AR to standard deviation of monthly returns. The fourth row is the size adjusted average monthly return (SAAR).

The results based on both average returns and size adjusted returns show strong evidence of value premium in both developed and emerging Asia stock returns confirming the observations by Bauman et al (1998), Capaul et al (1993), Chan et al (1991) and Fama and French (1998). The results also show that value portfolios on average earn higher risk adjusted rates of returns than growth stocks. For example, value-growth spread in Hong Kong based on P/B ratio (column 1) is 1.07% and 0.89% using average monthly return and size adjusted average monthly return respectively.

Using average monthly returns, eight out of nine P/B value-growth spreads are positive, eight out of nine P/Sales value-growth spreads are positive, eight out of nine P/D value-growth spreads are positive, all nine P/E and all nine P/CF value-growth spreads are positive. Portfolios that have negative spreads are noted for the following: portfolios sorted on P/B and P/D in Taiwan and portfolio sorted on P/Sales in Singapore.

Chapter 4 – To Test the Predictability of Asian Stock Returns

Table 4.1 – Monthly Returns for Equally Weighted Value and Growth Portfolios

	P/B			P/E			P/CF			P/Sales			P/D		
	V	G	V-G	V	G	V-G	V	G	V-G	V	G	V-G	V	G	V-G
Hong Kong 6/90 – 6/2001															
AR	1.62	0.55	**1.07**	1.14	0.52	**0.63**	1.22	0.65	0.57	1.22	0.81	0.41	**1.13**	0.82	0.31
	(10.28)	(8.38)	**[2.52]**	(8.52)	(8.82)	**[2.52]**	(8.68)	(9.02)	[1.66]	(9.98)	(8.91)	[0.86]	(7.84)	(9.58)	[0.84]
RR	0.16	0.07		0.13	0.06		0.14	0.07		0.12	0.09		0.14	0.09	
SAAR	1.36	0.46	**0.89**	1.02	0.44	**0.57**	0.99	0.54	0.45	0.84	0.82	0.02	**1.13**	0.85	0.28
	(9.99)	(9.14)	**[2.59]**	(8.76)	(9.23)	**[2.39]**	(8.51)	(9.69)	[1.41]	(8.87)	(9.29)	[0.06]	(7.93)	(10.23)	[0.70]
Indonesia 6/93 – 6/2001															
AR	2.63	-0.20	**2.83**	2.07	-0.30	**2.37**	2.20	-0.27	**2.47**	2.50	-0.37	**2.87**	2.81	0.18	**2.64**
	(17.88)	(9.87)	**[2.24]**	(11.08)	(10.56)	**[3.71]**	(12.04)	(11.09)	**[3.35]**	(17.90)	(10.57)	**[2.30]**	(18.41)	(11.33)	**[1.99]**
RR	0.15	-0.02		0.19	-0.03		0.18	-0.02		0.14	-0.04		0.15	0.02	
SAAR	1.59	-0.35	1.94	1.75	-0.31	**2.06**	1.27	-0.18	**1.45**	1.59	-0.30	1.89	2.10	0.02	2.08
	(18.43)	(11.65)	[1.50]	(11.50)	(11.45)	**[2.60]**	(11.62)	(12.47)	**[2.10]**	(18.48)	(11.14)	[1.56]	(18.10)	(12.38)	[1.62]
Japan 6/90 – 6/2001															
AR	-0.30	-0.74	**0.44**	-0.35	-0.71	**0.36**	-0.44	-0.62	0.19	-0.45	-0.59	0.14	-0.34	-0.67	0.34
	(7.35)	(7.42)	**[2.47]**	(6.76)	(7.29)	**[2.19]**	(6.88)	(6.92)	[1.19]	(7.83)	(6.63)	[0.65]	(7.71)	(6.15)	[1.31]
RR	-0.04	0.10		-0.05	-0.10		-0.06	-0.09		-0.06	-0.09		-0.04	-0.11	
SAAR	-0.31	-0.79	**0.49**	-0.36	-0.72	**0.36**	-0.41	-0.64	0.23	-0.47	-0.60	0.13	-0.33	-0.72	0.40
	(7.36)	(7.67)	**[3.02]**	(6.72)	(7.36)	**[2.25]**	(6.78)	(7.09)	[1.74]	(7.94)	(6.92)	[0.72]	(7.73)	(6.23)	[1.65]
Korea 6/93 – 6/2001															
AR	0.30	-0.66	0.96	1.06	-0.67	**1.74**	1.24	-0.84	**2.08**	0.38	-0.39	0.77	0.43	-0.35	0.78
	(14.43)	(11.55)	[1.10]	(13.92)	(11.59)	**[2.37]**	(14.11)	(11.88)	**[2.45]**	(15.51)	(12.17)	[0.82]	(13.86)	(11.92)	[0.95]
RR	0.02	-0.06		0.08	-0.06		0.09	-0.07		0.02	-0.03		0.03	-0.03	
SAAR	-0.14	-0.70	0.55	0.74	-0.72	**1.46**	0.80	-0.92	**1.72**	-0.08	-0.13	0.05	0.06	-0.31	0.37
	(13.60)	(11.75)	[0.76]	(13.31)	(12.05)	**[2.25]**	(13.16)	(12.48)	**[2.44]**	(14.01)	(13.00)	[0.08]	(13.28)	(12.20)	[0.50]
Malaysia 6/93 – 6/2001															
AR	0.65	-0.38	1.02	1.04	-0.16	**1.20**	0.99	0.07	**0.93**	0.42	-0.09	0.51	1.20	-0.59	**1.78**
	(16.77)	(13.54)	[1.83]	(14.30)	(14.74)	**[3.50]**	(14.67)	(13.80)	**[2.50]**	(15.58)	(14.64)	[1.06]	(14.11)	(14.81)	**[3.80]**
RR	0.04	-0.03		0.07	-0.01		0.07	0.01		0.03	-0.01		0.08	-0.04	
SAAR	0.62	-0.53	**1.14**	0.88	-0.22	**1.10**	0.79	0.07	**0.72**	0.33	-0.13	0.46	1.06	-0.61	**1.67**
	(16.60)	(14.18)	**[2.30]**	(13.95)	(14.95)	**[3.33]**	(13.98)	(14.41)	**[2.41]**	(15.18)	(15.00)	[1.16]	(13.96)	(15.07)	**[3.79]**
Philippines 6/94 – 6/2001															
AR	2.05	-0.80	**2.84**	1.42	-0.62	**2.04**	0.30	-0.38	0.68	0.52	-0.33	0.85	0.52	-0.08	0.59
	(12.55)	(8.63)	**[2.91]**	(13.39)	(9.19)	**[1.99]**	(12.91)	(8.94)	[0.80]	(10.82)	(10.75)	[1.49]	(9.77)	(9.11)	[0.80]
RR	0.16	-0.09		0.11	-0.07		0.02	-0.04		0.05	-0.03		0.05	-0.01	
SAAR	-0.10	-0.83	0.72	1.12	-0.69	1.81	0.02	-0.54	0.56	0.13	-0.44	0.57	0.35	-0.20	0.54
	(14.42)	(8.81)	[0.63]	(13.51)	(9.05)	[1.83]	(12.78)	(8.71)	[0.63]	(11.36)	(10.72)	[0.86]	(9.53)	(9.47)	[0.71]
Singapore 6/90 – 6/2001															
AR	1.76	0.07	1.69	1.05	0.06	**0.98**	0.98	0.39	0.59	0.98	1.18	-0.21	1.98	0.20	1.77
	(26.21)	(8.29)	[0.79]	(9.43)	(8.99)	**[3.85]**	(9.90)	(9.11)	[1.89]	(11.49)	(23.88)	[-0.11]	(31.14)	(9.22)	[0.68]
RR	0.07	0.01		0.11	0.01		0.10	0.04		0.08	0.05		0.06	0.02	
SAAR	1.13	-0.05	1.18	0.95	0.01	**0.94**	0.85	0.19	**0.66**	0.72	0.90	-0.18	1.40	0.23	1.17
	(21.56)	(9.10)	(0.69)	(9.19)	(9.18)	**[3.58]**	(9.34)	(9.67)	**[2.41]**	(10.95)	(37.37)	[-0.06]	(29.32)	(28.22)	[0.48]
Taiwan 6/94 – 6/2001															
AR	-0.88	-0.28	-0.60	-0.06	-0.92	**0.86**	0.04	-0.57	0.61	-0.31	-0.56	0.25	-0.23	-0.20	-0.03
	(10.20)	(9.50)	[-0.85]	(8.44)	(9.30)	**[2.03]**	(8.63)	(9.00)	[1.21]	(9.25)	(9.12)	[0.64]	(8.17)	(9.06)	[-0.04]
RR	-0.09	-0.03		-0.01	-0.10		0.01	-0.06		-0.03	-0.06		-0.03	-0.02	
SAAR	-0.77	-0.36	-0.41	-0.11	-0.99	**0.88**	0.04	-0.64	0.68	-0.27	-0.70	0.42	-0.16	-0.33	0.17
	(9.73)	(9.79)	[-0.67]	(8.33)	(9.21)	**[2.17]**	(8.76)	(9.08)	[1.32]	(8.75)	(9.23)	[1.38]	(7.81)	(9.18)	[0.26]
Thailand 6/93 – 6/2001															
AR	1.35	-1.07	**2.42**	0.98	-0.73	**1.71**	1.46	-0.28	**1.74**	1.71	-1.01	**2.72**	1.12	-0.63	**1.75**
	(12.33)	(9.87)	**[2.98]**	(10.87)	(8.49)	**[2.79]**	(11.04)	(9.90)	**[2.25]**	(11.23)	(10.61)	**[3.57]**	(11.30)	(9.34)	**[2.42]**
RR	0.11	-0.11		0.09	-0.09		0.13	-0.03		0.15	-0.10		0.10	-0.07	
SAAR	0.28	-0.75	1.03	0.60	-0.54	1.15	1.03	-0.12	1.16	1.17	-0.64	**1.82**	0.83	-0.18	1.01
	(15.61)	(8.80)	[0.87]	(11.82)	(8.07)	[1.65]	(11.88)	(10.23)	[1.28]	(11.38)	(9.13)	**[2.45]**	(12.02)	(9.01)	[1.37]

Notes for Table 4.1

Value and growth portfolios are formed on P/B, P/E, P/CF, P/Sales and P/D. Firms are weighted equally within each portfolio. We denote value (stocks in fractile1) and growth (stocks in fractile 3) portfolios by V and G respectively and the difference between them V-G. V-G is in bold when statistically significant at 5% level.The first row for each country is the average monthly return (AR). The second is the standard deviation of monthly returns in (parentheses) or t – statistic testing whether V-G is different from zero in [brackets]. The third row is the risk adjusted rate of returns (RR) which is the ratio of AR to standard deviation of monthly returns. The fourth row is the size adjusted average monthly return (SAAR). The last row contains the standard deviation of size adjusted average monthly returns in (parentheses) or t – statistic testing whether V-G is different from zero in [brackets].

The results in terms of the number of portfolios with positive value-growth spreads are similar when size adjusted average monthly returns (where portfolios are constructed by controlling for the effect of firm size) are used. The exception is for the P/D ratio where all nine portfolios have value-growth spreads that are positive (as opposed to only 8 when average monthly returns are used). However, the size of the value-growth spreads are reduced for 33 out of 45 portfolios when average monthly returns are replaced with size adjusted average monthly returns. Portfolios that observe a difference between average monthly returns and size adjusted average monthly returns of more than 0.50% are noted for the following portfolios sorted on:

- P/B, P/CF, P/Sales and P/D in Indonesia
- P/Sales in Korea
- P/B in Philippines
- P/B and P/D in Singapore
- P/B, P/E, P/CF, P/Sales and P/D in Thailand

The above results suggest that the superiority of the value strategy may be attributable to the small–firm effect. The spreads are reduced when the portfolios are controlled for the effect of firm size. The small-firm effect is apparent in Asia particularly in the smaller emerging Asian markets like Indonesia and Thailand. These equity markets are dominated by a few large capitalisation stocks amongst numerous small capitalisation stocks.
The exceptions that observe an increase or no change in the size of the spreads are noted for portfolios sorted on:

- P/B, P/E, P/CF and P/D in Japan
- P/B in Malaysia
- P/CF and P/Sales in Singapore
- P/B, P/E, P/CF, P/Sales and P/D in Taiwan.

To summarise, the above analysis provides evidence that valuation ratios are able to predict the cross-sectional stock returns of the Asian Equity Markets. Value stocks outperform growth stocks. Moreover, value premium in the Asian markets is influenced by the small firm-effect.

We next proceed to compare the value-growth spreads across the Asian markets based on the results of our analysis with that of other academic studies conducted in Asia such as Chan, et al (1991), Bauman et al (1998) and Fama and French (1998).

4.4.1.1 Comparison of Results in Table 4.1 with Other Academic Studies Conducted in Asian Developed Markets

Japan

The results show that only value premiums based on P/B and P/E are significantly different from zero at the 5% level.

However, average monthly spread in returns between the value and growth portfolios sorted on P/B at 0.44% (column 1) is smaller than that recorded by Chan et al (1991), Fama and French (1998) and Bauman et al (1998). Chan et al had obtained an average monthly spread of 1.1% for equally weighted portfolios while Fama and French using market capitalisation weighted portfolios and Bauman et al using equally weighted portfolios, had each recorded spread sizes of approximately 0.75%. However, the size of the spread was compatible with that of Capaul et al (1993)who had recorded an average monthly spread of 0.5% for market capitalisation weighted portfolios.

The value premiums based on P/CF and P/D are not significantly different from zero at the 5% level which differ from the the results of Chan et al (1991) and Fama and French (1998) respectively. The results of Chan et al showed that P/CF had significant positive influence on returns with a T-statistic of 4. Fama and French showed that the value premiums for portfolios sorted on P/CF and P/D are 3 and 2.5 standard errors from zero respectively.

This difference in results could be due to the following:

a) Different test sample periods and database used. Chan et al's analysis was conducted on TSE I and II stocks over the period from 1971 to 1988. Fama and French conducted their studies on stocks within the MSCI Index over the period from 1974 to 1994. The data used in our studies considered stocks in the Worldscope universe over the period from 1990 to 2001. The Japanese equity market recorded superior returns during the 80s (economic boom period) while the market performance has been lacklustre in the mid 90s (economic doldrums). The average monthly return for the MSCI Japan Index which represents the broad stock market performance was 1.7% during the period from January 1980 to December 1989 whereas the average monthly return was -0.3% during the period from January 1990 to June 2001.

b) Chan et al had recorded the spreads of the portfolios based on extreme lowest and highest quartiles of stocks sorted by P/B and stocks were equally weighted; while our set of results is based on three fractiles. However, the size of the average monthly spread in returns reduced from 1.1% to 0.69% when their universe of stocks was broken into just two portfolios. This was achieved by averaging the monthly returns of quintiles 1 and 2 to form the average monthly returns for the value portfolio and correspondingly averaging the returns of quintiles 3 and 4 to represent the growth portfolio. Hence, the size of the spread was more closely compatible with the size of the spread of 0.44% as recorded by our results and of 0.5 % as recorded by Capaul et al. Our study is based on sorting the universe of stocks based on P/B into 3 fractiles and measuring the average monthly spread as the difference between the two extreme fractiles. Capaul et al had sorted the stocks within the MSCI Index over the period from 1981 to 1992 based on just two portfolios.

Hong Kong/Singapore

Similar to the findings in Japan, only value premiums based on P/B and P/E are significantly different from zero at the 5% level.

The results show some differences when compared to the findings of Fama and French. The sizes of the spread are different from the results showed by Fama and French as their results are based on market capitalisation weighted portfolios and influenced by size-effect. The average monthly spread in returns for the Hong Kong portfolios sorted on P/B is 1.07 (column 1); while Fama and French had recorded a spread of 0.60%. Similarly, the average monthly spread in returns for the Hong Kong portfolios sorted on P/E is 0.63% while Fama and French had recorded a spread of 0.42%. Besides, value-growth spreads based on P/B and P/E are statistically significant in Hong Kong contrary to the results of Fama and French.

The spreads in returns for the Singapore portfolios sorted on P/B, P/E, P/CF, P/D are 1.69% (column 1), 0.98% (column 2), 0.59% (column 3) and 1.77% (column 5) respectively while Fama and French had observed spreads of 0.81%, 0.17%, 0.45% and -0.21% respectively. The spread in Singapore based on P/E is statistically significant although there is an inverted U-shaped pattern in the portfolio returns. The value (lowest P/E) portfolio has a lower average monthly return than the second fractile portfolio. Moreover, the spread in Singapore based on P/B is not statistically significant. Fama and French instead showed that the spread in Singapore based on P/B was statistically significant but not for the spread based on P/E.

Emerging Markets

Portfolios formed on both P/B and P/E in the emerging Asian markets show evidence of consistent value premium in their returns with the exception of Taiwan based on P/B. Generally, the spreads are greater than 1% except for Taiwan based on P/B with a spread of –0.60% (column 1).

However, the results differ from those of Fama and French (1998) who showed no consistency in results based on P/E in Korea, Malaysia, Philippines and Taiwan. Fama and French had negative spreads for portfolios sorted on P/E in Malaysia, Philippines and Taiwan. Moreover, the spread recorded by them based on P/E in Korea is smaller with a value of 1.19% that is statistically insignificant at the 5% level compared to our results with a spread of 1.74% and is 2.3 standard errors from zero (column 2). They also recorded a sizable value premium of 0.37% in Taiwan based on P/B although it was only 0.4 standard errors from zero.

The results as shown in Table 4.1 are different from the findings of Fama and French (1998) for both the developed and emerging Asian markets could due to the following reasons:

Different test sample periods and database used. The analysis conducted by Fama and French covered the Asian markets in the MSCI EAFE Index and the emerging markets in the IFC Index over the period from 1974 to 1994. The results of Fama and French may have been influenced by effects of size; as stocks incorporated within the MSCI and IFC indices are relatively large. Our studies are based on stocks in the Worldscope universe over the period from 1990 to 2001 for the developed markets and 1993-2001 for most of the emerging markets.

In general, the results of Table 4.1 for the developed and emerging Asian markets show that value premiums for individual countries are large in economic terms but are not typically large relative to their standard errors using two tailed T-statistics tests at the 5% level. 22 out of 45 portfolios studied have value premiums that are not significant at the 5% level (this figure reduces to 19 out of 45 portfolios using two tailed T-statistics at the 10% level). This is especially true for a majority of portfolios sorted on P/CF, P/Sales and P/D ratios.

However, the results show that the value premiums for portfolios sorted on P/E ratio using average monthly returns are statistically consistent at the 5% level across all countries. This is also true using size adjusted average monthly returns, where the P/E value premiums are statistically consistent with the exception for Philippines and Thailand. Nonetheless, their T-statistics are still fairly large; significant at the 10% level.

Although reported earnings after tax is usually a noisy variable and prone to distortions; the results of our study appear to show that P/E ratio has the most significant and consistent predictive power on the average stock returns across all countries in the Asian Equity Markets in our sample universe (based on the results in Table 4.1). Similar results were noted by Bekaert et al (1996) where P/E produced the most consistent results in the Asian markets.We provide a number of reasons that may reflect the importance of P/E ratio as a predictor of returns as follows:

- as Asia undergoes restructuring in its corporate and financial structures (driven in part by maturing capital markets) there is a growing shift in focus amongst corporate towards profitability
- the investor mindset is also changing with a renewed focus towards sustainable profitability
- P/E is a popular variable (widely available and easily understood by analysts and retail investors alike). EPS forecasts are widely used as a proxy for future profitability as well as risk
- reported EPS figures are updated quarterly and forecasts are easily available compared to other variables e.g. Book value, sales, cash flow etc
- makes easy comparison across stocks because it is easily available and simple to understand
- P/E reflects the market perceptions and moods for a country, sector or stock

In summary, the results show that stock returns in Asia are predictable. There is a significant cross-sectional relationship between the valuation ratios and stock returns in the Asian Equity Markets. There is conclusive evidence that P/E ratio is the most significant predictor of cross-sectional average stock returns in the developed and emerging Asian markets. Our results are in contrast to earlier academic studies conducted on both the developed and emerging Asian markets which show P/B ratio as having the most significant and consistent impact on expected stock returns. This highlights that there is no guarantee that relationships uncovered from historical data will prevail in the future as markets and their institutional frameworks go through structural changes. As explained by Campbell Harvey (1995), as these markets evolve over time, the degree of integration with developed markets changes over time which induces time variation in risk exposures (both local and global exposures) which explain their cross-sectional returns.

We next test the robustness of the predictive powers of the valuation ratios by analysing the consistency of the value premiums across markets and across time such as in times of bull market and bear market periods.

4.4.1.2 Consistency of Value-Growth Spreads Across Markets and Time

Table 4.2, using average monthly returns and size adjusted average monthly returns for equally weighted value and growth portfolios, summarises the consistency of the value premiums across markets and across time. It examines the performance of value and growth stocks in each country during periods of both positive and negative performance of the broad benchmark in each country as represented by the MSCI local country Index.We adopt similar approach used by Fama and French (1992), Dimson and Marsh (2001) and Campbell, Lo and MacKinlay (1997) where they partition their data over sub-periods to test the consistency of their conclusions. We therefore analyse the consistency of the value-growth spreads in different sub-periods in our sample study. We analyse the performance of value and growth stocks over three sub-periods based on the results in Table 4.1: prior to the Asian crisis, during the Asian crisis and post Asian crisis which includes the technology bubble period of 1999-2000.

The results in Table 4.2 using both average monthly returns (AR) and size adjusted average monthly returns (SAAR) show evidence that value and growth stocks perform differently in different markets and at different times.

Table 4.2 – Average Monthly and Size Adjusted Average Monthly Spreads for Equally Weighted Portfolios

	P/B		P/E		P/CF		P/Sales		P/D	
	AR	SAAR	AR	SAAR	AR	SAAR	AR	SAAR	AR	SAAR
Hong Kong 6/90 – 6/2001										
Frequency of positive spreads	57%	56%	60%	63%	54%	56%	48%	53%	54%	56%
Frequency of positive spreads during positive stock market return months	56%	59%	48%	56%	43%	48%	33%	41%	40%	47%
Frequency of positive spreads during negative stock market return months	57%	53%	76%	71%	66%	66%	66%	68%	71%	68%
Indonesia 6/93 – 6/2001										
Frequency of positive spreads	58%	60%	63%	55%	66%	58%	58%	54%	61%	57%
Frequency of positive spreads during positive stock market return months	43%	64%	43%	47%	51%	53%	49%	55%	47%	51%
Frequency of positive spreads during negative stock market return months	73%	57%	82%	63%	80%	63%	67%	53%	76%	63%
Japan 6/90 – 6/2001										
Frequency of positive spreads	61%	61%	61%	59%	55%	57%	53%	48%	54%	54%
Frequency of positive spreads during positive stock market return months	48%	45%	50%	47%	42%	43%	56%	57%	63%	67%
Frequency of positive spreads during negative stock market return months	72%	74%	71%	69%	67%	68%	50%	42%	46%	43%
Korea 6/93 – 6/2001										
Frequency of positive spreads	54%	51%	60%	58%	58%	58%	49%	48%	52%	50%
Frequency of positive spreads during positive stock market return months	50%	45%	57%	52%	64%	64%	45%	39%	45%	43%
Frequency of positive spreads during negative stock market return months	58%	56%	63%	63%	54%	54%	52%	56%	58%	56%
Malaysia 6/93 – 6/2001										
Frequency of positive spreads	60%	66%	70%	71%	70%	69%	61%	65%	70%	69%
Frequency of positive spreads during positive stock market return months	65%	67%	52%	52%	29%	56%	50%	54%	28%	54%
Frequency of positive spreads during negative stock market return months	61%	64%	86%	88%	78%	80%	72%	74%	80%	82%
Philippines 6/94 – 6/2001										
Frequency of positive spreads	60%	55%	57%	57%	57%	55%	57%	55%	55%	57%
Frequency of positive spreads during positive stock market return months	46%	54%	56%	56%	64%	62%	51%	54%	38%	56%
Frequency of positive spreads during negative stock market return months	71%	56%	58%	58%	51%	49%	62%	56%	69%	58%
Singapore 6/90 – 6/2001										
Frequency of positive spreads	52%	55%	66%	66%	57%	53%	53%	49%	58%	60%
Frequency of positive spreads during positive stock market return months	51%	53%	59%	59%	51%	45%	51%	55%	47%	49%
Frequency of positive spreads during negative stock market return months	53%	58%	75%	75%	64%	63%	56%	42%	71%	73%
Taiwan 6/94 – 6/2001										
Frequency of positive spreads	46%	45%	56%	57%	58%	58%	55%	55%	49%	49%
Frequency of positive spreads during positive stock market return months	37%	37%	45%	47%	55%	61%	50%	50%	42%	45%
Frequency of positive spreads during negative stock market return months	54%	52%	65%	65%	61%	57%	59%	59%	54%	52%
Thailand										
Frequency of positive spreads	65%	57%	64%	60%	67%	63%	66%	60%	56%	58%
Frequency of positive spreads during positive stock market return months	50%	61%	63%	72%	59%	67%	50%	65%	41%	57%
Frequency of positive spreads during negative stock market return months	78%	54%	64%	50%	74%	58%	80%	56%	70%	60%

Notes for Table 4.2

Value and growth portfolios are formed on P/B, P/E, P/CF, P/Sales and P/D. Firms are weighted equally within each portfolio. Value-growth spreads are computed using average monthly return (AR) as well as size adjusted average monthly return (SAAR).

Value stocks consistently outperform growth stocks at a frequency of more than 50% of the months observed based on average monthly returns. This is with the exception of P/Sales (column 4) value-growth spreads in Hong Kong and Korea; and P/B value-growth spread in Taiwan (column 1) which are positive less than 50% of the months observed.It is worth noting that the spreads for the above exceptional cases are not significant at the 5% level as shown in Table 4.1. It is also interesting to note that exceptions do not occur for value-growth spreads based on P/E confirming the results in Table 4.1 that P/E ratio is the most significant predictor of cross-sectional average stock returns.

Positive value-growth spread is skewed towards periods when the stock market performance is negative. The frequency of positive value-growth spreads during periods of stock market decline is higher than the frequency observed during periods of positive performance of the stock market. For example, the Hong Kong value-growth spread sorted on P/E (column 2) is positive 48% of the months during periods of positive stock market returns but 76% of the months during periods of negative stock market returns. However, the exceptions are for Japan and Korea and Malaysia. The Japan value-growth spread sorted on P/Sales (column 4) is positive for 56% of the months during periods of positive stock market returns but 50% of the months during periods of negative stock market returns. Similarly, in Korea, value-growth spread sorted on P/CF (column 3) is positive 56% of the months during periods of positive stock market returns but 54% of the months during periods of negative stock market returns. In Malaysia, the value-growth spread sorted on P/B (column 1) is positive 65% of the months during periods of positive stock market returns but 61% of the months during periods of negative stock market returns. Nonetheless, the value-growth spreads for Japan, Korea and Malaysia are still positive at a frequency of at least 50% of the months observed even during down-market periods of the broad stock market.

We also analyse the performance of value and growth stocks over different time periods in our sample study based on the results in Table 4.1: prior to the Asian crisis, during the Asian crisis and post Asian crisis which includes the technology bubble period of 1999-2000. Over the long term horizon, performance favours value stocks. Value stocks outperform growth stocks up to and during the Asian crisis.The outperformance of value stocks during the Asian crisis period is more pronounced for smaller stocks. For example, the performance of value stocks for Indonesia is 7.5% compared to 0.91% for growth stocks during the crisis period. Although value stocks were negatively affected during the Asian crisis, value stocks recovered dramatically compared to growth stocks. However, post Asian crisis which includes the technology bubble period, performance favoured growth stocks.

Value stocks consistently outperform growth stocks at a frequency of more than 50% of the months observed when average monthly returns are replaced with size adjusted average monthly returns. The exceptions occur for Japan, Korea and Singapore based on P/Sales (column 4), Taiwan and Korea based on P/D (column 5) and Taiwan based on P/B (column 1). We also observe that these noted exceptional cases in Table 4.1 are statistically not significant at both the 5% and 10% levels using size adjusted average monthly returns.

Moreover, there are a few markets where the frequency of value stocks outperforming growth stocks falls significantly by more than 5% when average monthly returns are replaced with size adjusted average monthly returns. This is observed in the value premium for Indonesia where the frequency falls from 63% to 55% and from 66% to 58% for portfolios sorted on P/E (column 2) and P/CF (column 3) respectively when size adjusted average monthly returns are used. Similarly, for Thailand sorted on P/B (column 1) where the frequency falls from 65% to 57% when size adjusted average monthly returns are used. The frequency of positive value premiums that occur during months of negative stock market returns falls from 82% to 63% for portfolios sorted on P/E (column 2) in Indonesia, 80% to 63% for portfolios sorted on P/CF (column 3) in Indonesia and from 78% to 54% for portfolios sorted on P/B (column 1) in Thailand when average monthly returns are replaced with size adjusted average monthly returns. The influence of the effects of size is magnified in Indonesia and Thailand as these markets are dominated by a few large capitalisation stocks amongst numerous small capitalisation stocks that suffer poor trading volumes. The small capitalisation stocks do not suffer as badly as the larger and more liquid stocks during periods of stock market decline. During a downturn, the more 'heavily held' and liquid large capitalisation stocks (which are a proxy for the markets) face severe selling pressures and their prices show sharper declines compared to small capitalisation stocks. The frequency of positive value-growth spreads that occur in periods of stock market decline decreases when portfolios in Indonesia and Thailand are constructed by controlling for the effect of firm size.

In summary, the results show evidence that value stocks outperform growth stocks over long term horizon. Value stocks consistently outperform growth stocks at a frequency of more than 50% for the months observed. Consistency in performance is an alternative measure of risk for both value and growth portfolios compared to the stereotype measures of risk based on beta and standard deviation. If value strategy is fundamentally riskier, then it should underperform relative to growth strategy during periods when the stock market performance is negative. Our results instead show that the frequency of value strategy outperforming growth strategy is higher during periods of stock market decline than the frequency observed during periods of positive performance of the stock market, even when returns are adjusted for the size-effect. We also observe that the outperformance of value stocks is more pronounced during the Asian crisis particularly for the smaller markets like Indonesia and Philippines Although value stocks were negatively affected during the Asian crisis, value stocks recovered dramatically compared to growth stocks. This is noted for companies with sound fundamentals supported by certainty in earnings, cashflow and dividend payments which do not justify their low valuation levels exacerbated by the negative sentiment during the crisis period.The consistency in value premiums and the observations in Table 4.1 (higher risk adjusted returns for value strategies) do not agree with the Fama and French (1995,1996) argument that superior returns of value strategies represent compensation of risk consistent with rational, efficient pricing of equity markets.The results are consistent with the findings of Lakonishok, Shleifer and Vishny (1994).

4.4.2 Market Capitalisation Weighted Portfolios

This section applies similar analysis conducted in Section 4.4.1 but this time on market capitalisation weighted value and growth portfolios. This helps determine the influence of size effect on the value-growth spreads across markets.

Table 4.3 summarises the average monthly returns, risk adjusted average monthly returns and size adjusted average monthly returns for market capitalisation weighted value and growth portfolios. The portfolios are sorted on P/B, P/E, P/CF, P/Sales and P/D ratios. The information is presented in the same format as Table 4.1.

The value premiums based on average returns and risk adjusted rate of returns are inconsistent with the results in Table 4.1. Using average monthly returns, five out of nine P/B value-growth spreads are positive, five out of nine P/Sales value-growth spreads are positive, six out of nine P/D value-growth spreads are positive, eight out of nine P/CF value-growth spreads are positive, all nine P/E value-growth spreads are positive. 41 out of the 45 portfolios have value-growth spreads that are not statistically significant using two tailed T-statistics tests at the 5% level. This figure reduces to 37 when two tailed T-statistics at the 10% level is used.

However, the results in Table 4.3 are generally compatible with the results in Table 4.1 when average monthly returns are replaced with size adjusted average monthly returns. Seven out of nine P/B value-growth spreads are positive, seven out of nine P/Sales value-growth spreads are positive, all nine P/D value-growth spreads are positive, all nine P/E and all nine P/CF value-growth spreads are positive. The magnitude of the spreads are also compatible with the results in Table 4.1 when size adjusted average monthly returns are used. The magnitude of the size adjusted average monthly spreads are all within ± 0.50% deviation of that of the spreads in Table 4.1 for 40 out of 45 portfolios.

It is interesting to note that in most cases, the influence of size is observed more on the performance of growth portfolios when they are weighted by market capitalisation. Asian markets are dominated by few large capitalisation stocks amongst numerous small capitalisation stocks. During a 'bull' market, investor money chases the few better known large capitalisation stocks which have higher liquidity and are regarded as proxy stocks for the market. This results in higher P/B, P/E, P/CF, P/Sales and P/D valuations for the large 'liquid' stocks which then fall under the category of 'growth' stocks. However, the returns of the market capitalisation weighted growth portfolios when controlled for the effect of firm size are reduced and more in line with those of the equally weighted growth portfolios in Table 4.1; hence bringing the spreads closer to that of Table 4.1.

Chapter 4 – To Test the Predictability of Asian Stock Returns

Table 4.3 – Monthly Returns for Market Capitalisation Weighted Value and Growth Portfolios

	P/B			P/E			P/CF			P/Sales			P/D		
	V	G	V-G	V	G	V-G	V	G	V-G	V	G	V-G	V	G	V-G
Hong Kong 6/90 – 6/2001															
AR	1.02	1.33	-0.31	1.02	0.94	0.08	0.93	1.38	-0.45	0.57	1.12	-0.55	1.23	1.23	-0.00
	(10.51)	(8.11)	[-0.67]	(9.77)	(8.39)	[0.20]	(8.74)	(8.71)	[-1.09]	(8.57)	(8.77)	[-1.29]	(8.55)	(8.60)	[-0.00]
RR	0.10	0.16		0.10	0.11		0.11	0.16		0.07	0.13		0.14	0.14	
SAAR	0.99	0.38	0.61	1.01	0.23	**0.78**	0.93	0.47	0.46	0.62	0.51	0.12	1.07	0.45	0.62
	(9.88)	(8.49)	[1.64]	(8.75)	(8.42)	**[3.22]**	(8.14)	(9.09)	[1.38]	(8.43)	(9.08)	[0.33]	(8.04)	(9.42)	[1.87]
Indonesia 6/93 – 6/2001															
AR	0.18	0.19	-0.01	1.54	-0.05	1.59	1.15	0.21	0.94	1.54	0.10	1.44	1.45	-0.05	1.50
	(16.62)	(10.59)	[-0.01]	(12.84)	(11.14)	[1.73]	(11.99)	(11.30)	[0.73]	(16.97)	(10.47)	[1.07]	(16.57)	(12.02)	[1.09]
RR	0.01	0.02		0.12	-0.00		0.10	0.02		0.09	0.01		0.09	-0.00	
SAAR	0.92	-0.60	1.52	1.42	0.09	1.33	1.23	0.15	1.09	1.31	-0.41	1.72	1.81	0.11	1.70
	(16.12)	(10.26)	[1.26]	(11.61)	(10.45)	[1.66]	(11.12)	(11.55)	[1.52]	(15.54)	(9.94)	[1.62]	(16.64)	(16.32)	[1.05]
Japan 6/90 – 6/2001															
AR	-0.29	-0.57	0.28	-0.01	-0.66	0.65	0.05	-0.40	0.45	-0.38	-0.49	0.10	-0.23	-0.45	0.22
	(6.64)	(6.54)	[0.76]	(5.76)	(6.90)	[1.77]	(5.82)	(6.76)	[1.27]	(7.16)	(6.28)	[0.29]	(6.13)	(6.16)	[0.59]
RR	-0.04	-0.86		-0.00	-0.10		0.01	-0.06		-0.05	-0.08		-0.04	-0.07	
SAAR	-0.43	-0.86	**0.43**	-0.35	-0.81	**0.46**	-0.34	-0.64	0.29	-0.56	-0.67	0.11	-0.41	-0.72	0.31
	(6.89)	(7.05)	**[2.17]**	(6.32)	(6.90)	**[2.31]**	(6.25)	(6.68)	[1.75]	(7.44)	(6.59)	[0.55]	(7.04)	(6.08)	[1.22]
Korea 6/93 – 6/2001															
AR	-0.62	0.09	-0.70	0.47	-0.65	1.12	0.69	-1.18	**1.87**	-0.03	-0.02	-0.01	-0.18	0.38	-0.56
	(12.44)	(12.39)	[-0.73]	(12.92)	(11.70)	[1.41]	(13.17)	(12.20)	**[2.13]**	(12.92)	(11.14)	[-0.01]	(11.58)	(12.64)	[-0.57]
RR	-0.05	0.01		0.04	-0.06		0.05	-0.10		-0.00	-0.00		-0.02	0.03	
SAAR	-0.27	-0.48	0.22	0.62	-0.93	**1.55**	0.75	-1.23	**1.97**	-0.26	-0.11	-0.15	0.04	-0.28	0.31
	(13.41)	(11.58)	[0.29]	(13.27)	(11.59)	**[2.32]**	(12.52)	(11.51)	**[2.76]**	(13.03)	(13.07)	[0.24]	(12.19)	(11.59)	[0.44]
Malaysia 6/93 – 6/2001															
AR	0.52	-0.37	0.88	0.60	-0.71	**1.31**	0.67	-0.26	0.93	0.04	-0.42	0.45	1.16	-0.60	**1.76**
	(14.27)	(9.97)	[1.21]	(11.67)	(11.08)	**[2.95]**	(11.50)	(10.83)	[1.82]	(13.27)	(10.23)	[0.72]	(11.42)	(11.52)	**[2.94]**
RR	0.04	-0.04		0.05	-0.06		0.06	-0.02		0.00	-0.04		0.10	-0.05	
SAAR	0.38	-0.72	**1.10**	0.70	-0.49	**1.19**	0.60	-0.09	**0.69**	-0.01	-0.32	0.31	0.87	-0.84	**1.71**
	(15.28)	(7.91)	**[2.25]**	(12.91)	(13.83)	**[3.66]**	(12.81)	(13.58)	**[2.04]**	(14.31)	(13.41)	[0.83]	(12.92)	(13.70)	**[4.37]**
Philippines 6/94 – 6/2001															
AR	-0.01	-0.41	0.40	-0.32	-0.57	0.25	-0.40	-0.79	0.39	-0.77	-0.50	-0.26	-0.01	-0.36	0.35
	(17.92)	(8.90)	[0.25]	(14.70)	(9.45)	[0.20]	(16.45)	(9.25)	[0.26]	(14.44)	(9.85)	[-0.21]	(12.95)	(9.80)	[0.30]
RR	-0.00	-0.05		-0.02	-0.06		-0.02	-0.09		-0.05	-0.05		-0.00	-0.04	
SAAR	-1.08	-0.83	-0.25	0.06	-1.04	1.10	-0.41	-0.85	0.44	-0.67	-0.74	0.07	0.04	-0.62	0.66
	(15.60)	(8.20)	(-0.18)	(13.00)	(8.21)	[1.17]	(13.10)	(7.66)	[0.40]	(11.79)	(9.17)	[0.08]	(12.67)	(8.91)	[0.57]
Singapore 6/90 – 6/2001															
AR	0.86	0.14	0.72	0.78	-0.17	0.95	0.85	0.08	0.77	0.63	0.19	0.44	0.51	-0.14	0.65
	(12.20)	(6.93)	[0.85]	(7.43)	(7.72)	[1.75]	(7.15)	(7.98)	[1.43]	(9.80)	(7.14)	[0.74]	(8.79)	(7.77)	[1.13]
RR	0.07	0.02		0.10	-0.02		0.12	0.01		0.06	0.03		0.06	-0.02	
SAAR	1.04	-0.13	1.17	0.82	-0.12	**0.94**	0.77	-0.05	**0.81**	0.57	0.71	-0.15	1.31	0.06	1.25
	(27.30)	(8.51)	[0.52]	(8.34)	(8.24)	**[3.03]**	(8.27)	(9.12)	**[2.59]**	(10.23)	(40.29)	[-0.04]	(33.24)	(8.62)	[0.44]
Taiwan 6/94 – 6/2001															
AR	-0.42	0.09	-0.09	0.46	-0.62	1.08	0.56	-1.11	**1.67**	0.11	0.19	-0.08	0.01	-0.37	0.38
	(8.88)	(9.80)	[0.67]	(8.59)	(9.30)	[1.59]	(9.32)	(10.13)	**[2.15]**	(8.41)	(9.66)	[-0.13]	(7.73)	(9.50)	[0.54]
RR	-0.05	0.01		0.05	-0.07		0.06	-0.11		0.01	0.02		0.00	-0.04	
SAAR	-0.77	-0.22	-0.54	0.10	-1.00	**1.10**	0.23	-0.78	1.01	-0.27	-0.47	0.21	-0.25	-0.38	0.13
	(9.10)	(9.27)	[-0.90]	(8.29)	(8.76)	**[2.50]**	(8.61)	(9.00)	[1.81]	(8.50)	(8.60)	[0.57]	(7.62)	(9.46)	[0.18]
Thailand 6/93 – 6/2001															
AR	-0.06	-0.91	0.85	-0.27	-0.75	0.48	0.54	-0.56	1.09	-0.12	-1.03	0.91	0.59	-0.72	1.31
	(15.55)	(12.49)	[0.75]	(14.39)	(11.14)	[0.58]	(14.87)	(11.67)	[1.19]	(10.73)	(11.65)	[0.90]	(13.85)	(10.90)	[1.31]
RR	-0.00	-0.07		-0.02	-0.07		0.04	-0.05		-0.01	-0.09		0.04	-0.06	
SAAR	-0.22	-0.87	0.65	0.24	-0.37	0.61	0.73	-0.16	0.88	0.42	-0.31	0.73	0.68	-0.25	0.93
	(15.42)	(8.82)	[0.56]	(12.15)	(8.36)	[0.92]	(11.87)	(9.76)	[1.09]	(11.39)	(9.46)	[0.86]	(12.70)	(8.26)	[1.11]

Notes for Table 4.3

Value and growth portfolios are formed on P/B, P/E, P/CF, P/Sales and P/D. Firms are weighted by their market capitalisation within each portfolio. We denote value (stocks in fractile 1) and growth (stocks in fractile 3) portfolios by V and G respectively and the difference between them V-G. V-G is in bold when statistically significant at 5% level.The first row for each country is the average monthly return (AR). The second is the standard deviation of monthly returns in (parentheses) or t – statistic testing whether V-G is different from zero in [brackets]. The third row is the risk adjusted rate of returns (RR) which is the ratio of AR to standard deviation of monthly returns. The fourth row is the size adjusted average monthly return (SAAR). The last row contains the standard deviation of size adjusted average monthly returns in (parentheses) or t – statistic testing whether V-G is different from zero in [brackets].

4.4.2.1 Consistency of Value-Growth Spreads Across Markets and Time

Table 4.4 summarises the consistency of the value premiums across markets and across time for market capitalisation weighted portfolios.

The results in Table 4.4 show that the value premiums using average monthly returns for portfolios weighted by market capitalisation are inconsistent with the results in Table 4.2. Table 3.4 shows that the frequency of positive value premiums that occur during the sample periods observed is significantly reduced compared to Table 4.2 with portfolios that are weighted equally. For example, the P/B (column 1) value premium for Hong Kong occurs 57% of the months observed for equally weighted portfolios compared to 42% of the months observed when the portfolios are weighted by market capitalisation. However, there are a few cases where portfolios weighted by market capitalisation have a higher frequency of positive value-growth spreads compared to equally weighted portfolios. E.g. Portfolios sorted on P/B, P/E, P/CF, P/Sales and P/D in Taiwan, portfolio sorted on P/D in Thailand and portfolios sorted on P/D and P/CF in Japan.

The story changes when average monthly returns are replaced with size adjusted average monthly returns. The number of portfolios with positive value-growth spreads that occur at a frequency of less than or equal to 50% of the months observed, has reduced to only 8 compared to 17 portfolios based on average monthly returns. Among these 8 portfolios are included portfolios based on P/Sales and P/D in Korea and based on P/B in Taiwan that have positive spreads taking place less than or equal to 50% of the periods observed using size adjusted average returns in Table 4.2. 65% of the portfolios observe an increase or no change in the frequency of positive value premium that takes place during months of negative stock market returns when size adjusted average monthly returns are used.

This provides plausible justification to the influence of the effects of size when market capitalisation weighting is used. Larger stocks that are more liquid suffer worse during periods of stock market decline. This is probably due to the fact that investors are usually long on large capitalisation stocks. During a downturn, the more 'heavily held' and liquid large capitalisation stocks (which are a proxy for the markets) face severe selling pressures and their price shows sharper declines compared to small capitalisation stocks. As a result, the frequency of positive value-growth spreads that occur in periods of stock market decline increases when market capitalisation weighted portfolios are constructed by controlling for the effect of firm size.

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Table 4.4 – Average Monthly and Size Adjusted Average Monthly Spreads for Market Capitalisation Weighted Portfolios

	P/B		P/E		P/CF		P/Sales		P/D	
	AR	SAAR	AR	SAAR	AR	SAAR	AR	SAAR	AR	SAAR
Hong Kong 6/90 – 6/2001										
Frequency of positive spreads	42%	49%	52%	64%	46%	54%	45%	52%	50%	58%
Frequency of positive spreads during positive stock market return months	44%	52%	51%	59%	40%	42%	34%	40%	37%	51%
Frequency of positive spreads during negative stock market return months	41%	46%	54%	71%	54%	68%	59%	68%	66%	68%
Indonesia 6/93 – 6/2001										
Frequency of positive spreads	49%	53%	50%	58%	55%	50%	52%	58%	50%	56%
Frequency of positive spreads during positive stock market return months	45%	60%	40%	51%	38%	47%	51%	62%	36%	53%
Frequency of positive spreads during negative stock market return months	53%	47%	59%	65%	71%	53%	53%	55%	63%	59%
Japan 6/90 – 6/2001										
Frequency of positive spreads	58%	64%	58%	62%	58%	58%	52%	56%	55%	57%
Frequency of positive spreads during positive stock market return months	50%	52%	45%	47%	42%	43%	52%	60%	43%	60%
Frequency of positive spreads during negative stock market return months	64%	75%	69%	75%	71%	71%	53%	53%	65%	54%
Korea 6/93 – 6/2001										
Frequency of positive spreads	47%	47%	55%	55%	56%	57%	48%	48%	48%	46%
Frequency of positive spreads during positive stock market return months	45%	45%	66%	64%	66%	68%	50%	52%	39%	34%
Frequency of positive spreads during negative stock market return months	48%	48%	46%	48%	48%	48%	46%	44%	56%	56%
Malaysia 6/93 – 6/2001										
Frequency of positive spreads	48%	60%	65%	65%	59%	59%	52%	54%	64%	70%
Frequency of positive spreads during positive stock market return months	54%	61%	54%	43%	50%	43%	57%	48%	46%	50%
Frequency of positive spreads during negative stock market return months	42%	60%	74%	84%	68%	74%	48%	60%	80%	88%
Philippines 6/94 – 6/2001										
Frequency of positive spreads	44%	48%	54%	56%	52%	54%	39%	48%	45%	55%
Frequency of positive spreads during positive stock market return months	36%	54%	46%	54%	56%	62%	36%	46%	38%	56%
Frequency of positive spreads during negative stock market return months	51%	47%	60%	58%	49%	47%	42%	49%	51%	53%
Singapore 6/90 – 6/2001										
Frequency of positive spreads	50%	55%	55%	58%	51%	56%	51%	53%	55%	61%
Frequency of positive spreads during positive stock market return months	55%	58%	48%	47%	38%	41%	53%	55%	47%	49%
Frequency of positive spreads during negative stock market return months	44%	51%	64%	73%	66%	75%	47%	44%	64%	76%
Taiwan 6/94 – 6/2001										
Frequency of positive spreads	48%	44%	60%	55%	64%	62%	55%	57%	55%	51%
Frequency of positive spreads during positive stock market return months	39%	34%	53%	53%	63%	58%	53%	53%	47%	47%
Frequency of positive spreads during negative stock market return months	54%	52%	65%	57%	65%	65%	57%	61%	61%	54%
Thailand										
Frequency of positive spreads	57%	55%	51%	56%	58%	56%	49%	56%	58%	56%
Frequency of positive spreads during positive stock market return months	46%	61%	54%	59%	59%	63%	26%	61%	48%	54%
Frequency of positive spreads during negative stock market return months	68%	50%	48%	54%	58%	50%	70%	52%	68%	58%

Notes for Table 4.4

Value(stocks in fractile 1) and growth(stocks in fractile 3) portfolios are formed on P/B, P/E, P/CF, P/Sales and P/D. Firms are weighted by their market capitalisation within each portfolio. Value-growth spreads are computed using average monthly return (AR) as well as size adjusted average monthly return (SAAR).

4.4.3 Small-firm Effect

Our results show evidence that the superiority of the value strategy in the Asian Equity Markets may be attributable to the small-firm effect. We further examine the relationship between valuation ratios, firm size and stock returns in order to determine which effect is more predominant in explaining cross-sectional stock returns.

The results in Tables 4.5-4.8 show that there is a relationship between firm size and valuation ratios as postulated by Basu (1983) and Fama and French (1992). The results are based on returns on equally weighted and market capitalisation weighted portfolios. These portfolios are constructed by controlling for the effect of firm size and valuation ratio in this case P/B and P/E ratios.

The results in Tables 4.5-4.8 show that the strength of P/B and P/E ratio seems to vary inversely with firm size. More specifically both P/B and P/E effect become weaker as one moves from the smallest size asset class to the largest. The value premiums are smaller in Size 3 (largest) class compared to Size 1 (smallest) class. When returns are controlled for differences in P/B, P/E ratio, the results show abnormal returns between small size firms and large size firms and the spreads are generally larger within the lowest P/B and P/E groups.

The results are consistent with those of Fama & French (1992) and Basu (1983) – controlling for size, both P/B and P/E capture substantial variation in cross-section of average stock returns. However, both Fama and French and Basu showed that the effect of firm size is of secondary importance when compared to both P/B and P/E ratios. Our results instead show that the effect of firm size remains just as important as P/B and P/E ratios. Our results confirm that both valuation ratios and firm size play a simultaneous role in explaining cross-sectional average stock returns in the Asian Equity Markets.

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Table 4.5 – Average Monthly Returns for Equally Weighted Portfolios Formed on P/B and Size

Hong Kong	**Size 1**	**Size 2**	**Size 3**	**Spread**
Value	2.17	0.96	0.94	1.24
Middle	1.31	0.32	0.84	0.47
Growth	0.32	0.20	0.86	-0.54
Spread	**1.85**	**0.76**	**0.07**	
Indonesia	**Size 1**	**Size 2**	**Size 3**	**Spread**
Value	3.76	0.98	0.03	3.74
Middle	2.26	0.49	0.42	1.84
Growth	-0.58	-0.07	-0.39	0.19
Spread	**4.34**	**1.05**	**0.42**	
Japan	**Size 1**	**Size 2**	**Size 3**	**Spread**
Value	-0.25	-0.43	-0.24	-0.02
Middle	-0.51	-0.68	-0.29	-0.22
Growth	-0.82	-0.94	-0.62	-0.19
Spread	**0.56**	**0.51**	**0.39**	
Korea	**Size 1**	**Size 2**	**Size 3**	**Spread**
Value	1.14	-0.44	-1.13	2.27
Middle	0.19	-0.36	0.20	-0.01
Growth	-0.81	-0.59	-0.67	-0.14
Spread	**1.95**	**0.15**	**-0.46**	
Malaysia	**Size 1**	**Size 2**	**Size 3**	**Spread**
Value	0.83	0.40	0.62	0.21
Middle	0.43	-0.20	0.16	0.27
Growth	-0.10	-1.16	-0.32	0.22
Spread	**0.93**	**1.56**	**0.94**	
Philippines	**Size 1**	**Size 2**	**Size 3**	**Spread**
Value	2.68	0.31	-3.30	5.98
Middle	-0.34	-1.07	-0.75	0.42
Growth	-0.58	-1.37	-0.52	-0.06
Spread	**3.26**	**1.68**	**-2.78**	
Singapore	**Size 1**	**Size 2**	**Size 3**	**Spread**
Value	2.62	0.67	0.11	2.51
Middle	1.23	0.12	0.51	0.72
Growth	-0.57	0.25	0.17	-0.74
Spread	**3.19**	**0.42**	**-0.06**	
Taiwan	**Size 1**	**Size 2**	**Size 3**	**Spread**
Value	-1.22	-0.83	-0.26	-0.96
Middle	-0.39	-0.65	0.26	-0.65
Growth	-0.28	-0.50	-0.31	0.03
Spread	**-0.94**	**-0.33**	**0.05**	
Thailand	**Size 1**	**Size 2**	**Size 3**	**Spread**
Value	2.04	0.14	-1.34	3.38
Middle	0.48	-0.13	-0.21	0.69
Growth	-0.16	-0.82	-1.28	1.12
Spread	**2.20**	**0.96**	**-0.06**	

Notes for Table 4.5

Firms are sorted into 3 fractiles each based on P/B and size. Firms are weighted equally within each portfolio. 9 portfolios are formed from the intersection of 3 P/B and 3 size portfolios. Spread of returns is examined between V (smallest P/B) and G (highest P/B) portfolios across each size group and between Size 1 (smallest) and Size 3 (largest) portfolios across each P/B group.

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Table 4.6 – Average Monthly Returns for Market Capitalisation Weighted Portfolios Formed on P/B and Size

Hong Kong	Size 1	Size 2	Size 3	Spread
Value	1.23	0.80	0.93	0.31
Middle	0.56	0.29	1.07	-0.52
Growth	-0.63	0.40	1.37	-2.00
Spread	**1.86**	**0.40**	**-0.44**	
Indonesia	**Size 1**	**Size 2**	**Size 3**	**Spread**
Value	2.73	0.74	-0.73	3.46
Middle	2.26	0.04	0.87	1.39
Growth	-1.82	-0.21	0.22	-2.04
Spread	**4.55**	**0.95**	**-0.95**	
Japan	**Size 1**	**Size 2**	**Size 3**	**Spread**
Value	-0.47	-0.58	-0.25	-0.22
Middle	-0.64	-0.78	-0.09	-0.55
Growth	-1.11	-0.93	-0.54	-0.56
Spread	**0.63**	**0.35**	**0.29**	
Korea	**Size 1**	**Size 2**	**Size 3**	**Spread**
Value	1.09	-0.86	-1.02	2.11
Middle	0.03	-0.60	0.50	-0.47
Growth	-1.34	-0.36	0.25	-1.59
Spread	**2.43**	**-0.50**	**-1.27**	
Malaysia	**Size 1**	**Size 2**	**Size 3**	**Spread**
Value	0.28	0.16	0.69	-0.41
Middle	-0.09	-0.36	0.18	-0.27
Growth	-0.42	-1.43	-0.32	-0.10
Spread	**0.70**	**1.58**	**1.01**	
Philippines	**Size 1**	**Size 2**	**Size 3**	**Spread**
Value	0.73	-0.17	-3.81	4.53
Middle	-0.90	-1.43	-1.50	0.60
Growth	-1.34	-0.77	-0.40	-0.94
Spread	**2.06**	**0.60**	**-3.41**	
Singapore	**Size 1**	**Size 2**	**Size 3**	**Spread**
Value	2.40	0.53	0.19	2.21
Middle	0.73	0.09	0.57	0.16
Growth	-0.69	0.17	0.14	-0.83
Spread	**3.09**	**0.37**	**0.05**	
Taiwan	**Size 1**	**Size 2**	**Size 3**	**Spread**
Value	-1.29	-0.74	-0.28	-1.01
Middle	-0.44	-0.63	0.46	-0.90
Growth	-0.45	-0.40	0.17	-0.61
Spread	**-0.85**	**-0.34**	**-0.45**	
Thailand	**Size 1**	**Size 2**	**Size 3**	**Spread**
Value	1.69	-0.02	-2.34	4.02
Middle	1.30	-0.38	-0.94	2.25
Growth	-0.93	-0.84	-0.85	-0.08
Spread	**2.62**	**0.82**	**-1.49**	

Notes for Table 4.6

Firms are sorted into 3 fractiles each based on P/B and size. Firms are weighted by their market capitalisation within each portfolio. 9 portfolios are formed from the intersection of 3 P/B and 3 size portfolios. Spread of returns is examined between V (smallest P/B) and G (highest P/B) portfolios across each size group and between Size 1 (smallest) and Size 3 (largest) portfolios across each P/B group.

Chapter 4 – To Test the Predictability of Asian Stock Returns

Table 4.7 – Average Monthly Returns for Equally Weighted Portfolios Formed for P/E and Size

Hong Kong	**Size 1**	**Size 2**	**Size 3**	**Spread**
Value	1.30	0.89	0.86	0.45
Middle	0.57	0.78	1.35	-0.78
Growth	0.20	0.41	0.72	-0.52
Spread	**1.11**	**0.47**	**0.14**	
Indonesia	**Size 1**	**Size 2**	**Size 3**	**Spread**
Value	2.36	1.26	1.61	0.75
Middle	3.03	-0.33	-0.05	3.08
Growth	0.37	-0.24	-1.06	1.44
Spread	**1.99**	**1.50**	**2.68**	
Japan	**Size 1**	**Size 2**	**Size 3**	**Spread**
Value	-0.39	-0.54	-0.15	-0.24
Middle	-0.46	-0.63	-0.23	-0.23
Growth	-0.73	-0.76	-0.68	-0.06
Spread	**0.34**	**0.22**	**0.52**	
Korea	**Size 1**	**Size 2**	**Size 3**	**Spread**
Value	1.85	0.46	-0.09	1.94
Middle	0.27	0.21	-0.68	0.95
Growth	-1.03	-0.62	-0.52	-0.51
Spread	**2.88**	**1.08**	**0.43**	
Malaysia	**Size 1**	**Size 2**	**Size 3**	**Spread**
Value	1.50	0.71	0.42	1.08
Middle	0.26	-0.09	0.22	0.05
Growth	0.49	-0.69	-0.46	0.95
Spread	**1.01**	**1.40**	**0.88**	
Philippines	**Size 1**	**Size 2**	**Size 3**	**Spread**
Value	2.95	0.39	0.03	2.92
Middle	-0.41	-0.64	-0.29	-0.12
Growth	-0.13	-1.32	-0.61	0.48
Spread	**3.08**	**1.71**	**0.64**	
Singapore	**Size 1**	**Size 2**	**Size 3**	**Spread**
Value	1.25	0.88	0.71	0.54
Middle	2.74	0.37	0.44	2.30
Growth	0.24	-0.18	-0.03	0.27
Spread	**1.01**	**1.06**	**0.74**	
Taiwan	**Size 1**	**Size 2**	**Size 3**	**Spread**
Value	-0.10	-0.65	0.43	-0.53
Middle	-0.87	-0.02	0.12	-0.99
Growth	-1.57	-0.70	-0.71	-0.86
Spread	**1.47**	**0.04**	**1.14**	
Thailand	**Size 1**	**Size 2**	**Size 3**	**Spread**
Value	1.87	-0.20	0.14	1.73
Middle	1.26	-0.69	-0.07	1.32
Growth	0.70	-0.90	-1.43	2.13
Spread	**1.17**	**0.70**	**1.57**	

Notes for Table 4.7

Firms are sorted into 3 fractiles each based on P/E and size. Firms are weighted equally within each portfolio. 9 portfolios are formed from the intersection of 3 P/E and 3 size portfolios. Spread of returns is examined between V (smallest P/E) and G (highest P/E) portfolios across each size group and between Size 1 (smallest) and Size 3 (largest) portfolios across each P/B group.

Table 4.8 – Average Monthly Returns for Market Capitalisation Weighted Portfolios Formed on P/E and Size

Hong Kong	**Size 1**	**Size 2**	**Size 3**	**Spread**
Value	1.09	0.89	1.06	0.02
Middle	0.10	0.90	1.74	-1.64
Growth	-0.41	0.12	0.99	-1.40
Spread	**1.49**	**0.77**	**0.07**	
Indonesia	**Size 1**	**Size 2**	**Size 3**	**Spread**
Value	1.90	1.33	1.04	0.86
Middle	3.25	-0.71	0.80	2.45
Growth	0.70	-0.47	0.05	0.64
Spread	**1.21**	**1.80**	**0.99**	
Japan	**Size 1**	**Size 2**	**Size 3**	**Spread**
Value	-0.56	-0.57	0.08	-0.64
Middle	-0.63	-0.71	0.03	-0.66
Growth	-0.96	-0.84	-0.64	-0.32
Spread	**0.40**	**0.27**	**0.72**	
Korea	**Size 1**	**Size 2**	**Size 3**	**Spread**
Value	1.30	0.11	0.44	0.86
Middle	-0.01	0.16	0.09	-0.09
Growth	-1.42	-0.76	-0.62	-0.80
Spread	**2.72**	**0.87**	**1.06**	
Malaysia	**Size 1**	**Size 2**	**Size 3**	**Spread**
Value	0.98	0.61	0.50	0.48
Middle	-0.27	-0.15	0.16	-0.43
Growth	0.09	-0.79	-0.77	0.86
Spread	**0.89**	**1.40**	**1.27**	
Philippines	**Size 1**	**Size 2**	**Size 3**	**Spread**
Value	0.83	-0.22	-0.42	1.25
Middle	-0.8	-0.48	-0.35	-0.45
Growth	-1.44	-1.15	-0.52	-0.92
Spread	**2.27**	**0.93**	**0.10**	
Singapore	**Size 1**	**Size 2**	**Size 3**	**Spread**
Value	1.03	0.73	0.68	0.35
Middle	2.57	0.25	0.56	2.01
Growth	-0.02	-0.23	-0.12	0.11
Spread	**1.05**	**0.96**	**0.81**	
Taiwan	**Size 1**	**Size 2**	**Size 3**	**Spread**
Value	0.00	-0.38	0.66	-0.66
Middle	-0.93	0.08	0.02	-0.94
Growth	-1.57	-0.97	-0.48	-1.09
Spread	**1.57**	**0.59**	**1.14**	
Thailand	**Size 1**	**Size 2**	**Size 3**	**Spread**
Value	1.88	-0.52	-0.65	2.53
Middle	0.40	-0.65	-0.25	0.65
Growth	0.53	-0.93	-0.72	1.25
Spread	**1.35**	**0.41**	**0.08**	

Notes for Table 4.8

Firms are sorted into 3 fractiles each based on P/E and size. Firms are weighted by their market capitalisation within each portfolio. 9 portfolios are formed from the intersection of 3 P/E and 3 size portfolios. Spread of returns is examined between V (smallest P/E) and G (highest P/E) portfolios across each size group and between Size 1 (smallest) and Size 3 (largest) portfolios across each P/E group.

4.4.4 Conclusion

The cross-sectional relationship between stock returns and valuation ratios has been extensively researched in the developed western markets but relatively little research has been published for the Asian Equity Markets.

Our study explores the relationship between the stock returns in the Asian Equity Markets and valuation ratios such as P/B, P/E, P/CF, P/Sales and P/D. We provide a comprehensive update and some new evidence on the performance of value and growth strategies based on a number of markets in both developed and emerging Asia.

Our findings show that stock returns in the Asian Equity Markets are predictable. Value stocks consistently outperform growth stocks over the sample period. There is a significant cross-sectional relationship between commonly used valuation ratios such as P/B, P/E, P/CF, P/Sales and P/D and stock returns. The performance of the price-to-earnings (P/E) ratio is especially noteworthy. The P/E ratio is statistically and economically the most important of the five ratios investigated. Although reported earnings after tax is usually a 'noisy' ratio and prone to distortions; the results of our study provides evidence that P/E ratio has a high predictive power on the average stock returns in the Asian Equity Markets. We highlight a number of reasons that may reflect the importance of P/E ratio as a predictor of returns such as:

- As Asia undergoes restructuring in its corporate and financial structures (driven in part by maturing capital markets) there is a growing shift in focus amongst corporate towards profitability
- The investor mindset is also changing with a renewed focus towards sustainable profitability
- P/E is a popular ratio (widely available and easily understood by analysts and retail investors alike). EPS forecasts are widely used as a proxy for future profitability as well as risk
- Reported EPS figures are updated quarterly and forecasts are easily available compared to other variables e.g. Book value, sales, cash flow etc
- P/E ratio allows easy comparison across stocks because it is easily available and simple to understand
- P/E reflects the market perceptions and moods for a country, sector or stock

Our results are in contrast to earlier academic studies by Fama and French (1998) and Chan et al (1991) conducted on both the developed and emerging Asian markets which show P/B ratio as having the most significant and consistent impact on expected stock returns. This highlights that there is no guarantee that relationships uncovered from historical data may prevail in the future as markets and their institutional frameworks go through structural changes.

Our results provide evidence that value strategies in Asian Equity Markets earn higher risk adjusted returns compared to growth strategies. The results do not agree with the rational, efficient pricing theory in equity markets that supports the risk-based argument by Fama and French (1995,1996) behind the superior returns of value strategies. If value strategy is fundamentally riskier, then it should underperform relative to growth strategy during undesirable states of the world when the marginal utility of wealth is high. Down-market months of the stock market correspond to periods when aggregate wealth is low and thus utility of an extra dollar is high. Our results show that value stocks consistently outperform growth stocks at a frequency of more than 50% of the months observed.

Closer examination shows that positive value-growth spread is skewed towards periods when the stock market performance is negative. The frequency of positive value-growth spreads during periods of stock market decline is higher than the frequency observed during periods of positive performance of the stock market. For example, Hong Kong value-growth spread sorted on P/E is positive 48% of the months during periods of positive stock market returns but 76% of the months during periods of negative stock market returns. We also observe that the outperformance of value stocks over growth stocks is more pronounced during the Asian crisis. Although value stocks were negatively affected during the Asian crisis, they recovered dramatically compared to growth stocks. This is noted for companies with sound fundamentals supported by certainty in earnings, cashflow and dividend payments which do not justify their extreme low valuation levels exacerbated by the negative sentiment during the crisis period.

Our results are consistent with the conclusions by Lakonishok, Shleifer and Vishny (1994) which show that when the stock market performance is negative, value stocks outperform and the outperformance is more pronounced during the worst twenty-five months of the stock market performance. In conclusion, the results of our studies do not agree with the view that the risk-based argument by Fama and French provides an explanation behind the superior performance of value strategies.

On the other hand, our results for equally weighted portfolios show evidence that the superior performance of value strategies in the Asian Equity Markets may be attributable to the small-firm effect. The value-growth spreads are reduced when portfolios are controlled for the effect of firm size. Nonetheless, the majority of the spreads remain significant even after controlling for the effect of firm size. The small-firm effect is apparent in Asia particularly in the smaller emerging Asian markets like Indonesia and Thailand. These markets are dominated by a few large capitalisation stocks, amongst numerous small capitalisation stocks. The large capitalisation stocks have higher liquidity and are often regarded as proxy stocks for the markets. The influence of small-firm effect is confirmed when a similar analysis is conducted on market capitalisation weighted portfolios. We find that the value-growth spreads for market capitalisation portfolios are statistically not significant at both the 5% and 10% levels but the results are reversed when the portfolios are controlled for the effect of firm size. We further observe that the influence of size-based effect is more apparent in the performance of growth portfolios when they are weighted by market capitalisation. Typically, we find that the few liquid large capitalisation stocks that are regarded as proxy stocks for the market are widely held and attract the bulk of fund flows into the markets. As a result these few large capitalisation stocks that dominate the local markets tend to have high valuation multiples and fall under the classification of 'growth' stocks. We thus, find that the returns of the market capitalisation weighted growth stocks when controlled for the effect of firm size are reduced highlighting the dominance of large capitalisation stocks in these markets.

Further analysis reveals that there is an interaction between firm size and valuation ratios as postulated by Basu (1983) and Fama and French (1992). Controlling for size, both P/B and P/E capture substantial variation in cross-section of average stock returns in the Asian Equity Markets and within each P/B and P/E groups, average returns are related to size. Strength of P/B and P/E ratio seems to vary inversely with firm size. More specifically, the results show that P/B and P/E effect becomes weak as one move from the smallest size asset class to the largest. When returns are controlled for differences in P/B, P/E ratio, the results show abnormal returns between small size firms and large size firms and the spreads are generally larger within the lowest P/B and P/E groups.

Whilst Basu (1983) showed that size effect disappeared when returns were controlled for differences in P/E ratios, our results instead show that the effect of firm size remain important and is not of secondary importance when compared to both P/B and P/E ratios. Our study confirms that both valuation ratios and firm size are key determinants in the explanation behind the cross-sectional average stock returns in the Asian Equity Markets.

Chapter 5
Fundamental Drivers of Value and Growth Stocks

Chapter 5 – Fundamental Drivers of Value and Growth Stocks

Chapter 5 – Fundamental Drivers of Value and Growth Stocks

5.1 Objective

The purpose of this chapter is two-fold:

i) To investigate the significance of the theoretical drivers which explain the variability of valuation ratios (such as P/B - price to book ratio, P/E - price to earnings ratio, P/Sales - price to sales ratio and P/D- inverse of dividend yield) which are used as proxies for classifying value and growth stocks.

ii) We investigate whether an investment strategy which uses the combination of theoretical drivers based on historical data or a mix of historical and forecasts data is a better predictor of future returns of value and growth stocks as compared to an investment strategy which uses valuation ratios based on single factor variables (such as P/B, P/E, P/Sales and P/D). We also determine whether the above strategy based on theoretical drivers exceeds the performance of commonly used benchmarks such as MSCI/Citigroup Indices.

Single factor valuation ratios which are influenced by the dynamic 'Price' factor reflect market perceptions about the future values of the underlying drivers which can be either over-optimistic or over-pessimistic. As a result, the single factor valuation ratios create mispricing in the market for both value and growth stocks

5.2 Motivation

Traditionally, value and growth stocks tend to be classified using valuation ratios such as P/B, P/E, P/Sales and P/D. Stocks with low values for P/B, P/E, P/Sales and P/D ratios are classified as value stocks and vice versa for growth stocks. Since low values for these ratios often result from low stock prices (as the stock price is a numerator in the ratio), then value stocks are often considered cheap stocks while growth stocks are considered expensive stocks regardless of their expected growth prospects. Hence, in a bear market when stock prices are in the doldrums – growth stocks will tend to be ignored in favour of value stocks. Therefore, investors using single factor valuation ratios to formulate investment strategies will potentially lose opportunities to invest in promising growth stocks

The definition of valuation ratios such as P/B, P/E, P/Sales and P/D are more complex than most investors realise. Valuation ratios are driven by company specific fundamentals such as risk profile, growth rate, payout ratios as shown in the equations in Section 5.3 of Chapter 5. As a result concluding that Firm A is undervalued just because its P/E ratio is lower than Firm B may be wrong. This is because even if Firm A and Firm B have similar expected growth rates; Firm A could have a higher risk profile than Firm B and consequently a lower P/E ratio compared to Firm B.

Recently a number of style indices have been created using a combination of value and growth factors for the classification of the respective indices. (e.g. Citigroup uses a combination of 5 year historical earnings per share growth rate, 5 years historical sales per share growth rate and 5 year historical internal growth rate for the classification of their Growth Index and a combination of P/B, P/CF, P/Sales and P/D for the classification of their Value Index).

We know from empirical research that the selection of a combination of fundamental variables for classifying value and growth stocks has been traditionally guided more by intuition and by their popularity among practitioners than by any explicit theoretical models. We therefore investigate the significance of the theoretical drivers behind the valuation ratios. We also determine whether the combination of theoretical drivers based on historical data or a mix of historical and forecast data can exceed the performance of the single factor valuation ratios influenced by the 'Price' factor. The Price factor is driven by market expectations and investor behaviour which may be overly optimistic or pessimistic. The price factor is not completely driven by fundamentals but to a large extent by subjective judgement which may include 'herd behaviour'. Therefore, we examine whether an investment strategy based on fundamental drivers using either historical data or a mix of historical and forecast data produces better investment performance for both value and growth stocks. Currently, even sophisticated investors formulate investment strategies based on single factor valuation ratios as they are widely available.

5.3 Hypotheses

Hypothesis I: Valuation ratios (such as P/B, P/E, P/Sales and P/D) which are used as proxies for value and growth stocks are determined by company specific fundamentals, expectations of growth and historical price performance.

The variables behind the proxies are identified using Gordon's Growth Model.

Using Gordon's Growth Model based on the dividend discount model, the price per share of a stable firm is defined as below:

$$P_0 = \frac{DPS_1}{r - g_n} \rightarrow \text{equation 5.1}$$

$$= \frac{DPS_0 \times (1+g_n)}{r - g_n}$$

where:

P_0 = Price per share (current year)

DPS_1 = Expected dividends per share next year

DPS_0 = Dividend per share (current year)

r = Required rate of return on equity

g_n = Growth rate in dividends (forever)

$$\Rightarrow P_0 / DPS_0 = P / D = \frac{(1+g_n)}{r - g_n}$$

$$\Rightarrow \text{Dividend yield} = D / P = \frac{r - g_n}{(1+g_n)}$$

Equation 5.1 can be rewritten as:

$$P_0 = \frac{EPS_0 \times \text{Payout Ratio} \times (1+g_n)}{r - g_n} \rightarrow \text{equation 5.2}$$

where:

EPS_0 = Earnings per share (current year)

DPS_1 = $EPS_0 \times$ Payout Ratio $\times (1+g_n)$

Equation 5.2 can be rewritten as:

$$P_0/EPS_0 = P/E = \frac{\text{Payout Ratio} \times (1+g_n)}{r - g_n}$$

$$\Rightarrow P/E = \frac{\text{Payout Ratio} \times (1+g_n)}{r - g_n}$$

Similarly equation 5.2 can be expressed as follows:

$$P_0 = \frac{BV_0 \times ROE \times \text{Payout Ratio } (1+g_n)}{r - g_n} \rightarrow \text{equation 5.3}$$

where:

BV_0 = Book Value per share (current year)

ROE = Return on equity

$= EPS_0/BV_0$

Similarly equation 5.3 can be expressed as follows:

$$P_0/BV_0 = P/B = \frac{ROE \times \text{Payout Ratio} \times (1+g_n)}{r - g_n}$$

$$\Rightarrow P/B = \frac{ROE \times \text{Payout Ratio} \times (1+g_n)}{r - g_n}$$

Equation 5.2 can also be expressed as follows:

$$P_0 = \frac{Sales_0 \times \text{Net Profit Margin} \times \text{Payout Ratio } (1+g_n)}{r - g_n} \rightarrow \text{equation 5.4}$$

where:

$Sales_0$=Sales per share (current year)

$$\text{Net Profit Margin} = {EPS_0}/{\text{Sales per share}}$$

Similarly equation 5.4 can be expressed as follows:

$$P_0/Sales_0 = P/Sales = \frac{\text{Net Profit Margin} \times \text{Payout Ratio } (1+g_n)}{r - g_n}$$

$$\Rightarrow P/Sales = \frac{\text{Net Profit Margin} \times \text{Payout Ratio } (1+g_n)}{r - g_n}$$

The equations above can be simplified as follows:

Equation 5.1:

$$P/B = \alpha + \beta_1 Risk + \beta_2 \text{Growth Rate} + \beta_3 \text{Payout Ratio} + \beta_4 ROE$$

Equation 5.2:

$$P/E = \alpha + \beta_1 Risk + \beta_2 \text{Growth Rate} + \beta_3 \text{Payout Ratio}$$

Equation 5.3:

$$P/Sales = \alpha + \beta_1 Risk + \beta_2 \text{Growth Rate} + \beta_3 \text{Payout Ratio} + \beta_4 \text{ Net Profit Margin}$$

Equation 5.4:

$$P/D = \alpha + \beta_1 Risk + \beta_2 \text{Growth Rate}$$

where;

risk	=	beta, Net Debt/Equity;
growth rate	=	investors' expectations of future growth. This is measured by IBES Consensus Mean FY 1 earnings growth forecast, past 1 year actual earnings growth rate, past 1 year actual sales growth rate, historical 1 year price performance

Specifically as observed in the above equations, the variability in P/B ratio is driven by company specific fundamentals such as risk, expectations of growth, payout ratio and return on equity. We use two forms of expectations of growth:

- analysts forecasts (Forecast growth)
  IBES Consensus Mean FY1 earnings growth rate is used as it represents the industry proxy for forecasts of future growth opportunities of a company.

- extrapolation of past earnings and sales growth rates (Past growth)
  There is evidence that investors and analysts form expectations of the future by extrapolating the past. Both past 1 year sales growth and past 1 year earnings growth rates are used.

The drivers behind the variability in the proxies for value and growth stocks contain both growth and value characteristics. This establishes the reason behind the common use of valuation ratios such as P/B, P/E, P/Sales and dividend yield as the industry proxy for defining and measuring value and growth styles.

Value characteristics are observed as the variables which capture the relationship between the intrinsic value of a company and its current value. Studies by Lakonishok et al (1994) and Debondt and Thaler (1985,1987) have shown that extrapolation of past performance to expectations of future performance leads to expectational error because growth rates mean-revert. Perhaps, value characteristics based on a combination of company specific fundamentals relying on historical data exploits the mis-pricing in stocks caused by expectational error.

Growth characteristics are observed as the variables which predict future growth prospects of a company. Perhaps, the growth characteristics using a combination of company specific fundamentals relying on expectations of growth works on the premise that markets are eventually efficient and corporate performance will be reflected in stock price performance.

Chapter 5 – Fundamental Drivers of Value and Growth Stocks

Hypothesis II: The cross-sectional explanatory power of company specific fundamentals and historical price performance vary across countries and across time periods.

Hypothesis III: An investment strategy which uses a combination of theoretical drivers based on historical data or a mix of historical and forecasts data is a better predictor of future returns of value and growth stocks compared to an investment strategy which purely uses single factor variable valuation ratios (such as P/B, P/E, P/Sales and P/D). The strategy based on theoretical drivers also exceeds the performance of style benchmarks such as MSCI/Citigroup Indices.

As mentioned, the single factor variable valuation ratios (such as P/B, P/E, P/Sales and P/D) are influenced by the 'Price' factor which reflects the market's expectations of the underlying fundamental variables which may be biased optimistically or pessimistically.

The theoretical drivers as derived from Equations 5.1 - 5.4 are as follows:

- expectations of growth based on analysts forecasts (IBES Consensus Mean FY1 earnings growth forecasts) – forecast data
- expectations of growth based on past 1 year earnings/sales growth rate – historical data
- sustainable long-term growth rate of a company (ROE and Payout Ratio) – historical data
- risk (Beta, Net Debt to Equity ratio) – historical data
- historical price performance – historical data

Studies have shown that expectational errors cause a certain degree of mis-pricing. This makes value stocks to be underpriced and growth stocks to be overpriced. It is the correction of of mis-pricing of growth opportunities that explains the superior return of value stocks over growth stocks.

Hence, for a value investor to capture the maximum potential upside of the price performance for value stocks, the issue of entry point of the holding period is important.

The inclusion of historical price performance as an additional fundamental variable to historical data helps better capture the relationship between the intrinsic value of a company and its current price. This relationship helps better address whether a company is valued below or above its intrinsic value. A value investor relies on the underestimation of the current value of a stock to drive its share price higher. Thus, the 'Price' element is important in the specification for value stocks. The combination of the use of expectations of growth based on extrapolation of past performance and 'price entry point' exploits the mis-pricing in stocks caused by expectational error.

5.4 Methodology for testing Hypotheses and Regression Methods Used

5.4.1 Methodology for Testing Hypotheses

Our methodology is divided into three stages:
Stage 1: We examine the statistical significance of the theoretical drivers which explain ratios (which are used as proxies for classifying value and growth stocks).

The regression uses the Seemingly Unrelated Regression (SUR) method in each country across its sample periods. The regression methods are explained in greater detail in this in Section 5.4.2.

There are two alternatives for the regressions:

- restricted option (coefficients remain constant across time)
- unrestricted option (coefficients vary across time)

Before we test Hypothesis I, we perform preliminary tests on the restricted and unrestricted options for the regressions to determine the preferred option.

Stage 2: We examine whether an investment strategy which uses the combination of theoretical drivers based on historical data or a mix of historical and forecast data is a better predictor of future returns of value and growth stocks compared to an investment strategy which uses single factor valuation ratios such as P/B, P/E, P/Sales and P/D.
We also check whether the strategy based on theoretical drivers outperforms benchmark indices such as MSCI/Citigroup Indices.

Stage 3: In order to achieve this, a 'multi-factor composite valuation' criteria is then formed using the theoretical drivers to estimate the value of the respective valuation ratios. The weights used in the 'multi-factor composite' valuation criteria are based on the estimated coefficients generated from the multi-variate cross-sectional regressions (using results of Stage I). Then portfolios are constructed and returns of the portfolios are examined as explained below in the section under 'Formation of Portfolios Based on Multi-factor Composite Criteria'.

5.4.2 Regression Methods Used for Testing Hypotheses

The Seemingly Unrelated Regression (SUR) method is employed to determine the parameters in the system of equations across time. The SUR is chosen as its estimation method accounts for heteroskedasticity and contemporaneous correlation in the errors across equations. Heteroskedasticity and contemporaneous correlation are typical phenomenon in a system of equations across time that uses company specific variables that tend to exhibit serial correlation.

We conduct a preliminary investigation on the residuals to see whether they exhibit contemporaneous correlation using OLS regressions. For the purpose of this investigation we make use of the residuals from the regressions on P/B against variables identified in Model C. (Further details on Models A, B and C are discussed later in this section)

Table 5.1 below shows the correlation coefficients between residuals at time t and time t+1 for the 9 countries over the sample period in time.

Table 5.1 - Correlation Coefficients between Residuals at time t and time t+1 using OLS Regressions

Years	Hong Kong	Indonesia	Japan	Korea	Malaysia	Philippines	Singapore	Thailand	Taiwan
95/96	0.63	0.58	0.78	0.73	0.84	0.58	0.76	0.68	0.84
96/97	0.66	0.77	0.77	0.77	0.65	0.81	0.70	0.65	0.65
97/98	0.49	0.40	0.70	0.61	0.60	0.70	0.70	0.61	0.61
98/99	0.61	0.66	0.74	0.50	0.72	0.53	0.60	0.73	0.64
99/00	0.58	0.60	0.69	0.64	0.65	0.70	0.70	0.64	0.80
00/01	0.66	0.67	0.60	0.65	0.67	0.94	0.70	0.72	0.80

The preliminary evidence above shows that the residuals computed from OLS regressions do exhibit contemporaneous correlation. This thus justifies the use of SUR regressions.

As discussed above three different models of regressions are conducted for each dependent variable:

Model A- growth rate that uses IBES Consensus Mean FYI earnings growth forecasts

Model B- growth rates that uses 1 year past earnings growth and 1 year past sales growth

Model C- growth rates that uses 1 year past earnings growth and 1 year past sales growth as in Model B plus 1 year historical price performance

There are two alternatives for the regressions:

- restricted option (coefficients remain constant across time)
- unrestricted option (coefficients vary across time)

As discussed earlier, before we test the hypotheses, we perform preliminary tests to determine the preferred option : restricted versus unrestricted option.

We show two types of equations, namely the unrestricted (coefficients vary across time) and restricted (coefficient remains constant across time) options as shown below in Example I which uses Model A based on P/B as the dependent variable.

Example I (Model A based on P/B as dependent variable)

Unrestricted Option = 60 regressors

```
PB_90 = c(1)+c(2)*netdebtequity_90+c(3)*beta_90+c(4)*IBES_90+c(5)*payout_90+c(6)*ROE_90
PB_91 = c(7)+c(8)*netdebtequity_91+c(9)*beta_91+c(10)*IBES_91+c(11)*payout_91+c(12)*ROE_91
PB_92 = c(13)+c(14)*netdebtequity_92+c(15)*beta_92+c(16)*IBES_92+c(17)*payout_92+c(18)*ROE_92
PB_93 = c(19)+c(20)*netdebtequity_93+c(21)*beta_93+c(22)*IBES_93+c(23)*payout_93+c(24)*ROE_93
PB_94 = c(25)+c(26)*netdebtequity_94+c(27)*beta_94+c(28)*IBES_94+c(29)*payout_94+c(30)*ROE_94
PB_95 = c(31)+c(32)*netdebtequity_95+c(33)*beta_95+c(34)*IBES_95+c(35)*payout_95+c(36)*ROE_95
PB_96 = c(37)+c(38)*netdebtequity_96+c(39)*beta_96+c(40)*IBES_96+c(41)*payout_96+c(42)*ROE_96
PB_97 = c(43)+c(44)*netdebtequity_97+c(45)*beta_97+c(46)*IBES_97+c(47)*payout_97+c(48)*ROE_97
PB_98 = c(49)+c(50)*netdebtequity_98+c(51)*beta_98+c(52)*IBES_98+c(53)*payout_98+c(54)*ROE_98
PB_99 = c(55)+c(56)*netdebtequity_99+c(57)*beta_99+c(58)*IBES_99+c(59)*payout_99+c(60)*ROE_99
PB_00 = c(61)+c(62)*netdebtequity_00+c(63)*beta_00+c(64)*IBES_00+c(65)*payout_00+c(66)*ROE_00
PB_01 = c(67)+c(68)*netdebtequity_01+c(69)*beta_01+c(70)*IBES_01+c(71)*payout_01+c(72)*ROE_01
```

Restricted Option = 5 regressors

```
PB_90 = c(1)+c(2)*netdebtequity_90+c(3)*beta_90+c(4)*IBES_90+c(5)*payout_90+c(6)*ROE_90
PB_91 = c(1)+c(2)*netdebtequity_91+c(3)*beta_91+c(4)*IBES_91+c(5)*payout_91+c(6)*ROE_91
PB_92 = c(1)+c(2)*netdebtequity_92+c(3)*beta_92+c(4)*IBES_92+c(5)*payout_92+c(6)*ROE_92
PB_93 = c(1)+c(2)*netdebtequity_93+c(3)*beta_93+c(4)*IBES_93+c(5)*payout_93+c(6)*ROE_93
PB_94 = c(1)+c(2)*netdebtequity_94+c(3)*beta_94+c(4)*IBES_94+c(5)*payout_94+c(6)*ROE_94
PB_95 = c(1)+c(2)*netdebtequity_95+c(3)*beta_95+c(4)*IBES_95+c(5)*payout_95+c(6)*ROE_95
PB_96 = c(1)+c(2)*netdebtequity_96+c(3)*beta_96+c(4)*IBES_96+c(5)*payout_96+c(6)*ROE_96
PB_97 = c(1)+c(2)*netdebtequity_97+c(3)*beta_97+c(4)*IBES_97+c(5)*payout_97+c(6)*ROE_97
PB_98 = c(1)+c(2)*netdebtequity_98+c(3)*beta_98+c(4)*IBES_98+c(5)*payout_98+c(6)*ROE_98
PB_99 = c(1)+c(2)*netdebtequity_99+c(3)*beta_99+c(4)*IBES_99+c(5)*payout_99+c(6)*ROE_99
PB_00 = c(1)+c(2)*netdebtequity_00+c(3)*beta_00+c(4)*IBES_00+c(5)*payout_00+c(6)*ROE_00
PB_01 = c(1)+c(2)*netdebtequity_01+c(3)*beta_01+c(4)*IBES_01+c(5)*payout_01+c(6)*ROE_01
```

We employ Likelihood Ratio Tests (LR Test) to determine the preferred option: restricted versus unrestricted option. The LR Test enables one to choose from two different systems of equations:

- unrestricted option which is an existing set of parameters (60 regressors) or
- restricted option which involves putting restrictions on an existing set of parameters which effectively reduces the total number of regressors (5 regressors)

Table 5.2 below shows a summary of the results of LR Tests comparing the restricted versus unrestricted options for Models A, B and C.

The LR Tests compares the likelihood scores of the two systems of equations:

$LR = 2 \times (\ln L_1 - \ln L_2)$

where L1, L2 are likelihood scores of the systems of equations. The LR statistic approximately follows a chi-square distribution. To determine if the difference in the likelihood scores among the two systems of equations is statistically significant, degrees of freedom is considered. The degrees of freedom is equal to the number of additional regressors required, in this case the unrestricted system of equations compared to the restricted system of equations. Using this information, we can then determine the critical value of the test statistic from the standard statistical table and hence determine which system of equations is significant.

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Table 5.2 – Summary of results of LR Tests on Various Models

Model	P/B	P/E	P/Sales	P/D
Hong Kong				
A	Unrestricted sig	Unrestricted sig	Unrestricted sig	Unrestricted sig
B	Unrestricted sig	Unrestricted sig	Unrestricted sig	Unrestricted sig
C	Unrestricted sig	Unrestricted sig	Unrestricted sig	Unrestricted sig
Indonesia				
A	Restricted sig	Unrestricted sig	Restricted sig	Unrestricted sig
B	Unrestricted sig	Unrestricted sig	Unrestricted sig	Restricted sig
C	Restricted sig	Restricted sig	Unrestricted sig	Restricted sig
Japan				
A	Unrestricted sig	Unrestricted sig	Unrestricted sig	Unrestricted sig
B	Unrestricted sig	Unrestricted sig	Unrestricted sig	Unrestricted sig
C	Unrestricted sig	Unrestricted sig	Unrestricted sig	Unrestricted sig
Korea				
A	Unrestricted sig	Unrestricted sig	Unrestricted sig	Unrestricted sig
B	Unrestricted sig	Unrestricted sig	Unrestricted sig	Restricted sig
C	Unrestricted sig	Unrestricted sig	Unrestricted sig	Restricted sig
Malaysia				
A	Unrestricted sig	Unrestricted sig	Unrestricted sig	Unrestricted sig
B	Unrestricted sig	Unrestricted sig	Unrestricted sig	Unrestricted sig
C	Unrestricted sig	Unrestricted sig	Unrestricted sig	Unrestricted sig
Philippines				
A	Restricted sig	Restricted sig	Restricted sig	Restricted sig
B	Restricted sig	Restricted sig	Restricted sig	Unrestricted sig
C	Restricted sig	Restricted sig	Restricted sig	Restricted sig
Singapore				
A	Unrestricted sig	Unrestricted sig	Unrestricted sig	Unrestricted sig
B	Unrestricted sig	Unrestricted sig	Unrestricted sig	Unrestricted sig
C	Unrestricted sig	Unrestricted sig	Unrestricted sig	Unrestricted sig
Taiwan				
A	Unrestricted sig	Unrestricted sig	Unrestricted sig	Unrestricted sig
B	Unrestricted sig	Unrestricted sig	Unrestricted sig	Restricted sig
C	Restricted sig	Unrestricted sig	Unrestricted sig	Unrestricted sig
Thailand				
A	Unrestricted sig	Unrestricted sig	Unrestricted sig	Unrestricted sig
B	Unrestricted sig	Unrestricted sig	Unrestricted sig	Unrestricted sig
C	Unrestricted sig	Unrestricted sig	Unrestricted sig	Unrestricted sig

Notes for Table 5.2

i) Model C based on P/B in Taiwan uses data period from 6/1995-6/2001. There was inadequate observation in Year 1994 to run SUR regression using the unrestricted option.

ii) 'Sig' represents Significant.

Preferred Option - Restricted vs Unrestricted

The results show that the unrestricted option is statistically more significant than the restricted option.

Twenty-one out of twenty-seven models with P/B as the dependent variable show the unrestricted options as more significant based on the results of the LR tests. All models in Philippines, 2 models in Indonesia and one model in Taiwan show the restricted option being more significant.

The unrestricted option is appropriate in practical applications as the coefficients of underlying independent variables are permitted to vary across time.

Underlying economic conditions and investor sentiment in particular markets and sectors which vary with time may alter the significance of the underlying independent variables across different time periods. For example, in an uncertain environment driven by a combination of changing forces in politics and economic conditions, investors may focus on certainty in earnings, strength in balance sheets and sustainable dividend payout ratios. However, when markets switch to a more bullish phase, investors focus less on certainty in favour of upside potential making variables such as growth forecasts, ROEs, net profit margins become more important.

Moreover, the investment framework in a country may differ with the composition of retail/institutional investors. The behavioural characteristics of retail and institutional investors differ to the extent of investment horizon and availability of research information. Traditionally, retail investors have a short term investment horizon with a view to making money through speculation using common sources of information such as gossips, leaks and tips and not on solid fundamental reasons. This may cause a breakdown in the relationship between the underlying independent variables and the dependent variables which are the fundamental ratios (P/B, P/E, P/Sales, P/D). Hence, it is imperative to make use of unrestricted options in order to overcome such distortions across different time periods.

Also, different countries are dominated by different sectors. For example, the Indonesian market is dominated by resources/industrial materials mainly timber, palm oil, crude oil/gas, minerals and pulp/paper which are correlated to their respective global sectors rather than their respective domestic markets. Hence, they tend to be driven by the same fundamental drivers that drive these sectors in the global markets across different time periods. These global sectors have their own economic cycles which vary with time; hence these may cause alterations in the significance of the underlying independent variables across different time periods.

We also find that some markets tend to work better with restricted options.
The results in Table 5.2 show that Philippines is the only market with the restricted options being more significant compared to the unrestricted options across all models (P/B, P/E, P/Sales, P/D). This could be due to the fact that the time period used in our analysis for Philippines comprises 1994-2003. During this period, the Philippines had been plagued by a series of political problems following the ouster of President Marcos and further weakened by the Asian crisis. In short, the Philippines market had not seen any cyclical changes in its economy to warrant the significance of any underlying variable. Philippines market mainly captures the interest of investors when it is perceived to be 'cheap' using widely available indicators such as P/B, P/E etc.

Hence based on the above reasons and results in Table 5.2, we refer to the unrestricted models as our preferred option for the basis of our study.

Formation of Portfolios Based on 'Multi-factor' Composite Criteria
At the end of June each year, over the sample period, we generate 'multi-factor composite value' for each firm to estimate the respective valuation ratios for the firms. The estimates of coefficients obtained from the regressions above using dependent variables such as P/B, P/E, P/Sales and P/D (inverse of dividend yield) are used as weights and are then multiplied to the variables identified in Models A, B and C to produce the multi-factor composite value for each company.

Example II (i) below shows SUR regressions conducted on P/B as a dependent variable that determines estimates of the coefficients of the independent variables used in Model A. Example II (ii) below shows the computations for the 'multi-factor composite value' for each company to estimate its P/B ratio annually. The composite value for each company (in this case "P/B" composite value) is obtained by multiplying the estimated coefficients from the SUR regressions using P/B as a dependent variable, to the respective variables for each company identified in Model A.

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Example II

i) SUR Regression on P/B as dependent variable against independent variables of Model A

```
PB_90 = c(1)+c(2)*netdebtequity_90+c(3)*beta_90+c(4)*IBES_90+c(5)*payout_90+c(6)*ROE_90
PB_91 = c(7)+c(8)*netdebtequity_91+c(9)*beta_91+c(10)*IBES_91+c(11)*payout_91+c(12)*ROE_91
PB_92 = c(13)+c(14)*netdebtequity_92+c(15)*beta_92+c(16)*IBES_92+c(17)*payout_92+c(18)*ROE_92
PB_93 = c(19)+c(20)*netdebtequity_93+c(21)*beta_93+c(22)*IBES_93+c(23)*payout_93+c(24)*ROE_93
PB_94 = c(25)+c(26)*netdebtequity_94+c(27)*beta_94+c(28)*IBES_94+c(29)*payout_94+c(30)*ROE_94
PB_95 = c(31)+c(32)*netdebtequity_95+c(33)*beta_95+c(34)*IBES_95+c(35)*payout_95+c(36)*ROE_95
PB_96 = c(37)+c(38)*netdebtequity_96+c(39)*beta_96+c(40)*IBES_96+c(41)*payout_96+c(42)*ROE_96
PB_97 = c(43)+c(44)*netdebtequity_97+c(45)*beta_97+c(46)*IBES_97+c(47)*payout_97+c(48)*ROE_97
PB_98 = c(49)+c(50)*netdebtequity_98+c(51)*beta_98+c(52)*IBES_98+c(53)*payout_98+c(54)*ROE_98
PB_99 = c(55)+c(56)*netdebtequity_99+c(57)*beta_99+c(58)*IBES_99+c(59)*payout_99+c(60)*ROE_99
PB_00 = c(61)+c(62)*netdebtequity_00+c(63)*beta_00+c(64)*IBES_00+c(65)*payout_00+c(66)*ROE_00
PB_01 = c(67)+c(68)*netdebtequity_01+c(69)*beta_01+c(70)*IBES_01+c(71)*payout_01+c(72)*ROE_01
```

ii) Multi-factor Composite Value ("P/B" composite) for each company using Model A (based on coefficient estimates derived from regressions using P/B as dependent variable)

```
Coi _90 = c (1)+c(2)*netdebtequity i _90+c(3)*beta i _90+c(4)*IBES i _90+c(5)*payout i _90+c(6)*ROE i _90
Coi _91 = c (7)+c(8)*netdebtequity i _91+c(9)*beta i _91+c(10)*IBES i _91+c(11)*payout i _91+c(12)*ROE i _91
Coi _92 = c (13)+c(14)*netdebtequity i _92+c(15)*beta i _92+c(16)*IBES i _92+c(17)*payout i _92+c(18)*ROE i _92
Coi _93 = c (19)+c(20)*netdebtequity i _93+c(21)*beta i _93+c(22)*IBES i _93+c(23)*payout i _93+c(24)*ROE i _93
Coi _94 = c (25)+c(26)*netdebtequity i _94+c(27)*beta i _94+c(28)*IBES i _94+c(29)*payout i _94+c(30)*ROE i _94
Coi _95 = c (31)+c(32)*netdebtequity i _95+c(33)*beta i _95+c(34)*IBES i _95+c(35)*payout i _95+c(36)*ROE i _95
Coi _96 = c (37)+c(38)*netdebtequity i _96+c(39)*beta i _96+c(40)*IBES i _96+c(41)*payout i _96+c(42)*ROE i _96
Coi _97 = c (43)+c(44)*netdebtequity i _97+c(45)*beta i _97+c(46)*IBES i _97+c(47)*payout i _97+c(48)*ROE i _97
Coi _98 = c (49)+c(50)*netdebtequity i _98+c(51)*beta i _98+c(52)*IBES i _98+c(53)*payout i _98+c(54)*ROE i _98
Coi _99 = c (55)+c(56)*netdebtequity i _99+c(57)*beta i _99+c(58)*IBES i _99+c(59)*payout i _99+c(60)*ROE i _99
Coi _00 = c (61)+c(62)*netdebtequity i _00+c(63)*beta i _00+c(64)*IBES i _00+c(65)*payout i _00+c(66)*ROE i _00
Coi _01 = c (67)+c(68)*netdebtequity i _01+c(69)*beta i _01+c(70)*IBES i _01+c(71)*payout i _01+c(72)*ROE i _01
```

where,

Co_i represents the 'multi-factor composite value' for company i which is the estimated value of P/B ratio for company i

In conducting the SUR regressions, we make sure that only companies with available data for each dependent variable as well as all independent variables tested based on Models A, B and C are used in the data set.

For example, cross-sectional regression on P/Sales implies that our data set will only contain companies with available P/Sales ratios, positive net profit margins, available net debt equity, beta, past 1 year earnings growth rate, past 1 year sales growth rate, IBES Consensus Mean FY1 earnings growth rate, payout ratio and historical price performance figures. This ensures that the same set of companies will be used for regressions on P/Sales for Models A, B and C.

Similarly, cross-sectional regression on P/B implies that our data set will only contain companies with positive P/B ratios, positive ROEs, available net debt equity, beta, past 1 year earnings growth rate, past 1 year sales growth rate, IBES Consensus Mean FY1 earnings growth rate, payout ratio and historical price performance figures. This ensures that the same set of companies will be used for regressions on P/B for Models A, B and C.

We then rank firms based on the percentile rank of their multi-factor composite value. Three fractile portfolios are formed in ascending order based on the percentile rank. Portfolios are formed both on an equal weighted basis as well as market capitalisation weighted basis. Value portfolio refers to group of stocks in the lowest fractile while growth portfolio refers to stocks in the highest fractile. We make use of an annual buy and hold strategy. Portfolios are rebalanced at the end of each June and returns are computed for each month beginning from July of each year until end of June the following year. The returns are computed both on an absolute and risk adjusted basis which is the ratio of average monthly returns to standard deviation of monthly returns. The T-statistic of the value-growth spread is also observed across the sample period. The above process is replicated across each country in this study.

5.5 Description of Company Specific Variables

Historical 1 Year Price Performance

Historical 1 year price performance is computed for use as one of the company specific fundamentals. Discrete price data for companies in emerging market is extremely volatile and randomly available as some companies may not observe trading activity for long periods of time.

For example, difficulties were encountered in computing historical 1 year past price performance based on just 2 points in time e.g. June of Year t and June of Year t-1. This is because the smaller stocks may not even have traded in say June Year t-1 and therefore no price data may be available for June Year t-1. Therefore, to reduce the influence of such factors on the regression result, we computed the historical 1 year price performance by measuring the slope of a least squares curve fit to the logarithms of the past 12 months of stock price data. The exponentiated slope was used to represent the past price performance growth. If price data is missing for either months t-12 or t, then we do not calculate price performance for that observation.

Dechow and Sloan (1997) had also applied this methodology in computing earnings/sales growth rates for their analysis.

This approach helped us to reduce the influence of timing and event related issue (which arises from use of data based on just 2 specific points in time) on the regression results.

Beta

We also computed the beta of each stock relative to its broad market index. The beta of each stock is computed as the slope of the monthly returns for each company relative to its broad market index over the past 36 months. The following broad market indices are used for each market when computing the beta (slope of monthly returns) for each company:

Hong Kong -	Hang Seng Index
Indonesia -	Indonesia Jakarta Stock Exchange (JSE) Composite
Japan -	Topix Index
Korea -	Korea KOPSI Composite
Malaysia -	Malaysia Kuala Lumpur Stock Exchange
Philippines -	Philippines Stock Exchange (PSE) Composite
Singapore -	Singapore Straits Times Index
Taiwan -	Taiwan TSEC Weighted Average Index
Thailand -	Stock Exchange of Thailand Index (SET)

We are not able to use the MSCI indices to represent the broad market as this would restrict us to only 4 to 8 years of data. To conduct the regression, we need to compute the beta of companies using data over several 36 month intervals.

E.g. MSCI Indonesia has its sample coverage starting in 1993. The use of 36 month intervals of data to conduct the regression for the computation of betas imply that we are restricted to the use of data starting from 1996 onwards to conduct our research analysis involving cross-sectional regressions and building portfolios based on composites.

Measures of Growth Rates

Hypotheses I is tested using two forms of expectations of growth.

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We test Hypothesis I using two forms of expectations of growth as follows:
Model A uses *forecast* growth rate based on IBES Consensus Mean FY1 earnings growth rate
Model B uses *past* growth rate based on past 1 year actual earnings growth rate and past 1 year actual sales growth rate

Model C includes an additional variable to Model B. This additional variable is historical price performance of stocks.

Model A – Mix of Historical and Forecast Data

Model A makes use of expectations of growth based on analysts forecasts of 1 year earnings growth rate. Forecast earnings growth rates are used in Gordon's Growth Models.

Analysts forecasts of 1 year earnings growth rate is obtained using the IBES Consensus Mean FY1 earnings growth forecast. IBES Consensus Mean FY1 earnings growth rate is used because long term consensus IBES earnings growth figures are not available for most companies in our universe.

Consensus IBES earnings growth rate is the industry proxy for expectation of future growth opportunities a company. The IBES estimates provide a direct measure of expectations and are available on a timely basis. For the purpose of this research, we collected the earnings growth forecasts that are made available only as of June of each year. This is to ensure that all forecasts used are made 1 to12 months prior to the release of their actual results.

Model B – Historical Data

Model B makes use of expectations of growth based on extrapolation of past earnings and sales performance. Both 1 year past earnings growth and 1 year past sales growth are used.

Preliminary evidence shows the existence of collinearity between future growth rate (IBES Consensus Mean FY1 earnings growth) and past growth rate (1 year past earnings / sales growth). The preliminary evidence shows that investors and analysts form expectations about future growth opportunities by extrapolating past earnings growth although growth may be mean reverting. Thus, it is not feasible to compute the regression estimates when the valuation ratios are regressed on all three different past and future growth rates simultaneously.

Table 5.3 below shows the correlation coefficient between 1 year past earnings growth and IBES Mean FY1 earnings growth for a sample of markets at two different time periods. We appreciate that the extent of collinearity do vary across markets and time.

Table 5.3 – Correlation Coefficients between Historical and Forecast Earnings Growth

Correlation Coefficient	Japan	Malaysia	Singapore	Taiwan
1990	0.45	N/A	0.43	N/A
1994	0.30	0.32	0.57	0.30

Notes for Table 5.3

Both Malaysia and Taiwan in our studies are covered from 1993 onwards.

The evidence that investors and analysts form expectations of the future by extrapolating the past is supported in a number of papers such as Lakonishok et al (1994), De Bondt et al (1985,1987), Dechow et al (1997) and La Porta (1996). The analyses support the theory of superior performance of value stocks over growth stocks using valuation ratios such as P/B.

These ratios have predictive power because they capture systematic errors in the way that both investors and analysts form expectations about future growth opportunities. Investors naively extrapolate past earnings even though growth is mean reverting or naively rely on analysts' forecasts of long term growth; even though forecasts are systematically proven to be over-optimistic or over-pessimistic influenced by past events. Therefore, a low P/B stock with low past earnings growth is naively accepted as a value stock with no future growth opportunities or price upside. Sophisticated investors can therefore exploit naïve investor assumptions by identifying value stocks which do have future growth opportunities and price upside.

Model C – Historical Data

Model C makes use of expectations of growth based on past performance of earnings and sales (represented by 1 year past earnings growth and 1 year past sales growth), as in Model B, with the addition of historical price performance.

As discussed, there is reason to believe that for a value investor to capture the maximum potential upside of the price performance for value stocks, the issue of entry point of the holding period is important. Thus the 'Price' element used in Model C should not be ignored as one of the drivers.

Studies by De Bondt and Thaler (1985, 1987) explained that expectational error caused by extrapolating past growth based solely on past price performance explained the superior performance of value stocks over growth stocks. This supports the inclusion of price as a variable in Model C.

Forecast earnings growth rate
IBES Consensus Mean fiscal year 1 (FY1) earnings growth rate. Stock analysts contribute their earnings forecasts for the next fiscal year (FY1) which are compiled by service provider IBES to determine the IBES Consensus Mean FY1 earnings growth rate.
The forecasts refer to earnings per share before extraordinary items

Net debt equity ratio
Total long term debt minus cash and equivalents as a ratio of common equity for the fiscal year ending t-1

Net profit margin
Net income as a ratio of net sales for the fiscal year ending t-1

Past 1 year actual earnings growth rate
Growth in net income between the fiscal years ending t-2 and t-1

Past 1 year actual sales growth rate
Growth in sales between the fiscal years ending t-2 and t-1

Payout ratio
Total annual common dividends as a ratio of net income for the fiscal year ending t-1

Return on equity (ROE)
Net income as a ratio of common equity for the fiscal year ending t-1

The above valuation ratios are calculated using closing market price as at end June of fiscal year t divided by the accounting values based on fiscal year ending t-1.

5.6 Data Treatment

Regressions are carried out on the valuation ratios which are proxies for value and growth stocks and company specific variables. Company specific variables are prone to suffer from extreme volatility depending on both financial performance of the company and stock market conditions.

Distortions in the data may cause the standard errors of the coefficient estimates to be large. The high statistical noise in errors reduces the statistical reliability of the coefficient estimates.

In order to reduce the influence of distortions in the data on the results of the above regressions; all data used in this study has been 'winsorized'. The bottom 5% of the values are set equal to the value corresponding to the 5th percentile while the upper 5% of the values are set equal to the value corresponding to the 95th percentile.

Having all data 'winsorized' helps ensure that the standard errors of the coefficient estimates are normally distributed. This implies that there are 2 chances in 3 that the "true" regression coefficient lies within one standard error of the reported coefficient and 95 chances out of 100 that it lies within two standard errors.

5.7 Theoretical Drivers behind Proxies for Value and Growth Stocks

This section tests Hypothesis I and II. We investigate the significance of the theoretical drivers which explain the variability of valuation ratios using multivariate cross-sectional regressions in each country across its sample periods. We also determine whether the cross-sectional explanatory power of the theoretical drivers vary across countries and time periods.

Section 5.7.1 describes the multivariate cross-sectional regressions carried out on each dependent variable – P/B, P/E, P/Sales and P/D. Section 5.7.2 describes the various diagnostic tests employed to determine the statistical significance of the power of the 'drivers' or independent variables in explaining the variability of the valuation ratios. Section 5.7.3 provides an analysis of the results of the diagnostic tests and establishes the drivers behind the variability of valuation ratios.

5.7.1 Multivariate Cross-sectional Regressions

Multivariate cross-sectional regressions are carried out each year on each dependent variable - P/B, P/E, P/Sales and P/D against each of the company specific independent variables defined in Models A, B and C are as follows:

Equation 5.1: $P/B = \alpha + \beta_1 \text{Risk} + \beta_2 \text{Growth Rate} + \beta_3 \text{Payout Ratio} + \beta_4 \text{ROE}$

Equation 5.2: $P/E = \alpha + \beta_1 \text{Risk} + \beta_2 \text{Growth Rate} + \beta_3 \text{Payout Ratio}$

Equation 5.3: $P/Sales = \alpha + \beta_1 \text{Risk} + \beta_2 \text{Growth Rate} + \beta_3 \text{Payout Ratio} + \beta_4 \text{Net Profit Margin}$

Equation 5.4: $P/D = \alpha + \beta_1 \text{Risk} + \beta_2 \text{Growth Rate}$

where;

risk = beta, Net Debt/Equity;

growth rate = investors' expectations of future growth as defined in Models A, B and C

The variables defined in Models A, B and C are as follows:

Model A-	growth rate that uses IBES Consensus Mean FYI earnings growth forecasts
Model B-	growth rates that uses 1 year past earnings growth and 1 year past sales growth
Model C-	growth rates that uses 1 year past earnings growth and 1 year past sales growth as in Model B plus 1 year historical price performance

As discussed in the previous section, Seemingly Unrelated Regression (SUR) method using the Unrestricted Option (coefficients vary across time) is employed to capture the drivers behind the variability of P/B, P/E, P/Sales and P/D.

5.7.2 Diagnostic Tests

Various diagnostic tests are employed to determine the significance of the power of the independent variables in explaining the variability of P/B, P/E, P/Sales and P/D. Tests are also conducted to determine the measure of good fit and appropriateness of the specification of the relationships between P/B, P/E, P/Sales and P/D and the independent variables defined in Models A, B and C.

5.7.2.1 Tests to Determine Significance of Independent Variables

Wald Test is conducted on coefficients to determine whether the variables are significant across time. It makes use of a Chi-square distribution with n-degrees of freedom.
The specification of the two-tailed hypothesis at the 5% level is as follows:

$H_0 : c(i_i)=c(i_n)=0$
H_1 : at least 1 c(i) is not equal zero

T-statistic is also computed at each time period to determine the significance of the variables at the 5% level at each time period, in this case annually. The specification of the two-tailed hypothesis at the 5% level is as follows:

$H_0 : c(i_i)=0$
$H_1 : c(i_i)\neq 0$

5.7.2.2 Tests to Determine Measure of Good Fit

We make use of Schwarz Criterion (SC) as a guide to selecting the model of independent variables (Model A, B or C). The Schwarz Criterion provides a measure of information that strikes balance between the 'goodness of fit' on the dependent variable and parsimonious specification of the model. Schwarz Criterion is adjusted by a penalty for additional coefficients and the smaller values of Schwarz Criterion is preferred.

Schwarz Criterion is computed as follows:

$$SC = -2 \times \frac{l}{n} + k \times \frac{\log n}{n}$$

where;

$$l = -\frac{n \times m}{2} \times (1 + \log 2\pi) - \frac{n}{2} \times \log |\partial|$$

l = log of the likelihood function

n = no of observations

m = number of equations

k = number of parameters

∂ = Determinant Residual Covariance as reported in the SUR Regression output

5.7.3 Analysis of Results

Tables 5.4 – 5.7 summarise the results of the Wald Tests (p-values) & frequency of the independent variables recorded as being significant based on their T-statistics at each time period. Table 5.10 reports the computations of the Schwarz Criterion for P/B, P/E, P/Sales and P/D using a set of independent variables identified by Models A, B and C.

The multivariate cross-sectional regressions in Tables 5.4 – 5.7 show that the theoretical drivers of the proxies for value and growth stocks based on a combination of variables – company fundamentals, growth prospects and stock specific risks; all have joint roles in explaining the variability of P/B, P/E, P/Sales and P/D. However, some variables have more prominent roles than others in explaining the variability of P/B, P/E, P/Sales and P/D.

We observe prominent roles for some variables based on the results of the regressions performed: We also provide some plausible explanations behind the use of valuation ratios based on single factor variables such as P/B, P/E, P/Sales and P/D in classifying value and growth stocks based on the prominent roles of the underlying drivers.

In each country, the coefficients of ROE and net profit margin derived from the regressions conducted annually have positive values as one would expect. In an efficient market, it would not be surprising to find stocks with high ROEs and net profit margins to trade at high P/B and P/Sales multiples as corporate fundamentals and corporate growth prospects drive stock prices. ROE and net profit margin as the most important determinant of P/B and P/Sales respectively provides reasoning behind the use of high P/B and P/Sales multiples for classifying growth stocks.

In each country, the coefficients of payout ratio derived from the regressions conducted annually against P/E as dependent variable have positive values. This implies that P/E of a firm is an increasing function of payout ratio of a firm. One can understand the logic used by academics and practitioners in classifying low P/E stocks as value stocks – by definition low P/E multiple of a firm has low payout ratio but has the capacity of providing further growth in dividend payments as the company grows in the foreseeable future. Corporate fundamentals are reflected in a firm's payout ratio and hence its dividend growth. Moreover, dividends represent the most direct measure of cashflow to a shareholder.

5.7.3.1 P/B as Dependent Variable

The regressions conducted using P/B as a dependent variable in Tables 5.4 (a), (b) and (c) confirm the prominent role of return on equity (ROE) in explaining the variability of P/B. The coefficients of ROE for each country are statistically significant across the sample time period using Wald Test at the 5% level.

P/B

Table 5.4(a) – Regressions based on Dependent Variable P/B against Independent Variables in Model A: Forecasts Earnings Growth Rate

Country	Net Debt equity Ratio	Beta	IBES growth	Payout Ratio	ROE
Hong Kong					
Wald Test	0.31	0.00*	0.06	0.00*	0.00*
No of T-stat sig	2/12 sig	3/12 sig	1/12 sig	8/12 sig	12/12 sig
Indonesia					
Wald Test	0.35	0.04*	0.47	0.02*	0.00*
No of T-stat sig	0/9 sig	2/9 sig	1/9 sig	2/9 sig	7/9 sig
Japan					
Wald Test	0.00*	0.00*	0.00*	0.00*	0.00*
No of T-stat sig	12/12 sig	9/12 sig	10/12 sig	11/12 sig	12/12 sig
Korea					
Wald Test	0.33	0.24	0.00*	0.24	0.00*
No of T-stat sig	0/9 sig	0/9 sig	3/9 sig	0/9 sig	8/9 sig
Malaysia					
Wald Test	0.02*	0.00*	0.00*	0.00*	0.00*
No of T-stat sig	2/9 sig	3/9 sig	4/9 sig	5/9 sig	9/9 sig
Philippines					
Wald Test	0.86	0.45	0.22	0.87	0.00*
No of T-stat sig	0/8 sig	0/8 sig	0/8 sig	0/8 sig	7/8 sig
Singapore					
Wald Test	0.59	0.00*	0.04*	0.00*	0.00*
No of T-stat sig	1/12 sig	2/12 sig	1/12 sig	3/12 sig	12/12 sig
Taiwan					
Wald Test	0.71	0.01*	0.01*	0.76	0.00*
No of T-stat sig	1/8 sig	2/8 sig	2/8 sig	0/8 sig	5/8 sig
Thailand					
Wald Test	0.74	0.01*	0.23	0.03*	0.00*
No of T-stat sig	0/9 sig	3/9 sig	0/9 sig	2/9 sig	8/9 sig

Notes for Table 5.4(a)

i) 'Sig' represents Significant and '*' represents Significant at 5%..

ii) The number of companies used in the regressions across each time period is reported in Appendix 2 of Chapter 3.

P/B

Table 5.4(b) – Regressions based on Dependent Variable P/B against Independent Variables in Model B: Past Earnings & Past Sales Growth Rates

Country	Net Debt equity Ratio	Beta	Past eps growth	Payout Ratio	ROE	Past sales growth
Hong Kong						
Wald Test	0.06	0.00*	0.00*	0.00*	0.00*	0.00*
No of T-stat sig	2/12 sig	6/12 sig	5/12 sig	4/12 sig	12/12 sig	3/12 sig
Indonesia						
Wald Test	0.55	0.00*	0.02*	0.70	0.00*	0.18
No of T-stat sig	0/9 sig	2/9 sig	2/9 sig	0/9 sig	7/9 sig	1/9 sig
Japan						
Wald Test	0.00*	0.00*	0.00*	0.00*	0.00*	0.00*
No of T-stat sig	10/12 sig	11/12 sig	5/12 sig	12/12 sig	12/12 sig	10/12 sig
Korea						
Wald Test	0.04*	0.65	0.38	0.02*	0.00*	0.00*
No of T-stat sig	2/9 sig	0/9 sig	0/9 sig	3/9 sig	7/9 sig	3/9 sig
Malaysia						
Wald Test	0.07	0.00*	0.00*	0.00*	0.00*	0.00*
No of T-stat sig	1/9 sig	3/9 sig	3/9 sig	4/9 sig	9/9 sig	2/9 sig
Philippines						
Wald Test	0.41	0.07	0.01*	0.8	0.00*	0.12
No of T-stat sig	0/8 sig	2/8 sig	3/8 sig	0/8 sig	8/8 sig	1/8 sig
Singapore						
Wald Test	0.10	0.00*	0.08	0.00*	0.00*	0.22
No of T-stat sig	1/12 sig	4/12 sig	2/12 sig	7/12 sig	12/12 sig	1/12 sig
Taiwan						
Wald Test	0.00*	0.00*	0.00*	0.00*	0.00*	0.00*
No of T-stat sig	1/8 sig	2/8 sig	1/8 sig	1/8 sig	2/8 sig	2/8 sig
Thailand						
Wald Test	0.01*	0.00*	0.53	0.08	0.00*	0.00*
No of T-stat sig	2/9 sig	2/9 sig	1/9 sig	1/9 sig	7/9 sig	3/9 sig

Notes for Table 5.4(b)

i) 'Sig' represents Significant and '*' represents Significant at 5%..

ii) The number of companies used in the regressions across each time period is reported in Appendix 2 of Chapter 3.

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P/B

Table 5.4(c) – Regressions based on Dependent Variable P/B against Independent Variables in Model C: Past Earnings & Past Sales Growth Rates + Historical Price Performance

Country	Netdebtequity Ratio	Beta	Past eps growth	Payout Ratio	ROE	Past sales growth	Past Price Performance
Hong Kong							
Wald Test	0.16	0.00*	0.00*	0.00*	0.00*	0.00*	0.00*
No of T-stat sig	2/12 sig	5/12 sig	8/12 sig	5/12 sig	12/12 sig	2/12 sig	10/12 sig
Indonesia							
Wald Test	0.43	0.01*	0.00*	0.26	0.00*	0.23	0.00*
No of T-stat sig	0/9 sig	2/9 sig	3/9 sig	1/9 sig	5/9 sig	1/9 sig	5/9 sig
Japan							
Wald Test	0.00*	0.00*	0.00*	0.00*	0.00*	0.00*	0.00*
No of T-stat sig	11/12 sig	9/12 sig	9/12 sig	12/12 sig	12/12 sig	10/12 sig	12/12 sig
Korea							
Wald Test	0.00*	0.24	0.25	0.02*	0.00*	0.00*	0.00*
No of T-stat sig	3/9 sig	0/9 sig	0/9 sig	1/9 sig	6/9 sig	3/9 sig	6/9 sig
Malaysia							
Wald Test	0.06	0.00*	0.00*	0.00*	0.00*	0.17	0.00*
No of T-stat sig	2/9 sig	4/9 sig	5/9 sig	4/9 sig	9/9 sig	1/9 sig	9/9 sig
Philippines							
Wald Test	0.21	0.09	0.00*	0.54	0.00*	0.12	0.00*
No of T-stat sig	1/8 sig	1/8 sig	4/8 sig	0/8 sig	5/8 sig	1/8 sig	3/8 sig
Singapore							
Wald Test	0.06	0.02*	0.00*	0.00*	0.00*	0.40	0.00*
No of T-stat sig	2/12 sig	4/12 sig	2/12 sig	6/12 sig	12/12 sig	0/12 sig	9/12 sig
Taiwan							
Wald Test	0.46	0.35	0.46	0.97	0.02*	0.62	0.00*
No of T-stat sig	0/7	0/7	0/7	0/7	1/7	0/7	1/7
Thailand							
Wald Test	0.00*	0.00*	0.06	0.02*	0.00*	0.00*	0.00*
No of T-stat sig	2/9 sig	3/9 sig	1/9 sig	2/9 sig	7/9 sig	3/9 sig	8/9 sig

Notes for Table 5.4(c)

i) 'Sig' represents Significant and '*' represents Significant at 5%..

ii) Model C based on P/B in Taiwan uses data period from 6/1995-6/2001.

There was inadequate observation in Year 1994 to run SUR regression using the unrestricted option.

iii) The number of companies used in the regressions across each time period is reported in Appendix 2 of Chapter 3.

5.7.3.2 P/E as Dependent Variable

Similarly, the regressions conducted on P/E as dependent variable in Tables 5.5(a), (b) and (c) confirm the prominent role of payout ratio in explaining the variability of P/E as determined by results of the Wald Tests at the 5% level.

P/E

Table 5.5(a) – Regressions based on Dependent Variable P/E against Independent Variables in Model A: Forecast Earnings Growth Rate

Country	Netdebtequity Ratio	Beta	IBES growth	Payout Ratio
Hong Kong				
Wald Test	0.22	0.00*	0.01*	0.00*
No of T-stat sig	3/12 sig	4/12 sig	4/12 sig	12/12 sig
Indonesia				
Wald Test	0.12	0.01*	0.00*	0.00*
No of T-stat sig	1/9 sig	2/9 sig	2/9 sig	5/9 sig
Japan				
Wald Test	0.00*	0.00*	0.00*	0.00*
No of T-stat sig	5/12 sig	8/12 sig	10/12 sig	12/12 sig
Korea				
Wald Test	0.24	0.02*	0.00*	0.00*
No of T-stat sig	0/9 sig	2/9 sig	4/9 sig	9/9 sig
Malaysia				
Wald Test	0.14	0.00*	0.00*	0.00*
No of T-stat sig	1/9 sig	3/9 sig	8/9 sig	9/9 sig
Philippines				
Wald Test	0.00*	0.92	0.00*	0.01*
No of T-stat sig	2/8 sig	0/8 sig	2/8 sig	3/8 sig
Singapore				
Wald Test	0.04*	0.04*	0.00*	0.00*
No of T-stat sig	4/12 sig	2/12 sig	7/12 sig	12/12 sig
Taiwan				
Wald Test	0.20	0.00*	0.00*	0.00*
No of T-stat sig	1/8 sig	5/8 sig	5/8 sig	8/8 sig
Thailand				
Wald Test	0.66	0.02*	0.01*	0.00*
No of T-stat sig	1/9 sig	3/9 sig	2/9 sig	5/9 sig

Notes for Table 5.5(a)

i) 'Sig' represents Significant and '*' represents Significant at 5%..

ii) The number of companies used in the regressions across each time period is reported in Appendix 2 of Chapter 3.

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P/E

Table 5.5(b) – Regressions based on Dependent Variable P/E against Independent Variables in Model B: Past Earnings & Past Sales Growth Rates

Country	Netdebtequity Ratio	Beta	Past eps growth	Payout Ratio	Past sales growth
Hong Kong					
Wald Test	0.00*	0.00*	0.00*	0.00*	0.00*
No of T-stat sig	5/12 sig	4/12 sig	6/12 sig	12/12 sig	2/12 sig
Indonesia					
Wald Test	0.14	0.01*	0.00*	0.00*	0.37
No of T-stat sig	1/9 sig	4/9 sig	2/9 sig	6/9 sig	1/9 sig
Japan					
Wald Test	0.00*	0.00*	0.00*	0.00*	0.00*
No of T-stat sig	8/12 sig	10/12 sig	8/12 sig	12/12 sig	12/12 sig
Korea					
Wald Test	0.07	0.01*	0.00*	0.00*	0.00*
No of T-stat sig	2/9 sig	2/9 sig	2/9 sig	9/9 sig	3/9 sig
Malaysia					
Wald Test	0.74	0.00*	0.00*	0.00*	0.00*
No of T-stat sig	0/9 sig	6/9 sig	3/9 sig	9/9 sig	4/9 sig
Philippines					
Wald Test	0.00*	0.35	0.00*	0.00*	0.00*
No of T-stat sig	2/8 sig	0/8 sig	4/8 sig	3/8 sig	2/8 sig
Singapore					
Wald Test	0.06	0.00*	0.00*	0.00*	0.00*
No of T-stat sig	2/12 sig	3/12 sig	6/12 sig	12/12 sig	1/12 sig
Taiwan					
Wald Test	0.98	0.00*	0.00*	0.00*	0.05
No of T-stat sig	0/8 sig	5/8 sig	2/8 sig	8/8 sig	2/8 sig
Thailand					
Wald Test	0.68	0.00*	0.01*	0.00*	0.00*
No of T-stat sig	0/9 sig	4/9 sig	1/9 sig	7/9 sig	5/9 sig

Notes for Table 5.5(b)

i) 'Sig' represents Significant and '*' represents Significant at 5%..

ii) The number of companies used in the regressions across each time period is reported in Appendix 2 of Chapter 3.

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P/E

Table 5.5(c) – Regressions based on Dependent Variable P/E against Independent Variables in Model C: Past Earnings & Past Sales Growth Rates + Historical Price Performance

Country	Net Debt equity Ratio	Beta	Past eps growth	Payout Ratio	Past sales growth	Past Price Performance
Hong Kong						
Wald Test	0.01*	0.04*	0.00*	0.00*	0.00*	0.00*
No of T-stat sig	4/12 sig	3/12 sig	7/12 sig	12/12 sig	1/12 sig	8/12 sig
Indonesia						
Wald Test	0.11	0.00*	0.00*	0.00*	0.30	0.00*
No of T-stat sig	2/9 sig	4/9 sig	3/9 sig	6/9 sig	1/9 sig	5/9 sig
Japan						
Wald Test	0.00*	0.00*	0.00*	0.00*	0.00*	0.00*
No of T-stat sig	7/12 sig	9/12 sig	9/12 sig	12/12 sig	11/12 sig	12/12 sig
Korea						
Wald Test	0.41	0.01*	0.00*	0.00*	0.12	0.00*
No of T-stat sig	1/9 sig	3/9 sig	3/9 sig	9/9 sig	1/9 sig	6/9 sig
Malaysia						
Wald Test	0.71	0.00*	0.00*	0.00*	0.00*	0.00*
No of T-stat sig	0/9 sig	4/9 sig	3/9 sig	9/9 sig	3/9 sig	8/9 sig
Philippines						
Wald Test	0.00*	0.25	0.00*	0.00*	0.00*	0.00*
No of T-stat sig	2/8 sig	1/8 sig	4/8 sig	3/8 sig	2/8 sig	1/8 sig
Singapore						
Wald Test	0.11	0.13	0.00*	0.00*	0.02*	0.00*
No of T-stat sig	2/12 sig	1/12 sig	8/12 sig	12/12 sig	2/12 sig	3/12 sig
Taiwan						
Wald Test	0.95	0.00*	0.02*	0.00*	0.06	0.00*
No of T-stat sig	0/8 sig	4/8 sig	2/8 sig	8/8 sig	2/8 sig	4/8 sig
Thailand						
Wald Test	0.64	0.00*	0.00*	0.00*	0.00*	0.00*
No of T-stat sig	0/9 sig	4/9 sig	4/9 sig	7/9 sig	4/9 sig	5/9 sig

Notes for Table 5.5(c)

i) 'Sig' represents Significant and '•' represents Significant at 5%..

ii) The number of companies used in the regressions across each time period is reported in Appendix 2 of Chapter 3.

5.7.3.3 P/Sales as Dependent Variable

Similarly, the regressions conducted using P/Sales as a dependent variable in Tables 5.6 (a), (b) and (c) confirm the prominent role of net profit margin in explaining the variability of P/Sales. The coefficients of net profit margin for each country are statistically significant across the sample time period using Wald Test at the 5% level.

P/Sales

Table 5.6(a) – Regressions based on Dependent Variable P/Sales against Independent Variables in Model A: Forecast Earnings Growth Rate

Country	Netdebtequity Ratio	Beta	IBES growth	Payout Ratio	Net Profit Margin
Hong Kong					
Wald Test	0.68	0.00*	0.00*	0.00*	0.00*
No of T-stat sig	0/12 sig	2/12 sig	2/12 sig	8/12 sig	12/12 sig
Indonesia					
Wald Test	0.96	0.02*	0.09	0.16	0.00*
No of T-stat sig	0/9 sig	3/9 sig	1/9 sig	1/9 sig	9/9 sig
Japan					
Wald Test	0.11	0.00*	0.00*	0.00*	0.00*
No of T-stat sig	3/12 sig	9/12 sig	9/12 sig	10/12 sig	12/12 sig
Korea					
Wald Test	0.00*	0.00*	0.03*	0.01*	0.00*
No of T-stat sig	5/9 sig	3/9 sig	2/9 sig	3/9 sig	9/9 sig
Malaysia					
Wald Test	0.49	0.00*	0.00*	0.00*	0.00*
No of T-stat sig	0/9 sig	1/9 sig	3/9 sig	7/9 sig	9/9 sig
Philippines					
Wald Test	0.93	0.65	0.02*	0.93	0.00*
No of T-stat sig	0/8 sig	0/8 sig	1/8 sig	0/8 sig	6/8 sig
Singapore					
Wald Test	0.42	0.01*	0.00*	0.00*	0.00*
No of T-stat sig	1/12 sig	1/12 sig	3/12 sig	7/12 sig	12/12 sig
Taiwan					
Wald Test	0.93	0.65	0.02*	0.93	0.00*
No of T-stat sig	1/8 sig	2/8 sig	3/8 sig	2/8 sig	8/8 sig
Thailand					
Wald Test	0.46	0.00*	0.09	0.00*	0.00*
No of T-stat sig	1/9 sig	5/9 sig	1/9 sig	4/9 sig	9/9 sig

Notes for Table 5.6(a)

i) 'Sig' represents Significant and '*' represents Significant at 5%..

ii) The number of companies used in the regressions across each time period is reported in Appendix 2 of Chapter 3.

P/Sales

Table 5.6(b)– Regressions based on Dependent Variable P/Sales against Independent Variables in Model B: Past Earnings & Past Sales Growth Rates

Country	Net Debt equity Ratio	Beta	Past eps growth	Payout Ratio	Net Profit Margin	Past Sales Growth
Hong Kong						
Wald Test	0.00*	0.00*	0.00*	0.00*	0.00*	0.00*
No of T-stat sig	3/12 sig	4/12 sig	6/12 sig	7/12 sig	12/12 sig	3/12 sig
Indonesia						
Wald Test	0.90	0.01*	0.00*	0.10	0.00*	0.00*
No of T-stat sig	0/9 sig	1/9 sig	3/9 sig	1/9 sig	9/9 sig	2/9 sig
Japan						
Wald Test	0.00*	0.00*	0.00*	0.00*	0.00*	0.00*
No of T-stat sig	5/12 sig	11/12 sig	10/12 sig	11/12 sig	12/12 sig	6/12 sig
Korea						
Wald Test	0.00*	0.00*	0.02*	0.04*	0.00*	0.00*
No of T-stat sig	3/9 sig	3/9 sig	1/9 sig	2/9 sig	8/9 sig	3/9 sig
Malaysia						
Wald Test	0.72	0.00*	0.31	0.00*	0.00*	0.00*
No of T-stat sig	1/9 sig	4/9 sig	1/9 sig	6/9 sig	9/9 sig	5/9 sig
Philippines						
Wald Test	0.84	0.92	0.00*	0.59	0.00*	0.13
No of T-stat sig	0/8 sig	0/8 sig	2/8 sig	0/8 sig	8/8 sig	1/8 sig
Singapore						
Wald Test	0.06	0.03*	0.00*	0.00*	0.00*	0.05
No of T-stat sig	3/12 sig	2/12 sig	1/12 sig	8/12 sig	12/12 sig	1/12 sig
Taiwan						
Wald Test	0.57	0.01*	0.03*	0.00*	0.00*	0.00*
No of T-stat sig	0/8 sig	3/8 sig	1/8 sig	1/8 sig	8/8 sig	2/8 sig
Thailand						
Wald Test	0.71	0.00*	0.09	0.00*	0.00*	0.00*
No of T-stat sig	0/9 sig	4/9 sig	1/9 sig	3/9 sig	9/9 sig	3/9 sig

Notes for Table 5.6(b)

i) 'Sig' represents Significant and '*' represents Significant at 5%..

ii) The number of companies used in the regressions across each time period is reported in Appendix 2 of Chapter 3.

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P/Sales

Table 5.6(c) – Regressions based on Dependent Variable P/Sales against Independent Variables in Model C: Past Earnings & Past Sales Growth Rates + Historical Price Performance

Country	Netdebtequity Ratio	Beta	Past eps growth	Payout Ratio	Net Profit Margin	Past sales growth	Past Price Performance
Hong Kong							
Wald Test	0.00*	0.00*	0.00*	0.00*	0.00*	0.00*	0.00*
No of T-stat sig	3/12 sig	6/12 sig	8/12 sig	7/12 sig	12/12 sig	5/12 sig	9/12 sig
Indonesia							
Wald Test	0.85	0.03*	0.00*	0.08	0.00*	0.00*	0.00*
No of T-stat sig	0/9 sig	2/9 sig	5/9 sig	1/9 sig	8/9 sig	2/9 sig	5/9 sig
Japan							
Wald Test	0.00*	0.00*	0.00*	0.00*	0.00*	0.00*	0.00*
No of T-stat sig	5/12 sig	10/12 sig	11/12 sig	10/12 sig	12/12 sig	3/12 sig	12/12 sig
Korea							
Wald Test	0.01*	0.00*	0.00*	0.02*	0.00*	0.01*	0.00*
No of T-stat sig	3/9 sig	3/9 sig	3/9 sig	3/9 sig	9/9 sig	2/9 sig	4/9 sig
Malaysia							
Wald Test	0.96	0.00*	0.00*	0.00*	0.00*	0.00*	0.00*
No of T-stat sig	0/9 sig	3/9 sig	1/9 sig	7/9 sig	9/9 sig	5/9 sig	8/9 sig
Philippines							
Wald Test	0.51	0.79	0.00*	0.82	0.00*	0.07	0.00*
No of T-stat sig	0/8 sig	0/8 sig	3/8 sig	0/8 sig	8/8 sig	1/8 sig	2/8 sig
Singapore							
Wald Test	0.03*	0.73	0.00*	0.00*	0.00*	0.01*	0.00*
No of T-stat sig	3/12 sig	0/12 sig	2/12 sig	10/12 sig	12/12 sig	3/12 sig	5/12 sig
Taiwan							
Wald Test	0.79	0.00*	0.06	0.00*	0.00*	0.01*	0.00*
No of T-stat sig	0/8 sig	2/8 sig	1/8 sig	1/8 sig	8/8 sig	1/8 sig	4/8 sig
Thailand							
Wald Test	0.40	0.04*	0.00*	0.00*	0.00*	0.00*	0.00*
No of T-stat sig	1/9 sig	2/9 sig	5/9 sig	3/9 sig	9/9 sig	3/9 sig	5/9 sig

Notes for Table 5.6(c)

i) 'Sig' represents Significant and '•' represents Significant at 5%..

ii) The number of companies used in the regressions across each time period is reported in Appendix 2 of Chapter 3.

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5.7.3.4 P/D as Dependent Variable

The regressions conducted on P/D (inverse of dividend yield) as dependent variable in Tables 5.7 (a), (b) and (c) do not show the prominent role of any single variable in explaining the variability of P/D. This is perhaps due to the fact that P/D is correlated to other valuation ratios such as P/E where payout ratio appears the most important determinant. Using Gordon's Growth Model based on dividend discount model, dividend yield is usually used as a starting point to determine the expected real rate of return of a firm after taking into consideration factors such as growth sustainability of a firm. Hence, none of the theoretical drivers play more of a prominent role in explaining the variability of P/D ratio.

P/D

Table 5.7(a) – Regressions based on Dependent Variable P/D against Independent Variables in Model A: Forecast Earnings Growth Rate

Country	Netdebtequity Ratio	Beta	IBES growth
Hong Kong			
Wald Test	0.08	0.08	0.62
No of T-stat sig	1/12 sig	2/12 sig	0/12 sig
Indonesia			
Wald Test	0.01*	0.00*	0.33
No of T-stat sig	2/9 sig	4/9 sig	0/9 sig
Japan			
Wald Test	0.00*	0.00*	0.01*
No of T-stat sig	6/12 sig	10/12 sig	2/12 sig
Korea			
Wald Test	0.09	0.00*	0.05
No of T-stat sig	3/9 sig	1/9 sig	1/9 sig
Malaysia			
Wald Test	0.83	0.00*	0.20
No of T-stat sig	0/9 sig	6/9 sig	1/9 sig
Philippines			
Wald Test	0.04*	0.04*	0.00*
No of T-stat sig	2/8 sig	1/8 sig	2/8 sig
Singapore			
Wald Test	0.09	0.21	0.00*
No of T-stat sig	2/12 sig	1/12 sig	2/12 sig
Taiwan			
Wald Test	0.00*	0.00*	0.01*
No of T-stat sig	3/8 sig	4/8 sig	1/8 sig
Thailand			
Wald Test	0.00*	0.00*	0.04*
No of T-stat sig	2/9 sig	2/9 sig	2/9 sig

Notes for Table 5.7(a)

i) 'Sig' represents Significant and '*' represents Significant at 5%..

ii) The number of companies used in the regressions across each time period is reported in Appendix 2 of Chapter 3.

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P/D

Table 5.7(b) – Regressions based on Dependent Variable P/D against Independent Variables in Model B: Past Earnings & Past Sales Growth Rates

Country	Netdebtequity Ratio	Beta	Past eps growth	Past Sales Growth
Hong Kong				
Wald Test	0.01*	0.00*	0.00*	0.72
No of T-stat sig	2/12 sig	3/12 sig	4/12 sig	1/12 sig
Indonesia				
Wald Test	0.01*	0.00*	0.00*	0.05
No of T-stat sig	1/9 sig	4/9 sig	2/9 sig	1/9 sig
Japan				
Wald Test	0.00*	0.00*	0.00*	0.00*
No of T-stat sig	6/12 sig	10/12 sig	9/12 sig	12/12 sig
Korea				
Wald Test	0.08	0.05	0.00*	0.10
No of T-stat sig	3/9 sig	1/9 sig	4/9 sig	2/9 sig
Malaysia				
Wald Test	0.81	0.00*	0.00*	0.00*
No of T-stat sig	0/9 sig	7/9 sig	4/9 sig	2/9 sig
Philippines				
Wald Test	0.62	0.65	0.72	0.10
No of T-stat sig	0/8 sig	0/8 sig	0/8 sig	2/8 sig
Singapore				
Wald Test	0.66	0.01*	0.00*	0.00*
No of T-stat sig	1/12 sig	2/12 sig	4/12 sig	3/12 sig
Taiwan				
Wald Test	0.89	0.00*	0.01*	0.53
No of T-stat sig	0/8 sig	6/8 sig	1/8 sig	0/8 sig
Thailand				
Wald Test	0.00*	0.00*	0.01*	0.00*
No of T-stat sig	1/9 sig	5/9 sig	2/9 sig	3/9 sig

Notes for Table 5.7(b)

i) 'Sig' represents Significant and '*' represents Significant at 5%..

ii) The number of companies used in the regressions across each time period is reported in Appendix 2 of Chapter 3.

P/D

Table 5.7(c) – Regressions based on Dependent Variable P/D against Independent Variables in Model C: Past Earnings & Past Sales Growth Rates + Historical Price Performance

Country	Netdebtequity Ratio	Beta	Past eps growth	Past Sales Growth	Past Price Performance
Hong Kong					
Wald Test	0.00*	0.00*	0.03*	0.17	0.00*
No of T-stat sig	2/12 sig	3/12 sig	2/12 sig	1/12 sig	4/12 sig
Indonesia					
Wald Test	0.14	0.00*	0.00*	0.06	0.00*
No of T-stat sig	1/9 sig	3/9 sig	2/9 sig	1/9 sig	4/9 sig
Japan					
Wald Test	0.00*	0.00*	0.00*	0.00*	0.00*
No of T-stat sig	6/12 sig	10/12 sig	5/12 sig	12/12 sig	12/12 sig
Korea					
Wald Test	0.26	0.06	0.00*	0.47	0.00*
No of T-stat sig	1/9 sig	2/9 sig	4/9 sig	0/9 sig	4/9 sig
Malaysia					
Wald Test	0.94	0.00*	0.00*	0.00*	0.00*
No of T-stat sig	0/9 sig	6/9 sig	3/9 sig	2/9 sig	6/9 sig
Philippines					
Wald Test	0.51	0.18	0.71	0.01*	0.10
No of T-stat sig	0/8 sig	1/8 sig	0/8 sig	2/8 sig	0/8 sig
Singapore					
Wald Test	0.49	0.79	0.00*	0.01*	0.00*
No of T-stat sig	1/12 sig	1/12 sig	2/12 sig	3/12 sig	5/12 sig
Taiwan					
Wald Test	0.67	0.00*	0.00*	0.79	0.00*
No of T-stat sig	0/8 sig	5/8 sig	2/8 sig	0/8 sig	4/8 sig
Thailand					
Wald Test	0.00*	0.00*	0.52	0.00*	0.00*
No of T-stat sig	1/9 sig	4/9 sig	1/9 sig	4/9 sig	4/9 sig

Notes for Table 5.7(c)

i) 'Sig' represents Significant and '*' represents Significant at 5%..

ii) The number of companies used in the regressions across each time period is reported in Appendix 2 of Chapter 3.

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Tables 5.4 – 5.7 show that the cross-sectional explanatory power of company specific variables and historical price performances vary across countries and time periods.

We do not present the signs and values of coefficients of the independent variables due to exhaustive amount of data, as regressions are conducted for 9 countries over each individual year in the sample period. The example below shows the unrestricted SUR regressions conducted in Hong Kong on P/B against variables identified in Model C over the sample period 1990-2001 which contain 84 regressors.

Table 5.8 - Coefficients of Regressions based on P/B against Independent Variables in Model C in Hong Kong

	Constant	Net Debt Equity Ratio	Beta	Past eps Growth	Payout Ratio	ROE	Past Sales Growth	Past Price Performance
1990	-0.008	0.144	-0.008	-0.001	0.338	10.906*	-0.001	0.002
1991	0.139	-0.085	-0.066	-0.006*	0.191	9.716*	0.002*	0.058*
1992	1.065*	-0.124	-0.504*	-0.009*	-0.082	11.983*	0.002	0.056
1993	0.440	-0.114	-0.866*	-0.001	0.803*	11.333*	0.005	0.186*
1994	0.390	-0.025	-0.135	-0.004*	0.455	8.254*	0.002	0.048*
1995	0.719*	0.232	0.017	-0.003*	0.249*	5.196*	0.000	0.110*
1996	0.449*	-0.188	-0.015	-0.003*	0.154	7.005*	0.002	0.074*
1997	-0.053	0.113	0.286*	-0.002*	0.710*	7.980*	0.003	0.134*
1998	0.654*	0.005	-0.016	0.000	0.184*	4.495*	0.000	0.056*
1999	0.405*	-0.257*	-0.101	-0.001	0.151*	5.368*	0.002	0.070*
2000	0.365	-0.401	0.434*	-0.002*	0.145	5.580*	0.003	0.142*
2001	0.140	-0.242*	0.308*	-0.002*	0.008	6.745*	0.003*	0.049*

Notes for Table 5.8

'*' implies coefficients are significant based on T-statistic at 5% level

The coefficients vary in unit size due the differences in scales of the independent variables

This further demonstrates that both significance and signs of the coefficients of the underlying variables vary across time.

We further conduct a preliminary investigation to see whether the differences between countries are attributable to noise or systematic factors.

For the purpose of this investigation we make use of the residuals from the regressions on P/B against variables identified in Model C. We compute the correlation matrix between residuals across country. We present the correlation matrix for the 9 countries over a sample period in time.

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Table 5.9 - Correlation Matrix of Residuals

Correlation matrix for Year 1995

	Hong Kong	Indonesia	Japan	Korea	Malaysia	Philippines	Singapore	Thailand	Taiwan
Hong Kong	1.00	-0.45	0.01	0.21	0.03	0.02	-0.11	0.08	0.02
Indonesia	-0.45	1.00	-0.01	-0.32	-0.13	-0.55	-0.08	0.10	-0.55
Japan	0.01	-0.01	1.00	0.22	0.04	-0.10	0.04	0.32	-0.10
Korea	0.21	-0.32	0.22	1.00	0.15	0.95	0.20	0.02	0.95
Malaysia	0.03	-0.13	0.04	0.15	1.00	0.78	-0.17	0.13	0.78
Philippines	0.02	-0.55	-0.10	0.95	0.78	1.00	-0.93	-0.35	0.92
Singapore	-0.11	-0.08	0.04	0.20	-0.17	-0.93	1.00	0.07	-0.92
Thailand	0.08	0.10	0.32	0.02	0.13	-0.35	0.07	1.00	0.35
Taiwan	0.02	-0.55	-0.10	0.95	0.78	0.92	-0.92	-0.35	1.00

Correlation matrix for Year 1996

	Hong Kong	Indonesia	Japan	Korea	Malaysia	Philippines	Singapore	Thailand	Taiwan
Hong Kong	1.00	-0.01	0.05	-0.42	-0.01	-0.65	-0.16	-0.03	-0.65
Indonesia	-0.01	1.00	0.26	-0.36	-0.01	0.05	-0.02	0.16	0.05
Japan	0.05	0.26	1.00	0.30	0.13	-0.13	0.10	0.18	-0.14
Korea	-0.42	-0.36	0.30	1.00	0.24	-0.55	0.20	0.02	-0.55
Malaysia	-0.01	-0.01	0.13	0.24	1.00	-0.14	-0.01	0.24	-0.14
Philippines	-0.65	0.05	-0.13	-0.55	-0.14	1.00	-0.16	-0.26	0.90
Singapore	-0.16	-0.02	0.10	0.20	-0.01	-0.16	1.00	-0.14	-0.16
Thailand	-0.03	0.16	0.18	0.02	0.24	-0.26	-0.14	1.00	-0.26
Taiwan	-0.65	0.05	-0.14	-0.55	-0.14	0.90	-0.16	-0.26	1.00

Correlation matrix for Year 1998

	Hong Kong	Indonesia	Japan	Korea	Malaysia	Philippines	Singapore	Thailand	Taiwan
Hong Kong	1.00	0.12	0.10	-0.02	-0.13	-0.04	-0.06	0.12	-0.04
Indonesia	0.12	1.00	-0.17	-0.87	-0.06	0.13	-0.38	-0.13	0.13
Japan	0.10	-0.17	1.00	0.09	0.15	-0.19	-0.15	-0.13	-0.19
Korea	-0.02	-0.87	0.09	1.00	0.15	0.12	0.35	0.42	0.12
Malaysia	-0.13	-0.06	0.15	0.15	1.00	0.10	0.38	0.23	0.10
Philippines	-0.04	0.13	-0.19	0.12	0.10	1.00	-0.01	-0.08	0.92
Singapore	-0.06	-0.38	-0.15	0.35	0.38	-0.01	1.00	-0.08	-0.02
Thailand	0.12	-0.13	-0.13	0.42	0.23	-0.08	-0.08	1.00	-0.08
Taiwan	-0.04	0.13	-0.19	0.12	0.10	0.92	-0.02	-0.08	1.00

Our analysis above covers periods before the Asian crisis and during the Asian crisis. We observe an increase in the negative relationship between Indonesia and Korea during the Asian crisis. This could have been due to fund flows out of Indonesian equity markets benefiting safer havens like Korea. Further, we also observe a significant positive relationship between Taiwan and Philippines both before and during the Asian crisis. Both the Philippines and Taiwan markets were probably influenced by investor sentiment and investment flows directed at the technology sectors during this period. However, the above preliminary investigation shows that the correlation coefficients of the residuals between countries are not significant in most cases. As a result, we conclude that the differences between countries are mainly attributable to noise.

We now highlight below how the significance of key variables such as ROE, net profit margin and payout ratio vary across country and time periods:

The **coefficients of ROE** are statistically significant using two-tailed T-statistics at the 5% level for at least 75% of the time periods in which the regressions are conducted against P/B as the dependent variable (see Tables 5.4 (a), (b) and (c)). The exceptions are Taiwan (Models A, B and C), Korea (Model C) and Philippines (Model C)

The **coefficients of payout ratio** are significant using two-tailed T-statistics at the 5% level for 100% of the time periods in which the regressions are conducted against P/E as the dependent variable ((see Tables 5.5 a, b and c). The exceptions are Indonesia (Models A, B and C), Philippines (Models A, B and C) and Thailand (Models A, B and C).

The **coefficients of net profit margin** are statistically significant using two-tailed T-statistics at the 5% level for 100% of the time periods in which the regressions are conducted against P/Sales as the dependent variable(see Tables 5.6 (a), (b) and (c)). The exceptions are Indonesia (Model C), Korea (Model B) and Philippines (Model A).

We provide probable reasons for exceptions noted above in specific countries:
Taiwan based on Models A, B and C have coefficients of ROE that are statistically significant at fewer time periods compared to its peers. Taiwan has significant exposure to TMT- technology, media and telecommunications sector.

During the TMT boom of the 90s, investors tend to rely on past price performance as an indication for future performance. Both analysts and investors tend to be over-optimistic influenced by past events and past price performance of stocks in the TMT sectors, hence paying a premium for past winners in the TMT sectors. This fuels the self-fulfilling TMT boom until investor realisation that the everlasting corporate growth, for the overpaid TMT stocks, is not sustainable. Besides, the Taiwan stock market is also dominated by retail investors with short term investment horizons. These investors do not focus on earnings sustainability driven by ROEs or other corporate fundamentals. They tend to focus on 'rumour' driven stocks which are perceived to have an upside potential.

Korea based on Model C has coefficients of ROE that are statistically significant at fewer time periods compared to its peers. Korea like Taiwan has significant exposure to TMT sector.This explains why the inclusion of expectations of growth based on past eps, past sales growth and past price performance do absorb the role of ROE for Korea based on Model C. Korea based on Model B has coefficients for net profit margin that are statistically significant at fewer time periods compared to its peers although relatively high at 89% of the time periods in which the regressions are conducted.

The coefficients of payout ratio for Indonesia, Philippines and Thailand generated from regressions on P/E as dependent variable against independent variables defined by Models A, B and C, are statistically significant fewer time periods compared to their peers. Indonesia, Philippines and Thailand are the smallest markets in the MSCI Far East ex Japan universe based on market capitalisation. These markets are affected by foreign fund flows as their domestic institutional pension funds are still relatively immature. These markets capture the interest of foreign funds when they are perceived to be cheap using widely available indicators such as P/E multiples. Hence, factors such as international investor sentiment driven by foreign fund flows may play more of a prominent role in explaining the variability of P/E ratio in Indonesia, Philippines and Thailand compared to the theoretical drivers of P/E - company fundamentals such as payout ratio, growth prospects and stock specific risks.

Similarly, Indonesia based on Model C has coefficients for net profit margin that are statistically significant at fewer time periods compared to its peers although relatively high at 89% of the time periods in which the regressions against P/Sales are conducted. Philippines based on Model A has coefficients for net profit margin that are statistically significant at fewer time periods compared to its peers although relatively high at 75% of the time periods in which the regressions against P/Sales are conducted. Philippines based on Model C has coefficients for ROE that are statistically significant at fewer time periods compared to its peers.
The inclusion of expectations of growth based on past earnings growth, past sales growth and past price performance as defined in Model C do absorb the role of ROE for Philippines based on Model C. Foreign fund flows usually do maintain their trend until local issues such as political, fiscal and currency stability deteriorate causing a repatriation of funds. Thus, past price performance do absorb the role of ROE in explaining the variability of P/E ratio.

The above analysis confirms Hypothesis II that cross-sectional explanatory power of company specific variables (corporate fundamentals, corporate growth expectations and stock specific risks) and historical price performance vary across countries and time periods.

We also observe in Table 5.10 that the contribution to the variability of P/B, P/E, P/Sales and P/D differ using different models based on historical data or a mix of historical and forecasts data as defined in Models A,B and C. Schwarz Criterion provides a measure of information that strikes a balance between the 'goodness of fit' on the dependent variable and parsimonious specification of the model. Smaller values of Schwarz Criterion are preferred. The results in Table 5.10 analysed for each dependent variable are as follows:

Table 5.10 – Computations of Schwarz Criterion on Various Models

Model	P/B	P/E	P/Sales	P/DPS
Hong Kong				
A	-2.0996	0.0698	-1.4456	0.9042
B	-2.1456	0.1245	-1.4356	0.7325
C	-2.2159	0.0709	-1.4848	0.8769
Indonesia				
A	-1.6483	0.1634	-1.5795	2.6348
B	-1.69763	0.3065	-1.6384	2.8248
C	-1.7580	0.1693	-1.6885	2.7856
Japan				
A	-2.0680	0.7697	-2.5802	1.7094
B	-2.0896	0.7641	-2.6128	1.7324
C	-2.1747	0.7162	-2.6684	1.6361
Korea				
A	-2.4390	0.3898	-2.6911	2.6298
B	-2.4587	0.3860	-2.7439	2.5792
C	-2.4977	0.3391	-2.8054	2.5562
Malaysia				
A	-1.9138	0.5458	-1.2969	2.0524
B	-1.9239	0.6117	-1.2015	2.0081
C	-2.0202	0.5835	-1.2579	1.9837
Philippines				
A	-1.8379	0.3970	-1.3076	3.7892
B	-1.9258	0.3832	-1.0146	4.6657
C	-1.9611	0.3382	-1.0745	4.6759
Singapore				
A	-2.2788	0.4465	-1.6665	1.6564
B	-2.2909	0.4456	-1.6065	1.5964
C	-2.3629	0.4247	-1.6527	1.5667
Taiwan				
A	-1.6415	0.5952	-1.6937	1.9761
B	-5.4545	0.5763	-1.8880	1.7965
C	-1.6131	0.5351	-1.9486	1.7593
Thailand				
A	-1.9766	0.0613	-1.0639	1.0698
B	-2.0446	0.0736	-1.8010	1.3545
C	-2.1347	0.0159	-1.8730	1.2942

Notes for Table 5.10

Model C based on P/B in Taiwan uses data period from 6/1995-6/2001. There was inadequate observation in Year 1994 to run SUR regression using the unrestricted option.

P/B

The results show that the values of Schwarz Criterion are in descending order for Models A, B and C respectively. This indicates that Model B is preferred over Model A and Model C based on historical data is the most preferred in defining a goodness of fit on the dependent variable, P/B.

The exception is observed in Taiwan where Model B is the most preferred. It has to be noted that Model C in Taiwan uses the shortest data period from 6/1995-6/2001 compared to Models A and B that use data periods beginning from 6/1994. There are inadequate observations in 1994 to run SUR regressions using the unrestricted option based on Model C.

P/E

The results show that five out of nine countries have values of Schwarz Criterion lower for Model B compared to Model A. This indicates that Model B is preferred over Model A.

The results show that six out of nine countries have the lowest Schwarz Criterion values for Model C suggesting that Model C based on historical data is the most preferred in defining goodness of fit on the dependent variable, P/E.

P/Sales

The results show that five out of nine countries have values of Schwarz Criterion lower for Model B compared to Model A. This indicates that Model B is preferred over Model A. A total of seven out of nine countries have the lowest Schwarz Criterion values for Model C suggesting that Model C based on historical data is the most preferred in defining goodness of fit on the dependent variable, P/Sales.

Dividend Yield (P/D)

The results show that five out of nine countries have values of Schwarz Criterion lower for Model B compared to Model A. This indicates that Model B is preferred over Model A. The results show that five out of nine countries have the lowest Schwarz Criterion values for Model C suggesting that Model C based on historical data is the most preferred in defining goodness of fit on the dependent variable, dividend yield.

In summary,.the above results confirm that Model B (based on historical data) using expectations of growth based on past 1 year actual earnings growth rate and past 1 year actual sales growth rate provide additional contribution to the variability of P/B, P/E, P/Sales and P/D compared to Model A (based on a combination of historical and forecast data). Model C (based on historical data) which includes the addition of historical price performance to the variables in Model B provides additional contribution to the variability of P/B, P/E, P/Sales and P/D. Hence Model C which is based on historical data is most preferred model in explaining the variability of P/B, P/E, P/Sales and P/D. However, the model that best explains the variability of P/B, P/E, P/Sales and P/D may not necessarily be the one that provides the best predictor of future returns. We determine this in the next section.

Section 5.8 establishes whether an investment strategy which uses the combination of theoretical drivers based on historical data or a mix of historical and forecasts data is a better predictor of future returns of value and growth stocks compared to an investment strategy which uses valuation ratios based on single factor variables such as P/B, P/E, P/Sales and P/D. We also determine whether the strategy based on the theoretical drivers exceeds the performance of commonly used benchmarks such as MSCI or Citigroup Indices. We further extend the analysis to determine the combination of theoretical drivers that maximises the performance of value and growth stocks.

5.8 Performance of Value and Growth Stocks based on Theoretical Drivers

Section 5.8.1 summarises the performances of portfolios constructed. It compares the performances of value and growth portfolios constructed using the theoretical drivers against respective portfolios of value and growth stocks determined by single factor valuation ratios such as P/B, P/E, P/Sales or P/D (inverse dividend yield). It also compares the respective performances of portfolios selected using investment strategies based on Model A (combination of historical and forecasts data), Model B (historical data) and Model C (historical data similar to Model B with historical price performance as an additional variable).

Section 5.8.2 describes a selection of single factor and multi-factor Value and Growth Indices commonly used by the investment industry.

In Section 5.8.3, we analyse whether the performances of value and growth portfolios constructed using the theoretical drivers exceeds the performances of commonly used benchmarks such as MSCI/Citigroup Indices. We also aim to determine the combination of theoretical drivers that maximises the performance of value and growth stocks.

We document our conclusions in Section 5.8.4.

5.8.1 Portfolio Analysis: Equally Weighted Portfolios

The results of average monthly returns for equally weighted value and growth portfolios constructed using single factor valuation ratios as well as constructed using a combination of theoretical drivers are summarised in Tables 5.11 – 5.14. (Tables I-IV in Appendix 1 summarise the results of average monthly returns for market capitalisation weighted value and growth portfolios).

Before we proceed to analyse the comparison of performances of "P/B", "P/E", "P/Sales" and "P/D" Composite value/growth portfolios constructed using the theoretical drivers against the respective portfolios determined using single factor valuation ratios, we provide below a summary of our results based on Tables 5.11-5.14.

A summary analysis of the results based on average monthly returns in Tables 5.11-5.14 is as follows:

- Single factor valuation ratios such as P/B, P/E, P/Sales and P/D (inverse dividend yield) used in constructing value portfolios produce superior returns compared to respective multi-factor composite Models A (based on a combination of historical and forecasts data) and B (based on historical data).

- However, value portfolios constructed using Model C (which includes all the variables in Model B in addition to 'historical price performance') shows improved performance when compared to value portfolios selected using Models A and B.

  Nonetheless, value portfolios selected using Model C show broadly similar performance when compared to value portfolios selected using counterpart single factor valuation ratios P/B, P/E, P/Sales and P/D respectively. As a result, we are able to conclude that given Model C is the most preferred in defining goodness of fit and explaining the variability of P/B, P/E, P/Sales and P/D, one can expect the performance of portfolios based on Model C to be similar as that by P/B, P/E, P/Sales and P/D.

- Growth portfolios constructed using multi-factor composite Models A and B have higher average monthly returns (and average monthly risk adjusted returns) compared to growth portfolios constructed using counterpart single variables P/B, P/E, P/Sales and P/D respectively. Growth portfolios constructed by Model A record higher average monthly returns (and monthly risk adjusted returns) compared to average monthly returns of growth portfolios constructed using Model B.

This leads to the conclusion that Model A (based on a combination of historical and forecasts data) is a better predictor of future returns of growth stocks both on an absolute and risk adjusted basis compared to respective single factor valuation ratio variable P/B, P/E, P/Sales or P/D. A growth investment strategy using Model A shows better performance than a single factor valuation ratio due to the following:

Model A uses a combination of historical and forecasts data to estimate the composite factor valuation ratio. Model A is driven by fundamental drivers whereas single factor valuation ratios are driven by 'Price' as a dominant variable. Inherently, 'Price' is affected by market expectations which may be driven by irrational exuberance or pessimism. Therefore, the results of Model A are a better basis for formulating investment strategies for Growth stocks.

We denote value and growth portfolios within Tables 5.11-5.14, by the acronyms V and G respectively and the difference between them is depicted by acronyms V-G. The first row for each country is the average monthly return (AR). The second row is the standard deviation of monthly returns in (parentheses) or t-statistic testing whether V-G is different from zero in [brackets]. The third row is the risk adjusted returns (RR) which is the ratio of AR to standard deviation of monthly returns.

Each table shows the performances of value and growth stocks sorted on "P/B", "P/E", "P/Sales" and "P/D" multi-factor composite values. These respective composite values are calculated using coefficient estimates obtained from regressions on dependent variables P/B, P/E, P/Sales, P/D (inverse of dividend yield) against the set of independent theoretical drivers defined in Models A, B and C. Two options are used in regressions for the determination of the coefficient estimates – unrestricted (coefficients vary across time) and restricted (coefficient remains constant across time) models. Tables 5.11-5.14 report results using coefficient estimates derived from the unrestricted option used in the regressions, which represents our preferred option as discussed in Section 5.4.2. Results using coefficient estimates derived from the restricted option are shown in Appendix 2. Columns 2, 3 and 4 show results of value and growth portfolios sorted on "P/B", "P/E", "P/Sales" and "P/D" multi-factor composite values using variables defined in Models A, B and C respectively. Column 5 shows the results of value and growth portfolios sorted on single factor valuation ratios P/B, P/E, P/sales and P/D.

The sections below provide in-depth analysis of the performances of value and growth portfolios determined using multi-factor composite valuation criteria - "P/B", "P/E", "P/Sales" and "P/D" Composites based on Models A, B and C.

5.8.1.1 "P/B" Composite: Multi-factor Composite computed by Multiplying the Theoretical Drivers with the Coefficient Estimates obtained from Regressions using P/B as Dependent Variable (Table 5.11)

We observe the following results for Model A (based on a combination of historical and forecast data), Model B (based on historical data) , a comparison of results for Model A vs Model B and results of Model C (which includes all the variables in Model B in addition to historical price performance):

Model A – combination of historical and forecast data

Key results observed for value portfolios and value-growth spreads are summarised below:

- Value portfolios constructed using Model A in all countries except Korea, record lower average monthly returns (and average risk adjusted monthly returns) than the value stocks defined by single factor valuation ratio P/B.

The probable reasons that Korea is an exception are due to the fact that Korea has significant exposure to TMT - technology, media and telecommunications sector as well as domestic industrial and auto sectors. Analysts tend to be overoptimistic in their growth forecasts for TMT stocks as they are influenced by past events for stocks in TMT sectors. Hence, analysts tend to assign a premium on growth forecasts for past winners in the TMT sectors. On the other hand, during the TMT boom of the later half of the 90s, analysts tended to be overpessimistic on domestic industrial and auto sectors due to financial problems of stocks in these sectors. Model A uses analysts forecast expectations. Overoptimistic and overpessimistic forecasts cause expectational errors leading to mis-pricing. Therefore, an investment strategy using Model A tends to exploit the mis-pricing of expectational error caused by overoptimistic/overpessimistic forecasts. This mis-pricing causes value stocks to be underpriced and growth stocks to be overpriced. Hence, "P/B" composite based on Model A is a better predictor of value stocks with upside growth potential in this market compared to the use of single factor valuation ratio P/B.

Table 5.11 – Monthly Returns for Equally Weighted Value and Growth Portfolios Sorted on "P/B" Composite and Single Factor Valuation Ratio P/B

	P/B MODEL A			P/B MODEL B			P/B MODEL C			P/B		
	V	G	V-G	V	G	V-G	V	G	V-G	V	G	V-G
Hong Kong 6/90-6/2001												
AR	0.98	0.78	0.20	1.11	0.70	0.41	1.10	0.77	0.33	1.13	0.77	0.36
	(10.67)	(8.33)	[0.52]	(10.44)	(8.54)	[1.02]	(10.63)	(8.95)	[0.75]	(10.11)	(8.48)	[0.87]
RR	0.09	0.09		0.106	0.08		0.10	0.08		0.11	0.09	
Indonesia 6/93-6/2001												
AR	0.31	0.10	0.21	0.67	0.15	0.53	1.16	-0.25	1.41	1.15	-0.12	1.27
	(14.38)	(10.39)	[0.22]	(14.75)	(10.69)	[0.55]	(18.03)	(11.23)	[1.05]	(16.68)	(10.68)	[1.05]
RR	0.02	0.01		0.05	0.014		0.06	-0.02		0.07	-0.01	
Japan 6/90 – 6/2001												
AR	-0.39	-0.47	0.08	-0.42	-0.51	0.09	-0.36	-0.58	0.22	-0.35	-0.63	0.28
	(6.90)	(6.88)	[0.48]	(6.99)	(6.95)	[0.55]	(7.27)	(6.72)	[1.05]	(7.03)	(6.89)	[1.40]
RR	-0.06	-0.07		-0.06	-0.07		-0.05	-0.09		-0.05	-0.09	
SAAR												
Korea 6/93 – 6/2001												
AR	0.06	-0.19	0.26	0.00	-0.21	0.21	0.19	-0.39	0.58	-0.11	-0.49	0.38
	(12.61)	(11.87)	[0.49]	(12.38)	(11.70)	[0.42]	(12.91)	(11.27)	[0.92]	(13.42)	(11.43)	[0.50]
RR	0.00	-0.02		0.00	-0.02		0.01	-0.03		-0.01	-0.04	
Malaysia 6/93 – 6/2001												
AR	0.45	-0.07	0.52	0.50	-0.27	0.77	0.57	-0.20	0.78	0.81	-0.28	1.10
	(16.27)	(10.84)	[0.77]	(16.24)	(10.84)	[1.05]	(15.80)	(11.16)	[1.10]	(14.96)	(10.85)	[1.75]
RR	0.03	-0.01		0.031	-0.025		0.04	-0.02		0.05	-0.03	
Philippines 6/94 – 6/2001												
AR	-0.65	-0.54	-0.11	-0.33	-0.80	0.47	-0.43	-0.80	0.38	-0.19	-0.50	0.31
	(14.86)	(9.01)	[-0.12]	(13.84)	(10.15)	[0.56]	(15.57)	(9.39)	[0.35]	(14.64)	(9.93)	[0.34]
RR	-0.04	-0.06		-0.02	-0.08		-0.03	-0.09		-0.01	-0.05	
Singapore 6/90 - 6/2001												
AR	0.42	0.69	-0.27	0.48	0.77	-0.29	0.65	0.67	-0.02	0.67	0.38	0.29
	(10.66)	(8.31)	[-0.70]	(10.70)	(8.23)	[-0.72]	(11.16)	(8.00)	[-0.05]	(10.67)	(8.48)	[0.65]
RR	0.04	0.08		0.05	0.09		0.06	0.08		0.06	0.04	
Taiwan 6/94 - 6/2001												
AR	-0.82	0.67	-1.48	-0.44	0.08	-0.52	-0.54	0.23	-0.76	-0.45	-0.07	-0.38
	(8.62)	(9.17)	[-2.32]	(9.01)	(8.48)	[-0.87]	(9.19)	(9.75)	[-1.02]	(9.16)	(9.40)	[-0.53]
RR	-0.09	0.07		-0.05	0.01		-0.06	0.02		-0.05	-0.01	
Thailand 6/93 - 6/2001												
AR	0.18	-0.50	0.68	0.09	-0.50	0.59	0.34	-0.89	1.24	1.21	-1.35	2.56
	(10.39)	(10.98)	[0.88]	(11.30)	(12.27)	[0.64]	(12.54)	(10.46)	[1.32]	(12.68)	(10.23)	[2.74]
RR	0.02	-0.05		0.01	-0.04		0.03	-0.08		0.10	-0.13	

Notes for Table 5.11

Value and growth portfolios are formed on various models based on "P/B" Composite ratio as well as single factor valuation ratio P/B. Firms are weighted equally within each portfolio. We denote value (stocks in fractile 1) and growth (stocks in fractile 3) portfolios by V and G respectively and the difference between them V-G. The first row for each country is the average monthly return (AR). The second is the standard deviation of monthly returns in (parentheses) or t – statistic testing whether V-G is different from zero in [brackets]. The third row is the risk adjusted returns (RR) which is the ratio of AR to standard deviation of monthly returns.

Model C based on P/B in Taiwan uses data period from 6/1995-6/2001. There was inadequate observation in Year 1994 to run SUR regression using the unrestricted option.

We make use of the same set of companies for "P/B" Composite based on Model A, B and C as well as P/B. This allows comparison of performance across the different strategies. The number of companies are reported in Appendix 4 of Chapter 3.

- The value-growth spread in each country computed using Model A is lower than the value-growth spread based on single factor valuation ratio P/B. For example, value-growth spread in Hong Kong (column 2) is 0.20%, which is lower compared to value-growth spread based on single factor valuation ratio P/B (column 5) at 0.36%.

This suggests that "P/B" composite is not effective in distinguishing between value and growth stocks. This suggests that different composites may need to be used to construct value and growth stocks separately.

Key results observed for Growth portfolios are summarised below:

- Growth portfolios based on Model A in all countries with the exception of Philippines record higher average monthly returns (and average risk adjusted monthly returns) compared to growth portfolios defined by single factor valuation ratio P/B.

We observe that the Philippines stock market is a notable exception in the above results. The Philippines market (based on market capitalisation) is one of the smallest in the MSCI Far East ex Japan universe. This market is affected by foreign fund flows. The effects of foreign fund flows (driven by local issues) are more noticeable in Philippines, as it does not have export oriented resource rich companies which have earnings sustainability despite domestic issues (e.g. a resource rich country such as Indonesia which has also been affected by local issues – political upheavals but the export oriented resource rich companies show earnings sustainability). The Philippines market captures the interest of foreign funds when it is perceived to be 'cheap' using widely available indicators such as P/B, P/E, etc. A market driven by foreign fund flows provides plausible explanation why the single factor valuation ratio P/B seems to be a better predictor of future performance of companies in Philippines compared to a composite model driven by fundamental drivers.

Model B – historical data

Key results observed for value portfolios and value-growth spreads are summarised below:

- Value portfolios based on Model B in seven out of nine countries record lower average monthly returns (and average risk adjusted monthly returns) compared to value portfolios defined by single factor valuation ratio P/B. The exceptions are Korea and Taiwan.

We observe that the Korea and Taiwan stock markets are notable exceptions. As explained, Korea and Taiwan markets have significant exposure to TMT - technology, media and telecommunications sector as well as domestic industrial sectors. During much of the TMT boom of the 90s investors tend to pay a premium for past winners of TMT stocks but pay a discount to the domestic industrial sectors. Studies have shown that extrapolation of past performance to expectations future growth causes expectational error because growth rates mean-revert. Model B uses expectations of growth based on extrapolation of past performance of earnings and sales. Perhaps, value stocks defined by Model B exploits the mis-pricing in stocks caused by expectational error. Single factor valuation ratio P/B is not able to exploit the mispricing in the stocks because of the long cycles that both TMT and industrial sectors tend to have. Hence, Model B is a better predictor of value stocks with upside growth potential in these markets compared to just single factor valuation ratio P/B.

- The value-growth spread in seven out of nine countries computed using Model B is lower than the value-growth spread based on single factor valuation ratio P/B.

Key results observed for Growth portfolios are summarised below:

- Growth portfolios based on Model B in seven out of nine countries record higher average monthly returns (and average risk adjusted monthly returns) than growth portfolios defined by single factor valuation ratio P/B.

Growth portfolios based on Model B in Hong Kong and Philippines (the other two of the nine countries) record lower average monthly returns compared to growth portfolios defined by a single factor valuation ratio P/B; this causes their value-growth spreads to be larger as mentioned above.

The Hong Kong stock market is dominated by a few large stable local blue chip companies, which trade at higher valuations e.g. P/B or P/E. These local blue chips meet the criteria of institutional investors and are therefore traded at a premium. The rest of the market is flooded with a large number of companies with lower valuations e.g. P/B or P/E. The market is also dominated by retail investors with very short term investment horizons ('punters'). The punters tend to focus on 'rumour' driven stocks, which are perceived to have an upside potential. The punters do not focus on earnings sustainability or other fundamentals. As a result growth stocks defined by Model B (based on historical data) do not record higher average monthly returns compared to growth stocks defined by single factor valuation ratio P/B which reflect high growth expectations and tend to be chased by the market and its 'punters'.

As explained earlier, the Philippines market which is driven by foreign funds flow makes the single factor valuation ratio P/B seems to be a better predictor of future performance of companies (value and growth) in Philippines compared to composite valuation criteria based on fundamental drivers. Foreign funds flows are driven by more sophisticated institutional investors who tend to focus on forward looking growth expectations instead of extrapolating the past. It would be difficult to rely on past performance as events do rapidly change in Philippines thereby altering the fundamentals of companies. Hence, Model A is a better predictor of future performance of growth stocks compared to Model B as observed by the higher average monthly returns shown by growth stocks defined by Model A.

• **Comparison between Model A and Model B**

Firstly, we observe that value portfolios based on Models A and B record lower average monthly returns (and average risk adjusted monthly returns) compared to value portfolios defined by single factor valuation ratio P/B as evidenced by following:

- Value portfolios constructed using Model A record lower average monthly returns in eight out of nine countries

- Value portfolios constructed using Model B record lower average monthly returns in seven out of nine countries

This indicates that the P/B method of defining value stocks produces superior returns compared to Models A and B. Perhaps, both Models A and B do not include the 'cheap' factor – price element in capturing the upside price potential of its value stocks. Thus, the single factor valuation ratio P/B seems to be a better predictor of future performance of value stocks. P/B ratio reflects a combination of historical and market perceptions about the future growth potential of stocks. Some of that perception may be extrapolated from historical performance which may be either overoptimistic or overpessimistic causing mispricing. An investment strategy which exploits that mispricing produces superior returns.

Secondly, we observe a reversal of above observations for growth portfolios.
We determine that growth portfolios constructed using Models A and B record higher average monthly returns (and average monthly risk adjusted returns) compared to growth portfolios defined by single factor valuation ratio P/B as evidenced by following:

- Growth portfolios constructed using Model A record higher average monthly returns in eight out of nine countries

- Growth portfolios constructed using Model B record higher average monthly returns in seven out of nine countries

Thirdly, we observe that growth portfolios constructed using Model A record higher average monthly returns and average monthly risk adjusted returns compared to growth portfolios constructed using Model B. This is evidenced by the fact that the average monthly returns of growth portfolios constructed using Model A in six out of nine countries are higher than growth portfolios constructed using Model B.

Fourthly, we confirm that although Model B explains the variability of P/B better than Model A (as observed by the results in Table 5.11), Model A which uses a combination of historical and forecast data is a better predictor of future returns of growth stocks both on an absolute and risk adjusted basis. Single factor valuation ratio may reflect too much optimism causing its growth stocks to be overpriced and therefore is not able to capture much return upside as compared to value stocks defined by Model A.

Model C – historical data + historical price performance
Model C is an extension of Model B. Model C which includes all the variables in Model B and an additional variable 'historical price performance'.
We observe that value portfolios selected using Model C shows improved performance when compared to value portfolios constructed using Models A and B.
We further observe that Model C records the lowest Schwarz Criterion value compared to Models A and B. This indicates that Model C has the best fit to P/B even after Model C is adjusted by a penalty for additional coefficients.

This reinforces our initial assumption that there is a need to capture the relationship between the intrinsic value of a stock and its price, especially for value stocks. This is supported by the fact that a value investor relies on the underestimation of the current worth to drive its share price higher. Therefore, the issue of 'entry point' for a stock is important to maximise the upside potential price performance of the stock.

Further, this analysis confirms the results of studies, which show that extrapolation of past performance leads to 'expectational error' because growth rates mean-revert. Expectational error causes a certain degree of mispricing that underprices value stocks and overprices growth stocks. This results in underpriced value stocks, with poor past performance, as investors do not perceive any improvement in both the operational and financial performance of these companies. Likewise, growth stocks tend to be overpriced because investors and analysts continue to extrapolate the past performance of these stocks into the foreseeable future. Model C, exploits this mis-pricing in stocks caused by expectational error.

The results of value portfolios based on Model C (column 4) in six out of nine countries record higher average monthly returns compared to value portfolios based on Models A and B. The three exceptions are Hong Kong, Philippines and Taiwan.

Value portfolios based on Model C (column 4) in 5 countries record broadly similar average monthly returns compared to value portfolios based on single variable P/B (column 5). They differ in the narrow range of ± (0.01% to 0.1%). The above results are similar when average monthly risk adjusted returns are used.

We conclude that the results for Model C and P/B are broadly the same. We are not able to conclude that Model C, when compared to single variable P/B, is a better (or worse) predictor of future returns of value stocks based on average monthly returns and average monthly risk adjusted returns. But we are able to conclude that given Model C is the most preferred in defining goodness of fit and explaining the variability of P/B, P/E, P/Sales and P/D, one can expect the performance of portfolios based on Model C to be similar as that by P/B, P/E, P/Sales and P/D.

5.8.1.2 "P/E" Composite: Multi-factor Composite computed by Multiplying the Theoretical Drivers with the Coefficient Estimates obtained from Regressions using P/E as Dependent Variable (Table 5.12)

We observe the following results for Model A (based on a combination of historical and forecast data , Model B (based on historical data), a comparison of results for Model A vs Model B and results of Model C (which includes all the variables in Model B in addition to historical performance):

Model A – combination of historical and forecast data

Key results observed for value-portfolios and value-growth spreads are summarised below:

- Value portfolios computed using Model A in all countries with the exception of Hong Kong record lower average monthly returns (and average risk adjusted monthly returns) than value portfolios defined by single factor valuation ratio P/E.

- Value-growth spreads in all countries computed using Model A are lower than value-growth spreads based on single factor valuation ratio P/E. This suggests that "P/E" composite is not effective in distinguishing between value and growth stocks.
  This suggests that different composites may need to be used to define value and growth stocks separately.

Key results observed for Growth portfolios are summarised below:

- Growth portfolios based on Model A in all countries record higher average monthly returns compared to growth portfolios defined by single factor valuation ratio P/E.

- Similarly, growth portfolios based on Model A in each of the 9 countries record higher average monthly risk adjusted returns compared to growth portfolios based on single factor valuation ratio P/E.

Chapter 5 – Fundamental Drivers of Value and Growth Stocks

Table 5.12– Monthly Returns for Equally Weighted Value and Growth Portfolios Sorted on "P/E" Composite and Single Factor Valuation Ratio P/E

	P/E MODEL A			P/E MODEL B			P/E MODEL C			P/E		
	V	G	V-G	V	G	V-G	V	G	V-G	V	G	V-G
Hong Kong 6/90-6/2001												
AR	1.05	0.75	0.30	1.17	0.60	0.57	1.25	0.48	0.77	1.00	0.63	0.37
	(9.65)	(8.90)	[1.06]	(9.63)	(8.86)	[1.91]	(9.89)	(9.35)	[2.29]	(9.71)	(9.23)	[1.15]
RR	0.11	0.08		0.12	0.07		0.13	0.05		0.10	0.07	
Indonesia 6/93-6/2001												
AR	-0.15	0.28	-0.43	0.65	0.78	-0.13	1.12	-0.47	1.59	0.75	-0.49	1.25
	(12.76)	(13.60)	[-0.61]	(11.68)	(15.99)	[-0.13]	(13.67)	(12.64)	[1.75]	(13.86)	(11.92)	[1.84]
RR	-0.01	0.02		0.06	0.05		0.08	-0.04		0.05	-0.04	
Japan 6/90 - 6/2001												
AR	-0.38	-0.53	0.15	-0.40	-0.54	0.14	-0.48	-0.54	0.07	-0.30	-0.65	0.35
	(6.69)	(7.41)	[0.74]	(6.73)	(7.41)	[0.75]	(6.89)	(7.36)	[0.37]	(6.69)	(7.28)	[1.80]
RR	-0.06	-0.07		-0.06	-0.07		-0.07	-0.07		-0.04	-0.09	
Korea 6/93 - 6/2001												
AR	0.06	-0.16	0.22	0.22	-0.29	0.52	0.26	-0.41	0.67	0.23	-0.37	0.60
	(11.54)	(12.47)	[0.76]	(11.83)	(12.29)	[1.74]	(12.46)	(11.84)	[1.60]	(12.45)	(12.38)	[1.10]
RR	0.00	-0.01		0.02	-0.02		0.02	-0.03		0.02	-0.03	
Malaysia 6/93 - 6/2001												
AR	0.05	0.39	-0.34	0.40	0.22	0.18	0.44	0.29	0.15	0.83	-0.33	1.16
	(13.96)	(12.33)	[-0.85]	(13.94)	(12.59)	[0.41]	(14.18)	(12.55)	[0.33]	(13.52)	(13.15)	[3.30]
RR	0.00	0.03		0.03	0.02		0.03	0.02		0.06	-0.03	
Philippines 6/94 - 6/2001												
AR	-0.03	-0.56	0.53	-0.50	-0.54	0.04	-0.60	-0.31	-0.28	0.36	-1.35	1.73
	(13.68)	(10.99)	[0.71]	(14.60)	(9.78)	[0.05]	(14.01)	(9.56)	[-0.35]	(14.24)	(11.26)	[2.28]
RR	-0.00	-0.05		-0.03	-0.05		-0.04	-0.03		0.03	-0.12	
Singapore 6/90 - 6/2001												
AR	0.73	0.31	0.42	0.80	0.42	0.38	0.88	0.29	0.59	0.99	0.22	0.78
	(9.57)	(9.63)	[1.71]	(9.60)	(9.88)	[1.30]	(10.14)	(8.95)	[2.14]	(9.39)	(10.00)	[2.60]
RR	0.08	0.03		0.08	0.04		0.09	0.03		0.11	0.02	
Taiwan 6/94 - 6/2001												
AR	-0.43	-0.41	-0.03	-0.19	-0.15	-0.04	-0.21	-0.28	0.08	0.01	-0.60	0.61
	(8.91)	(8.87)	[-0.05]	(8.88)	(8.70)	[-0.08]	(8.87)	(9.06)	[0.15]	(8.33)	(9.13)	[1.25]
RR	-0.05	-0.05		-0.02	-0.02		-0.02	-0.03		0.00	-0.07	
Thailand 6/93 - 6/2001												
AR	0.64	-0.73	1.38	-0.12	-0.41	0.30	0.95	-1.03	2.00	0.97	-1.41	2.41
	(12.98)	(9.22)	[1.49]	(12.09)	(11.55)	[0.32]	(13.73)	(10.17)	[1.84]	(13.41)	(9.39)	[2.53]
RR	0.05	-0.08		-0.01	-0.04		0.07	-0.10		0.07	-0.15	

Notes for Table 5.12

Value and growth portfolios are formed on various models based on "P/E" Composite ratio as well as single factor valuation ratio P/E. Firms are weighted equally within each portfolio. We denote value (stocks in fractile 1) and growth (stocks in fractile 3) by V and G respectively and the difference between them V-G. The first row for each country is the average monthly return (AR). The second is the standard deviation of monthly returns in (parentheses) or t – statistic testing whether V-G is different from zero in [brackets]. The third row is the risk adjusted returns (RR) which is the ratio of AR to standard deviation of monthly returns.

We make use of the same set of companies for "P/E" Composite based on Model A, B and C as well as P/B. This allows comparison of performance across the different strategies. The number of companies are reported in Appendix 4 of Chapter 3.

Model B – historical data

Key results observed for value- portfolios, growth portfolios and value-growth spreads are summarised below:

- Value portfolios constructed using Model B in all countries with the exception of Hong Kong show lower average monthly returns (and average risk adjusted monthly returns) than the value portfolios defined by single factor valuation ratio P/E.

- Growth portfolios based on Model B for all countries with the exception of Hong Kong record higher average monthly returns (and average risk adjusted monthly returns) than growth portfolios defined by single factor valuation ratio P/E.

- Value-growth spreads based on Model B for all countries except Hong Kong are lower than value-growth spreads based on single factor valuation ratio P/E.

Comparison between Model A and Model B

We also observe that value portfolios constructed using Models A and B record lower average monthly returns (and average risk adjusted monthly returns) compared to value portfolios defined by single factor valuation ratio P/E as evidenced by following:

- Value portfolios constructed using Models A and B record lower average monthly returns for all countries with the exception of Hong Kong

This indicates that the P/E method of defining value portfolios produces superior returns compared to Models A and B.

We also determine that growth portfolios based on Models A and B have higher average monthly returns (and average risk adjusted monthly returns) than growth portfolios defined by single factor valuation ratio P/E as evidenced by following:

- Growth portfolios constructed using Model A record higher average monthly returns in each of the nine countries
- Growth portfolios constructed using Model B record higher average monthly returns in all countries with the exception of Hong Kong

We further observe that growth portfolios based on Model A (column 2) record higher average monthly returns and average monthly risk adjusted returns compared to growth portfolios based on Model B (column 3).

We confirm that although Model B explains the variability of P/E better compared to Model A (as observed by the results in Table 5.12), Model A which uses a combination of historical and forecast data is a better predictor of future returns of growth stocks both in absolute and risk adjusted basis.

Model C – historical data + historical price performance

Value portfolios selected using Model C shows improved performance when compared to value portfolios constructed using Models A and B.The results show that value portfolios based on Model C (column 4) in six out of nine countries record higher average monthly returns compared to value portfolios based on Models A and B. Results on "P/E" Composite based on Model C are similar to results on "P/B Composite" based on Model C. This reinforces our initial assumption that there is a need to capture the relationship between the intrinsic value of a stock and its price, especially for value stocks.

Model C also records the lowest Schwarz Criterion value compared to Models A and B as evidenced by the results in Table 5.10. This indicates that Model C has the best fit to P/E even after Model C is adjusted by a penalty for additional coefficients.

The results for Model C and P/E are broadly the same. Given that Model C is the most preferred in defining goodness of fit and explaining the variability of P/E, one can expect the performance of portfolios based on Model C to be similar as that by single factor valuation ratio P/E.

5.8.1.3 "P/Sales" Composite: Multi-factor Composite computed by Multiplying the Theoretical Drivers with the Coefficient Estimates obtained from Regressions using P/Sales as Dependent Variable (Table 5.13)

We observe the following results for Model A (based on a combination of historical and forecasts data), Model B (based on historical data), a comparison of results for Model A vs Model B and results of Model C (which includes all the variables in Model B in addition to historical price performance):

Model A – combination of historical and forecast data

Key results observed for value portfolios and value-growth spreads are summarised below:

- Value portfolios based on Model A in all countries with the exception of Hong Kong and Philippines record lower average monthly returns (and average risk adjusted monthly returns) than value portfolios defined by single factor valuation ratio P/Sales.

- Value-growth spreads based on Model A in each country with the exception of Hong Kong are lower than value-growth spreads based on single factor valuation ratio P/Sales.

Key results observed for Growth portfolios are summarised below:

- Growth portfolios based on Model A record higher average monthly returns (and average risk adjusted monthly returns) than growth portfolios defined by single factor valuation ratio P/Sales.

Table 5.13 – Monthly Returns for Equally Weighted Value and Growth Portfolios Sorted on on "P/Sales" Composite and Single Factor Valuation Ratio P/Sales

	P/Sales MODEL A			P/Sales MODEL B			P/Sales MODEL C			P/Sales		
	V	G	V-G	V	G	V-G	V	G	V-G	V	G	V-G
Hong Kong 6/90-6/2001												
AR	0.94	0.95	-0.01	0.90	0.96	-0.05	0.86	0.85	0.02	0.74	0.88	-0.14
	(8.70)	(9.75)	[-0.02]	(8.99)	(9.68)	[-0.16]	(9.18)	(9.79)	[0.04]	(9.21)	(9.38)	[-0.39]
RR	0.11	0.10		0.10	0.10		0.09	0.09		0.08	0.09	
Indonesia 6/93-6/2001												
AR	0.72	-0.27	0.99	0.86	-0.11	0.97	0.69	0.12	0.57	1.01	-1.08	2.12
	(14.44)	(11.90)	[1.10]	(14.27)	(11.74)	[0.98]	(12.61)	(12.44)	[0.84]	(16.33)	(11.89)	[2.04]
RR	0.05	-0.02		0.06	-0.01		0.05	0.01		0.06	-0.09	
Japan 6/90 - 6/2001												
AR	-0.46	-0.39	-0.07	-0.42	-0.45	0.03	-0.39	-0.45	0.06	-0.44	-0.45	0.01
	(7.09)	(6.75)	[-0.36]	(7.22)	(6.67)	[0.14]	(7.44)	(6.53)	[0.29]	(7.29)	(6.59)	[0.05]
RR	-0.06	-0.06		-0.06	-0.07		-0.05	-0.07		-0.06	-0.07	
Korea 6/93 - 6/2001												
AR	0.03	-0.17	0.21	0.01	0.09	-0.08	0.08	-0.15	0.24	0.11	-0.61	0.72
	(12.80)	(11.41)	[0.38]	(13.09)	(11.44)	[-0.14]	(13.49)	(11.16)	[0.35]	(13.76)	(11.17)	[0.97]
RR	0.00	-0.02		0.00	0.01		0.01	-0.01		0.01	-0.05	
Malaysia 6/93 - 6/2001												
AR	0.46	0.03	0.43	0.50	0.06	0.44	0.48	0.03	0.45	0.58	-0.22	0.80
	(15.30)	(11.21)	[0.67]	(15.26)	(11.35)	[0.66]	(15.03)	(11.46)	[0.70]	(14.45)	(12.15)	[1.45]
RR	0.03	0.00		0.03	0.01		0.03	0.00		0.04	-0.02	
Philippines 6/94 - 6/2001												
AR	-0.58	-0.03	-0.55	-0.21	-0.76	0.55	-0.59	-0.69	0.10	-0.68	-0.50	-0.18
	(13.56)	(11.58)	[-0.93]	(11.88)	(12.93)	[0.96]	(13.63)	(12.02)	[0.17]	(12.86)	(11.71)	[-0.28]
RR	-0.04	-0.00		-0.02	-0.06		-0.04	-0.06		-0.05	-0.04	
Singapore 6/90 - 6/2001												
AR	0.72	0.28	0.44	0.82	0.47	0.35	0.79	0.37	0.41	0.76	0.20	0.56
	(11.01)	(8.54)	[1.19]	(10.97)	(8.60)	[1.06]	(10.99)	(8.44)	[1.19]	(11.07)	(8.69)	[1.50]
RR	0.07	0.03		0.07	0.05		0.07	0.04		0.07	0.02	
Taiwan 6/94 - 6/2001												
AR	-0.24	-0.05	-0.19	-0.17	-0.25	0.08	-0.16	-0.17	0.00	0.05	-0.43	0.49
	(8.57)	(8.28)	[-0.52]	(8.84)	(8.49)	[0.19]	(8.91)	(8.51)	[0.01]	(8.69)	(8.26)	[1.23]
RR	-0.03	-0.01		-0.02	-0.03		-0.02	-0.02		0.01	-0.05	
Thailand 6/93 - 6/2001												
AR	0.32	-0.41	0.74	0.23	-0.42	0.65	0.15	-0.73	0.89	0.79	-0.87	1.67
	(9.91)	(12.10)	[1.10]	(8.67)	(13.48)	[0.78]	(10.02)	(12.01)	[1.17]	(9.97)	(12.04)	[2.10]
RR	0.03	-0.03		0.03	-0.03		0.02	-0.06		0.08	-0.07	

Notes for Table 5.13

Value and growth portfolios are formed on various models based on "P/Sales" Composite ratio as well as single factor valuation ratio P/Sales. Firms are weighted equally within each portfolio. We denote value (stocks in fractile 1) and growth (stocks in fractile 3) by V and G respectively and the difference between them V-G. The first row for each country is the average monthly return (AR). The second is the standard deviation of monthly returns in (parentheses) or t – statistic testing whether V-G is different from zero in [brackets]. The third row is the risk adjusted returns (RR) which is the ratio of AR to standard deviation of monthly returns.

We make use of the same set of companies for "P/Sales" Composite based on Model A, B and C as well as P/B. This allows comparison of performance across the different strategies. The number of companies are reported in Appendix 4 of Chapter 3.

Model B – historical data

Key results observed for value portfolios, growth portfolios and value-growth spreads are summarised below:

- Value portfolios based on Model B for all countries with the exception of Hong Kong, Philippines, Japan and Singapore record lower average monthly returns (and average risk adjusted monthly returns) than value portfolios defined by single factor valuation ratio P/Sales.

- Growth portfolios based on Model B in all countries with the exception of Japan and Philippines record higher average monthly returns (and average risk adjusted monthly returns) than growth portfolios defined by single factor valuation ratio P/Sales.

- Value-growth spreads based on Model B in all countries with the exception of Hong Kong, Japan and Philippines are lower than value-growth spreads based on single factor valuation ratio P/Sales.

Comparison between Model A and Model B

Firstly, we observe that value portfolios constructed using Models A and B record lower average monthly returns (and average monthly risk adjusted returns) compared to value portfolios defined by single factor valuation ratio P/Sales as evidenced by the following:

- Value portfolios constructed using Model A in each country with the exception of Hong Kong record lower average monthly returns

- Value portfolios constructed using Model B in each country with the exception of Hong Kong and Philippines (and Japan and Singapore) record lower average monthly returns

This indicates that the P/Sales method of defining value portfolios produces superior returns compared to using Models A and B.

Secondly, we observe a reversal of above observation for growth portfolios. We determine that growth portfolios have higher average monthly returns (and average risk adjusted monthly returns) than growth portfolios defined by single factor valuation ratio P/Sales as evidenced by following:

- Growth portfolios constructed using Model A in each of the nine countries record higher average monthly returns

- Growth portfolios constructed using Model B in each country with the exception of Philippines (and Japan)record higher average monthly returns

Thirdly, we observe that growth portfolios constructed using Model A in four out of nine countries record higher average monthly returns (and average risk adjusted monthly returns) compared to growth portfolios defined by Model B.

Fourthly, we confirm that although Model B explains the variability of P/Sales better compared to Model A (as observed by the results in Table 5.10), Model A which uses a combination of historical and forecast data is a better predictor of future returns of growth stocks both in absolute and risk adjusted basis.

Model C – historical data + historical price performance

Value portfolios constructed using Model C shows improved performance compared to value portfolios constructed using Models A and B.

Model C also records the lowest Schwarz Criterion value compared to Models A and B as evidenced by the results in Table 5.6. This indicates that Model C has the best fit to single factor valuation ratio P/Sales even after Model C is adjusted by a penalty for additional coefficients.

We also observe that the results for Model C and P/Sales are broadly the same. Given that Model C is the most preferred in defining goodness of fit and explaining the variability of P/Sales, one can expect the performance of portfolios based on Model C to be similar as that by single factor valuation ratio P/Sales.

5.8.1.4 "P/D" Composite: Multi-factor Composite computed by Multiplying the Theoretical Drivers with the Coefficient Estimates obtained from Regressions using P/D as Dependent Variable (Table 5.14)

We observe the following results for Model A (based on a combination of historical and forecast data), Model B (based on historical data), a comparison of results for Model A vs Model B and results of Model C (which includes all the variables in Model B in addition to historical price performance):

Model A – combination of historical and forecast data

Key results observed for value portfolios and value-growth spreads are summarised below:

- Value portfolios constructed using Model A in each country with the exception of Taiwan record lower average monthly returns (and average risk adjusted monthly returns) than value portfolios constructed using single factor valuation ratio P/D.

The Taiwan market has significant exposure to the technology sector. Moreover, most stocks in the Taiwan market do not offer cash dividends and those that do offer stock dividends instead, preferring to use cashflow for future re-investments to sustain growth. The ones that do offer cash dividends tend to be companies in the mature 'old economy' sectors. However, these companies belonging to the 'old economy' sectors are facing challenges to remain competitively viable as they face strong competition from their Chinese counterparts that have an edge over them in terms of lower labour costs and strong domestic demand. A deteriorating corporate performance may affect sustainability of the present dividend yields as companies may force to lower their dividend payouts. Thus, Model A with a focus on growth prospects and an improving trend in profitability of companies is a better predictor of performance of value stocks compared to sole use of dividend yield.

- Value-growth spreads based on Model A in each country with the exception of Japan and Taiwan are lower than value-growth spreads based on single factor valuation ratio P/D.

Chapter 5 – Fundamental Drivers of Value and Growth Stocks

Table 5.14 – Monthly Returns for Equally Weighted Value and Growth Portfolios Sorted on "P/D" Composite and Single Factor Valuation Ratio P/D

	P/D MODEL A			P/D MODEL B			P/D MODEL C			P/D		
	V	G	V-G	V	G	V-G	V	G	V-G	V	G	V-G
Hong Kong 6/90-6/2001												
AR	0.88	0.87	0.00	0.91	0.63	0.28	0.58	0.76	-0.19	1.05	0.61	0.43
	(8.12)	(11.05)	[0.01]	(8.71)	(10.06)	[0.78]	(8.51)	(10.46)	[-0.54]	(9.00)	(10.31)	[1.21]
RR	0.11	0.08		0.10	0.06		0.07	0.07		0.12	0.06	
Indonesia 6/93-6/2001												
AR	0.22	0.20	0.03	0.55	-0.03	0.57	0.72	-0.39	1.11	1.08	-0.34	1.42
	(13.64)	(11.83)	[0.03]	(14.10)	(14.04)	[0.57]	(16.25)	(12.22)	[0.88]	(15.22)	(11.14)	[1.29]
RR	0.02	0.02		0.04	-0.00		0.04	-0.03		0.07	-0.03	
Japan 6/90 - 6/2001												
AR	-0.37	-0.65	0.29	-0.41	-0.58	0.16	-0.37	-0.57	0.20	-0.31	-0.59	0.28
	(7.09)	(6.70)	[1.10]	(7.38)	(6.49)	[0.73]	(7.67)	(6.27)	[0.72]	(7.40)	(6.39)	[1.13]
RR	-0.05	-0.10		-0.06	-0.09		-0.05	-0.09		-0.04	-0.09	
Korea 6/93 - 6/2001												
AR	0.07	-0.14	0.21	0.08	-0.37	0.44	-0.17	-0.58	0.41	0.18	-0.17	0.35
	(12.14)	(11.74)	[0.40]	(12.09)	(12.24)	[0.76]	(12.76)	(11.60)	[0.58]	(12.92)	(11.83)	[0.49]
RR	0.01	-0.01		0.01	-0.03		-0.01	-0.05		0.01	-0.01	
Malaysia 6/93 - 6/2001												
AR	0.68	-0.28	0.97	0.91	-0.51	1.43	1.07	-0.42	1.49	1.21	-0.33	1.55
	(13.71)	(13.50)	[1.17]	(13.10)	(13.52)	[1.94]	(13.45)	(13.22)	[2.04]	(12.69)	(13.21)	[2.99]
RR	0.05	-0.02		0.07	-0.04		0.08	-0.03		0.10	-0.03	
Philippines 6/94 - 6/2001												
AR	-0.01	-0.54	0.53	0.35	-0.53	0.88	0.69	-0.26	0.95	0.28	-0.59	0.87
	(13.14)	(9.69)	[0.54]	(15.07)	(9.56)	[0.81]	(14.39)	(9.06)	[1.07]	(12.30)	(9.55)	[1.05]
RR	-0.00	-0.06		0.02	-0.06		0.05	-0.03		0.02	-0.06	
Singapore 6/90 - 6/2001												
AR	0.66	0.57	0.09	0.58	0.57	0.01	0.76	0.36	0.40	0.73	0.32	0.41
	(10.74)	(8.89)	[0.24]	(10.78)	(8.97)	[0.03]	(11.52)	(8.58)	[0.81]	(9.47)	(9.60)	[1.11]
RR	0.06	0.06		0.05	0.06		0.07	0.04		0.08	0.03	
Taiwan 6/94 - 6/2001												
AR	-0.11	-0.06	-0.05	-0.27	0.09	-0.36	-0.16	0.41	-0.57	-0.50	0.33	-0.83
	(7.63)	(9.90)	[-0.06]	(7.97)	(9.51)	[-0.45]	(7.95)	(9.90)	[-0.69]	(7.97)	(9.72)	[-1.02]
RR	-0.01	-0.01		-0.03	0.01		-0.02	0.04		-0.06	0.03	
Thailand 6/93 - 6/2001												
AR	0.87	-0.88	1.77	0.12	-1.05	1.18	-0.01	-1.08	1.08	0.96	-1.19	2.18
	(12.72)	(10.25)	[1.79]	(10.37)	(12.82)	[1.35]	(11.73)	(10.92)	[1.17]	(11.56)	(10.78)	[2.45]
RR	0.07	-0.09		0.01	-0.08		-0.00	-0.10		0.08	-0.11	

Notes for Table 5.14

Value and growth portfolios are formed on various models based on "P/D" Composite ratio as well as single factor valuation ratio P/D. Firms are weighted equally within each portfolio. We denote value (stocks in fractile 1) and growth (stocks in fractile 3) by V and G respectively and the difference between them V-G. The first row for each country is the average monthly return (AR). The second is the standard deviation of monthly returns in (parentheses) or t – statistic testing whether V-G is different from zero in [brackets]. The third row is the risk adjusted returns (RR) which is the ratio of AR to standard deviation of monthly returns.

We make use of the same set of companies for "P/D" Composite based on Model A, B and C as well as P/B. This allows comparison of performance across the different strategies. The number of companies are reported in Appendix 4 of Chapter 3.

Key results observed for Growth portfolios are summarised below:

- All countries with the exception of Japan and Taiwan show that the growth stocks based on Model A record higher average monthly returns (and average risk adjusted monthly returns) than those of the growth stocks defined by single factor valuation ratio P/D.

Most stocks in Japan have low dividend yields. Academic research and practical experience has shown that strong corporate performance will be reflected in dividend per share and dividend yields of companies. Hence, dividend yield can be used as a screening criteria for a relatively small subset of 'growth stocks with profit improvement' in Japan. Hence, dividend yield is a better predictor of performance of growth stocks compared to Model A.

In the case of Taiwan, the sample of companies in this study only incorporates companies that pay dividends, we are restricted to mainly the domestic companies and 'old economy stocks' of Taiwan. Most of the technology related companies would not be incorporated in our sample of companies as most technology companies in Taiwan do not offer cash dividends. Thus, low yield would be most readily available data to screen companies in these sectors that are on a growth path utilising its cashflow to support its growth phase.Therefore, dividend yield is a better predictor of performance of growth stocks compared to Model A.

Model B – historical data

Key results observed for value portfolios, growth portfolios and value-growth spreads are summarised below:

- Value portfolios based on Model B in all countries with the exception of Philippines and Taiwan record lower average monthly returns than the value portfolios defined by single variable P/D (column 5).

- Growth portfolios based on model B in six out of nine record higher average monthly returns (and average risk adjusted monthly returns) than growth portfolios defined by single valuation ratio P/D.

The three countries not present in the list of six above are Korea, Malaysia and Taiwan. The differences in average monthly returns between growth portfolios defined by Model B (column 3) and single factor valuation ratio P/D (column 5) for Korea, Malaysia and Taiwan are of sizes of -0.20%.

The results show that the use of a dividend yield to screen growth stocks in Taiwan produces better results than Models A and B. However, it should be noted that a deteriorating corporate performance may affect sustainability of the present dividend yield as companies may force to lower their dividend payouts in times of poor corporate performance.

However, a focus on sustainable growth prospects of companies such as ROE and payout ratios over and above growth rates and risk variables only that are used in composite valuation ratio "P/D" based on Models A and B may be a better predictor of performance in the long run compared to dividend yield.

- Value-growth spreads based on Model B in all countries with the exception of Korea, Philippines and Taiwan are lower than value-growth spreads based on single factor valuation ratio P/D (column 5).

Comparison between Model A and Model B

Firstly, we observe that value portfolios constructed using Models A and B record lower average monthly returns (and average monthly risk adjusted returns) compared to value portfolios defined by P/D as evidenced by following:

- Value portfolios based on Model A in all countries with the exception of Taiwan record lower average monthly returns
- Value portfolios based on Model B in all countries with the exception of Philippines and Taiwan record lower average monthly returns

This indicates that the P/D method of defining value stocks produces superior returns compared to Models A and B.

Secondly, we observe a reversal of above observation for growth portfolios. We determine that growth portfolios based on Models A and B have higher average monthly returns (and average monthly risk adjusted returns) than growth portfolios defined by P/D as evidenced by following:

- Growth portfolios constructed using Model A in seven countries out of nine record higher average monthly returns
- Growth portfolios constructed using Model B in six countries out of nine record higher average monthly returns

Thirdly, we observe that growth portfolios defined by Model A record higher average monthly returns and risk adjusted returns compared to growth portfolios defined by Model B. This is evidenced by the fact that the average monthly returns of the growth portfolios defined by Model A are higher than growth portfolios defined by Model B in five out of nine countries.

Fourthly, we confirm that although Model B explains the variability of P/D better compared to Model A (as observed by the results in Table 5.10), Model A is a better predictor of future returns of growth stocks both in absolute and risk adjusted basis.

Model C – historical data + historical price performance

Similar to the previous sections value portfolios constructed using Model C shows improved performance when compared to value portfolios constructed using Models A and B.

Model C also records the lowest Schwarz Criterion value compared to Models A and B as evidenced by the results in Table 5.10. This indicates that Model C has the best fit to P/D even after Model C is adjusted by a penalty for additional coefficients.

We also observe that the results for Model C and P/Sales are broadly the same.Given that Model C is the most preferred in defining goodness of fit and explaining the variability of P/D, one can expect the performance of portfolios based on Model C to be similar as that by single factor valuation ratio P/D.

5.8.2 Global Value and Growth Indices Used by the Investment Industry

Before we proceed to analyse whether the performances of value and growth portfolios constructed using the theoretical drivers (based on either historical data or a mix of historical and forecast data) exceeds the performances of commonly used benchmarks such as MSCI/Citigroup Indices, we describe a selection of single factor and multi-factor Value and Growth Indices commonly used by the investment industry. This gives us an understanding of the construction and variables used in defining the single factor and multi-factor benchmarks.

5.8.2.1 Single Factor Index

Morgan Stanley Capital International (MSCI) Value and Growth Indices are the most commonly used style indices for the global markets. MSCI maintains style indices for both the developed and emerging markets.

Frank Russell Global Equity Style Indices are also available but are less popular within the investment community as their equity style indices are restricted to the equity markets of Australia, Canada and Japan only. S&P/Barra Style Indices, Wilshire Associates Style Indices and Prudential Securities Equity Style Indices are available only for the US equity markets.

Thus, Morgan Stanley Capital International (MSCI) Value and Growth Indices, are by default the most commonly used style benchmarks for global markets in the investment industry.

The MSCI Value and Growth indices are constructed in the following way:
Every MSCI country Index is taken individually and MSCI ranks the constituent stocks by the most recently reported P/B. The stocks with the smallest P/B values are assigned to the Value Index until one half of the total market value of the country index has been assigned. The remaining stocks with larger P/B values that account for the other half of the market value of the MSCI country Index are then assigned to the Growth Index. Stocks with negative book values are automatically assigned to the Growth Index.
The resulting indices are capitalisation weighted. The style indices are reconstituted twice a year to reflect any changes in market capitalisation and P/B values of stocks.

As a result, the most common proxy in the investment industry for measuring value and growth stocks is based on a single variable, P/B.

The MSCI Value and Growth classification assumes every stock is assigned to one and only one of the two style indices. Every stock is assumed to be either a pure value or a pure growth stock. This means that the last stocks assigned to the Value Index have almost the same P/B as the first stocks assigned to the Growth Index. So low value stocks are indistinguishable from low growth stocks, although they are classified as pure growth and pure value stocks implying that they are significantly different.

Moreover this method of classifying stocks based on P/B assumes automatically that expensive stocks are growth stocks regardless of the true growth prospects of the issuing firm. In an efficient market, it is possible that growth stocks may be expensive as their prices inevitably reflect their growth opportunities. However, not every expensive stock is a "growth" stock.

5.8.2.2 Multi-factor Index

Recently a number of global style indices have been created using a combination of value and growth factors for the classification of the respective indices. However, the selection of a combination of fundamental variables for classifying value and growth stocks has been traditionally guided more by intuition and by their popularity among practitioners than by any explicit theoretical model.

Citigroup World Equity Style Indices make use of a combination of value and growth factors for the classification of the respective style indices. These Indices have become quite popular within the investment industry. However, Citigroup maintains style indices only for the developed markets.

The Citigroup Value and Growth Indices are constructed in the following way:
The starting universe is the Citigroup World Equity Index which consists of 23 developed market country indices. Each developed market index consists of every company domiciled within the respective country whose available equity capitalisation or float is greater than USD 100 million. The Citigroup World Equity Index is reconstituted annually. The process begins with the selection of a set of variables that defines and measures value and growth styles. The selection of the variables has been guided by intuition and by popularity among style index vendors. The set of variables defining value and growth styles are as follows:

Note: As of close May 2003 during the course of writing this thesis, MSCI implemented an enhanced methodology for the MSCI Global Value and Growth Indices adopting a multi-factor model. However, our study makes use of Index data using the P/B single-factor classification.

Set of intuitive variables defining value and growth styles

Value Variables	Growth Variables
P/E	Five year historical earnings per share (EPS) growth rate
P/B	Five year historical sales per share growth rate
P/Sales	Five year annual internal growth rate
P/Cash flow	Five year historical book value per share growth rate
Dividend Yield	Five year average annual EPS growth rate
	ROE
	ROA
	Dividend payout ratio
	Long term debt to common equity
	IBES five year EPS growth rate estimate

Multivariate cluster analysis is then used to determine the variables that are able to discriminate between value versus non-value and growth versus non-growth styles in each of the 23 countries.

Many of the variables are highly correlated and this technique accounts for the interactions among variables and measures the influence that several variables exert simultaneously upon value and growth characteristics. Variables that contribute little to discrimination between value versus non-value or growth versus non-growth are eliminated.

The lists of value and growth variables with discriminatory power in distinguishing between value versus non-value and growth versus non-growth are as follows:

Value and growth variables with Significant Discriminating Power

Value Variables	Growth Variables
P/B	Five year historical earnings per share (EPS) growth rate
P/Sales	Five year historical sales per share growth rate
P/Cash flow	Five year annual internal growth rate
Dividend Yield	ROE X (1-payout ratio)

Value and growth scores are then generated for each firm. Value and growth scores are computed by multiplying weights to the standardised value and growth variables respectively. For simplicity, equal weights are used for generating the multi-factor value and growth scores.

Stocks with both high growth and low value scores are designated as pure growth stocks. Likewise, stocks with both high value and low growth scores are designated as pure value stocks. These stocks are weighted at their full available equity capitalisation in their respective indices. Stocks with both high growth and high value scores as well as stocks with both low growth and low value scores are clearly neutral with respect to value and growth characteristics so they do not belong at their full available equity capitalisation in either index. Value and growth probability weights are used to determine the portion of the available equity capitalisation of these stocks allocated to each index. This ensures that the union of both the value and growth indices equals the starting universe of each country in the Citigroup World Equity Index. Value probability weight is inversely proportional to the geometric distance between the point that represents the mixed stock and the point that represents the pure value stock region in the cluster analysis. A stock that is closer to the pure value stock region has a larger value probability weight. Likewise, growth probability weight is inversely proportional to the geometric distance between the point that represents the mixed stock and the point that represents the pure growth stock region in the cluster analysis. A stock that is closer to the pure growth stock region has a larger growth probability weight.

The process is replicated across each of the 23 countries to produce value and growth indices for each country. The Citigroup World Equity Value and Growth Indices are formed by combining the value and growth indices of each of the 23 countries in the Citigroup World Equity Index. The Citigroup World Equity Value and Growth Indices are rebalanced at the end of every calendar quarter.

5.8.3 Benchmarking Performance of Composite Value and Growth Portfolios against Commonly Used Indices

In this section, we benchmark the performance of Composite Value and Growth portfolios constructed using theoretical drivers against the performance of MSCI and Citigroup Value and Growth Indices. We also aim to determine the combination of theoretical drivers ("P/B", "P/E", "P/Sales" or "P/D" Composites based on models A or C) that maximises the performance of value and growth stocks.This is achieved by benchmarking the value and growth composite portfolios against the following:

- Value and Growth Indices used by the investment industry (MSCI / Citigroup); and
- Value and Growth portfolios sorted on single valuation ratios such as P/B, P/E, P/Sales and P/D

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Our multi-factor composite valuation criteria based on the theoretical drivers for value and growth stocks have expanded the distinction between growth and value beyond that of the traditional industry norm of 'expensive' and 'cheap'. Our selection of variables used in the valuation criteria for value and growth stocks are underpinned by fundamental variables that are supported by a theoretical model and not based on 'intuition'.

Table 5.15, using average monthly returns for equally weighted composite value and growth portfolios summarises the performance of value and growth stocks based on the multi-factor composite valuation criteria as well as value and growth portfolios based on single factor valuation ratios (e.g. P/E, P/B etc). Table 5.16 summarises the performance of market capitalisation weighted value/growth portfolios. Both Tables 5.15 and 5.16 contain the performance of the indices which are reported on market capitalisation basis.

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Table 5.15 – Monthly Returns for Equally Weighted Composite Value Portfolios based on Model C and Composite Growth Portfolios based on Model A

	"P/B" Composite		"P/E" Composite		"P/Sales" Composite		"P/D" Composite		Citigroup Index		MSCI Index		P/B		P/E		P/Sales		P/D	
	V	G	V	G	V	G	V	G	V	G	V	G	V	G	V	G	V	G	V	G
Hong Kong 6/90-6/2001																				
AR	1.10	0.78	1.25	0.75	0.86	0.95	0.58	0.87	0.59	0.50			1.13	0.77	1.00	0.63	0.74	0.88	1.05	0.61
	(10.63)	(8.33)	(9.89)	(8.90)	(9.18)	(9.75)	(8.51)	(11.05)	(9.05)	(9.32)			(10.11)	(8.48)	(9.71)	(9.23)	(9.21)	(9.38)	(9.00)	(10.31)
RR	0.10	0.09	0.13	0.08	0.09	0.10	0.07	0.08	0.06	0.05			0.11	0.09	0.10	0.07	0.08	0.09	0.12	0.06
Indonesia 6/97-6/2001																				
AR	0.18	-0.92	0.69	-1.48	-0.31	-1.37	0.66	-1.43			-1.92	-1.07	0.44	-0.99	-0.63	-2.02	-0.26	-2.43	0.29	-1.90
	(24.61)	(13.89)	(18.06)	(18.25)	(16.72)	(15.71)	(22.24)	(15.32)			(16.92)	(17.01)	(22.72)	(14.19)	(18.50)	(15.41)	(22.08)	(15.63)	(20.44)	(14.10)
RR	0.01	-0.07	0.04	-0.08	-0.02	-0.09	0.03	-0.09			-0.11	-0.06	0.02	-0.07	-0.03	-0.13	-0.01	-0.16	0.01	-0.14
Japan 6/90 – 6/2001																				
AR	-0.36	-0.47	-0.48	-0.53	-0.39	-0.39	-0.37	-0.65	-0.66	-0.78			-0.35	-0.63	-0.30	-0.65	-0.44	-0.45	-0.31	-0.59
	(7.27)	(6.88)	(6.89)	(7.41)	(7.44)	(6.75)	(7.67)	(6.70)	(7.16)	(6.62)			(7.03)	(6.89)	(6.69)	(7.28)	(7.29)	(6.59)	(7.40)	(6.39)
RR	-0.05	-0.07	-0.07	-0.07	-0.05	-0.06	-0.05	-0.10	-0.09	-0.12			-0.05	-0.09	-0.04	-0.09	-0.06	-0.07	-0.04	-0.09
Korea 12/96 – 6/2001																				
AR	0.35	-0.29	0.77	-0.09	0.17	-0.22	0.04	-0.17			0.44	0.40	0.28	-0.63	0.39	-0.40	0.04	-0.69	0.39	-0.50
	(16.02)	(14.60)	(15.34)	(15.48)	(16.92)	(13.85)	(15.81)	(14.09)			(14.47)	(15.85)	(16.81)	(14.06)	(15.50)	(15.34)	(17.26)	(13.55)	(16.10)	(14.35)
RR	0.02	-0.02	0.05	-0.01	0.01	-0.02	0.00	-0.01			0.03	0.03	0.02	-0.05	0.03	-0.03	0.00	-0.05	0.02	-0.04
Malaysia 12/96 – 6/2001																				
AR	-0.63	-1.38	-0.69	-0.76	-0.57	-1.20	0.36	-2.39			-0.41	-2.12	-0.53	-1.59	-0.35	-1.84	-0.68	-1.81	0.26	-1.97
	(18.01)	(12.46)	(17.01)	(13.34)	(18.24)	(11.90)	(16.23)	(15.12)			(13.82)	(12.62)	(17.23)	(12.26)	(15.82)	(14.68)	(17.20)	(12.87)	(14.22)	(15.39)
RR	-0.04	-0.11	-0.04	-0.06	-0.03	-0.10	0.02	-0.16			-0.03	-0.17	-0.03	-0.13	-0.02	-0.13	-0.04	-0.14	0.02	-0.13
Philippines 12/96 – 6/2001																				
AR-	0.53	-0.90	-1.22	-1.08	-0.84	-0.58	-0.06	-1.14			-1.20	-1.65	-0.71	-1.20	-0.06	-1.86	-0.51	-1.48	-0.32	-1.25
	(19.22)	(10.43)	(17.13)	(13.02)	(16.59)	(13.78)	(17.02)	(11.23)			(9.97)	(11.71)	(17.87)	(11.45)	(17.31)	(13.29)	(15.55)	(13.65)	(14.69)	(11.02)
RR	-0.03	-0.09	-0.07	-0.08	-0.05	-0.04	-0.00	-0.10			-0.12	-0.14	-0.04	-0.11	-0.00	-0.14	-0.03	-0.11	-0.02	-0.11
Singapore 6/90 - 6/2001																				
AR	0.65	0.69	0.88	0.31	0.79	0.28	0.76	0.57	0.39	0.06			0.67	0.38	0.99	0.22	0.76	0.20	0.73	0.32
	(11.16)	(8.31)	(10.14)	(9.63)	(10.99)	(8.54)	(11.52)	(8.89)	(8.83)	(8.78)			(10.67)	(8.48)	(9.39)	(10.00)	(11.07)	(8.69)	(9.47)	(9.60)
RR	0.06	0.08	0.09	0.03	0.07	0.03	0.07	0.06	0.04	0.01			0.06	0.04	0.11	0.02	0.07	0.02	0.08	0.03
Taiwan 12/96 – 6/2001																				
AR	-1.17	0.19	-0.86	-1.12	-0.71	-0.60	-0.75	-0.39			-0.61	-0.38	-1.19	-0.66	-0.51	-1.37	-0.70	-1.10	-1.17	-0.27
	(9.66)	(10.37)	(9.78)	(9.38)	(10.10)	(9.14)	(8.70)	(10.31)			(9.30)	(10.02)	(10.38)	(10.43)	(9.55)	(10.01)	(9.71)	(9.01)	(8.94)	(9.87)
RR	-0.12	0.02	-0.09	-0.12	-0.07	-0.07	-0.09	-0.04			-0.07	-0.04	-0.12	-0.06	-0.05	-0.14	-0.07	-0.12	-0.13	-0.03
Thailand 6/97 – 6/2001																				
AR	1.68	1.00	2.73	0.92	1.34	1.08	1.54	0.45			-1.60	-1.21	3.41	-0.64	2.87	-0.81	2.40	-0.11	2.99	-0.68
	(16.07)	(12.95)	(17.82)	(9.28)	(12.31)	(13.59)	(14.88)	(9.35)			(23.50)	(14.96)	(16.05)	(11.21)	(17.38)	(10.12)	(12.46)	(13.96)	(14.44)	(11.63)
RR	0.10	0.08	0.15	0.10	0.11	0.08	0.10	0.05			-0.07	-0.08	0.21	-0.06	0.17	-0.08	0.19	-0.01	0.21	-0.06

Notes for Table 5.15

"P/B", "P/E", "P/Sales" and "P/D" Composite value and growth portfolios are formed on Models C and Model A respectively using coefficient estimates of regressions based on P/B, P/E, P/Sales and P/D as dependent variable respectively. We also provide the performance of value and growth portfolios formed on single factor valuation ratios. Firms are weighted equally within each portfolio. We denote value (stocks in fractile 1) and growth portfolios (stocks in fractile 3) by V and G respectively and the difference between them V-G. We make use of Citigroup Index for the developed markets and MSCI Index for the smaller emerging markets in Asia. The first row for each country is the average monthly return (AR). The second is the standard deviation of monthly returns in (parentheses) or t – statistic testing whether V-G is different from zero in [brackets]. The third row is the risk adjusted returns (RR) which is the ratio of AR to standard deviation of monthly returns.

Table 5.16 – Monthly Returns for Market Capitalisation Weighted Composite Value Portfolios based on Model C and Composite Growth Portfolios based on Model A

	"P/B" Composite		"P/E" Composite		"P/Sales" Composite		"P/D" Composite		Citigroup Index		MSCI Index		P/B		P/E		P/Sales		P/D	
	V	G	V	G	V	G	V	G	V	G	V	G	V	G	V	G	V	G	V	G
Hong Kong 6/90-6/2001																				
AR	1.04	1.38	1.80	1.32	1.33	1.20	1.09	1.30	0.59	0.50			0.89	1.18	0.93	1.12	1.07	1.21	1.24	1.06
	(10.90)	(8.25)	(10.24)	(9.52)	(10.12)	(9.28)	(8.29)	(9.81)	(9.05)	(9.32)			(10.93)	(8.33)	(10.19)	(9.09)	(8.64)	(9.24)	(9.21)	(9.49)
RR	0.10	0.17	0.18	0.14	0.13	0.13	0.13	0.13	0.06	0.05			0.08	0.14	0.09	0.12	0.12	0.13	0.13	0.11
Indonesia 6/97-6/2001																				
AR	-1.91	0.30	1.32	-4.04	-1.01	-0.41	1.95	-0.23			-1.92	-1.07	-0.36	-0.25	-1.02	-1.06	-3.06	-0.75	-0.15	-0.95
	(19.81)	(15.69)	(18.79)	(16.28)	(14.35)	(16.54)	(19.64)	(15.54)			(16.92)	(17.01)	(19.86)	(15.66)	(18.20)	(15.55)	(18.29)	(15.55)	(15.81)	(15.43)
RR	-0.10	0.02	0.07	-0.25	-0.07	-0.03	0.10	-0.02			-0.11	-0.06	-0.02	-0.02	-0.06	-0.07	-0.17	-0.05	-0.01	-0.06
Japan 6/90 – 6/2001																				
AR	-0.11	-0.28	0.02	-0.54	-0.22	-0.18	-0.22	-0.35	-0.66	-0.78			-0.17	-0.43	0.11	-0.45	-0.30	-0.25	-0.13	-0.24
	(6.76)	(6.55)	(6.02)	(6.38)	(6.58)	(6.42)	(6.83)	(6.97)	(7.16)	(6.62)			(6.47)	(6.48)	(5.78)	(6.92)	(6.53)	(6.34)	(5.99)	(6.22)
RR	-0.02	-0.04	0.02	-0.08	-0.03	-0.03	-0.03	-0.05	-0.09	-0.12			-0.03	-0.07	0.02	-0.06	-0.05	-0.04	-0.02	-0.04
Korea 12/96 – 6/2001																				
AR	0.43	0.56	2.42	-0.26	0.33	0.12	0.98	0.19			0.44	0.40	-0.74	0.39	0.40	0.23	-0.42	0.62	-0.22	0.57
	(15.31)	(15.10)	(16.86)	(16.05)	(15.69)	(14.27)	(18.49)	(13.49)			(14.47)	(15.85)	(15.29)	(15.65)	(15.09)	(16.07)	(16.38)	(14.18)	(15.20)	(14.75)
RR	0.03	0.04	0.14	-0.02	0.02	0.01	0.05	0.01			0.03	0.03	-0.05	0.03	0.03	0.01	-0.03	0.04	-0.01	0.04
Malaysia 12/96 – 6/2001																				
AR	-0.19	-1.78	-0.47	-0.86	-0.55	-1.24	0.69	-2.18			-0.41	-2.12	-0.06	-1.61	-0.37	-2.01	-0.86	-1.76	0.76	-1.93
	(15.89)	(9.89)	(14.79)	(10.59)	(16.14)	(9.77)	(14.68)	(12.52)			(13.82)	(12.62)	(15.49)	(10.68)	(13.34)	(12.00)	(15.18)	(10.87)	(12.29)	(13.11)
RR	-0.01	-0.18	-0.03	-0.08	-0.03	-0.13	0.05	-0.17			-0.03	-0.17	-0.00	-0.15	-0.03	-0.17	-0.06	-0.16	0.06	-0.15
Philippines 12/96 – 6/2001																				
AR	-1.28	-1.21	-1.95	-1.06	-1.26	-1.36	-0.66	-1.46			-1.20	-1.65	-1.28	-1.25	-1.14	-1.49	-1.05	-1.39	-1.02	-1.13
	(17.68)	(11.44)	(15.39)	(9.91)	(11.53)	(11.41)	(11.22)	(10.29)			(9.97)	(11.71)	(17.04)	(10.78)	(14.07)	(11.20)	(13.63)	(12.07)	(11.91)	(11.04)
RR	-0.07	-0.11	-0.13	-0.11	-0.11	-0.12	-0.06	-0.14			-0.12	-0.14	-0.08	-0.12	-0.08	-0.13	-0.08	-0.12	-0.09	-0.10
Singapore 6/90 - 6/2001																				
AR	0.03	0.18	0.45	-0.18	0.39	0.20	0.36	0.49	0.39	0.06			0.35	0.29	1.12	-0.24	0.37	0.21	0.49	-0.32
	(10.42)	(6.54)	(9.40)	(9.29)	(9.87)	(6.76)	(10.62)	(7.10)	(8.83)	(8.78)			(9.51)	(7.09)	(8.69)	(8.79)	(10.08)	(7.21)	(8.50)	(9.18)
RR	0.00	0.03	0.05	-0.02	0.04	0.03	0.03	0.07	0.04	0.01			0.04	0.04	0.13	-0.03	0.04	0.03	0.06	-0.04
Taiwan 12/96 – 6/2001																				
AR	-1.38	0.49	0.04	-0..35	-0.45	0.32	-0.48	-0.77			-0.61	-0.38	-0.39	-0.10	0.50	-1.03	-0.63	-0.12	-0.51	-0.63
	(9.15)	(11.59)	(10.17)	(8.77)	(9.63)	(10.28)	(8.30)	(10.02)			(9.30)	(10.02)	(10.48)	(10.75)	(9.81)	(9.36)	(9.43)	(10.24)	(7.72)	(9.29)
RR	-0.15	0.04	0.00	-0.04	-0.05	0.03	-0.06	-0.08			-0.07	-0.04	-0.04	-0.01	0.05	-0.11	-0.07	-0.01	-0.07	-0.07
Thailand 6/97 – 6/2001																				
AR	-0.21	-1.43	0.94	-0.36	-0.59	-0.23	0.81	-1.06			-1.60	-1.21	1.43	-1.28	0.93	-1.74	0.57	-1.10	1.17	-1.00
	(18.51)	(11.83)	(22.06)	(13.27)	(15.37)	(12.92)	(14.54)	(13.71)			(23.50)	(14.96)	(16.55)	(12.04)	(17.62)	(12.43)	(13.90)	(14.00)	(14.99)	(12.21)
RR	-0.01	-0.12	0.04	-0.03	-0.04	-0.02	0.06	-0.08			-0.07	-0.08	0.09	-0.11	0.05	-0.14	0.04	-0.08	0.08	-0.08

Notes for Table 5.16

"P/B", "P/E", "P/Sales" and "P/D" Composite value and growth portfolios are formed on Models C and Model A respectively using coefficient estimates of regressions based on P/B, P/E, P/Sales and P/D as dependent variable respectively. We also provide the performance of value and growth portfolios formed on single factor valuation ratios. Firms are weighted by their market capitalisation within each portfolio. We denote value (stocks in fractile 1) and growth portfolios (stocks in fractile 3) by V and G respectively and the difference between them V-G. We make use of Citigroup Index for the developed markets and MSCI Index for the smaller emerging markets in Asia. The first row for each country is the average monthly return (AR). The second is the standard deviation of monthly returns in (parentheses) or t – statistic testing whether V-G is different from zero in [brackets]. The third row is the risk adjusted returns (RR) which is the ratio of AR to standard deviation of monthly returns.

Chapter 5 – Fundamental Drivers of Value and Growth Stocks

We report our analysis for equally weighted composite value/growth portfolios and equally weighted single factor value/growth portfolios so as to replicate the practical implementation of equally weighted portfolios used in the industry.

5.8.3.1 Our Multi-factor Composite Valuation Criteria for Growth Stocks

Earlier results of our studies show that the strategy using the multi-factor composite valuation based on Model A (based on a mix of historical and forecast data) is a better predictor of future returns of growth stocks. Model A makes use of variables actually related to the fundamental prospects of a company (and not just its high price). It includes variables related to:

- expectations of growth based on IBES Consensus Mean FY1 earnings growth forecasts
- sustainable long term growth prospects of a company (linked with (1-payout ratio)x ROE which is identified in "P/B", and (1-payout ratio)x Net Profit Margin which is identified in"P/Sales")
- risk (Beta, Net Debt to Equity ratio)

5.8.3.1.1 Benchmarking Performance of Composite Portfolio of Growth Stocks against the Performance of MSCI Growth Index

We compare the performance of the Composite portfolio of growth stocks (compiled using the multi-factor composite valuation criteria) against the MSCI Growth Index for all countries excluding Hong Kong, Japan and Singapore. We compare our results for growth portfolios in Hong Kong, Japan and Singapore against the Multi-factor Citigroup Index in Section 5.8.3.1.2 as the Citigroup only maintains style indices for the developed markets. The results based on average monthly returns in Table 5.15 show the following:

The investment strategy of designing a growth portfolio using the multi-factor composite valuation criteria outperforms the MSCI Growth Index.

There is at least one multi-factor composite growth portfolio ("P/B", "P/E", "P/Sales", "P/D" Composite) in five out of six countries that show outperformance against the respective MSCI Growth Index.

Korea is the only exception where all Composite Growth portfolios underperform the MSCI Korea Growth Index.

The reason for this aberration is explained below:

The comparison made for Korea covers the limited period of December 1996 to June 2001 as the MSCI Korea Style Indices were implemented in December 1996. The Korea market is one of the Asian Tiger economies with bright economic prospects during the 80s and early 90s prior to the Asian crisis in 97/98. The Korean industries were then globally competitive in the electronics, cyclical automotive and petrochemical sectors until the Asian crisis and the Technology Bust years. During the Asian Tiger boom of the 80s and 90s analysts and investors tended to extrapolate past performance to expectations of future growth. The analysts' forecasts (using past performance) may have been over-optimistic during the pre-Asian crisis and over-pessimistic during the post Asian and Tech Bust Years. Therefore, our use of analysts forecasts as expectation of future growth would have been systematically over-optimistic and over-pessimistic. This would have resulted in underestimation of the true potential of growth stocks in Korea.

Another reason for the apparent aberration is that the sectors that survived the Asian crisis and outperformed subsequently are the domestic cyclical automotive and petrochemical sectors. The domestic sectors were being stimulated by domestic consumption on the back of loose monetary policy in Korea post Asian crisis. In addition, these domestic sector companies remained over-leveraged and would therefore be classified as 'high' P/B companies (growth stocks) because of low book values. These companies outperformed not because they had well-capitalised balance sheets or long term growth potential but because they happened to be selected as 'high' P/B companies which benefited from a loose monetary policy during the period.

During the period 1996-2001, the market appeared to price up stocks in the domestic sector as 'growth stocks' because investors expected past performance to continue in a similar manner for the foreseeable future. The market could have been caught by surprise if the government had been forced to reverse its loose monetary policy. This would have affected the profitability and sustainability of these highly leveraged companies that were on a life support machine powered by low interest rates.

It is likely that if the benchmarking exercise had been carried out on a longer term period in Korea, the multi-factor composite valuation criteria for growth stocks which makes use of a combination of variables related to future growth of a company and its associated risks such as the level of indebtedness of a firm, could have outperformed the MSCI Korea Growth Index which uses the sole criteria of P/B.

The above results are also similar for market capitalisation weighted portfolios indicating that our results are not biased by the effects of small-size (Table 5.16).

5.8.3.1.2 Benchmarking Performance of Composite Portfolio of Growth Stocks against the Performance of Citigroup Growth Index

The Citigroup World Equity Growth Index, a style index created using a combination of factors, uses the following variables:

- 5 year past earnings growth rate
- 5 year past sales growth rate
- ROE X (1- payout ratio)

The variables used make use of historical data which assume that past growth is an indicator of sustainable future long-term growth. This does not hold true as was observed during the Technology Boom and Bust Years. This was observed in the recent past when the market priced up stocks in the TMT sector as 'growth stocks' because investors expected past performance to continue in a similar manner for the foreseeable future.

In comparison, the multi-factor valuation criteria used to derive the composite portfolio of growth stocks appears to be more robust as it uses a combination of fundamental drivers based on expectations of future growth opportunities of a company, its sustainable long-term growth prospects without neglecting its associated risk (level of indebtedness). The multi-factor composite valuation criteria for growth stocks relies on the premise that markets are eventually efficient and corporate performance will be reflected in stock price performance.

We compare the performance of the Composite portfolio of growth stocks (compiled using the multi-factor composite valuation criteria) against the Citigroup Growth Indices for Hong Kong, Japan and Singapore.

The investment strategy of designing a growth portfolio using the multi-factor composite valuation criteria outperforms the Citigroup Growth Index. The performance of all four multi-factor composite growth portfolios ("P/B", "P/E", "P/Sales" and "P/D") in each of the three countries show outperformance against their respective Citigroup Growth Indices. For example, the Composite Growth portfolios in Hong Kong (columns 2-5) derived from using coefficient estimates of regressions based on P/B, P/E, P/Sales and P/D as a dependent variable record average monthly returns of 0.78%, 0.75%, 0.95% and 0.87% respectively compared to the Citigroup Hong Kong Growth Index (column 6) at 0.50%.

We observe similar results for market capitalisation weighted portfolios in Table 5.16 where there is at least one multi-factor composite growth portfolio ("P/B", "P/E", "P/Sales", "P/D" Composite) in each of the three countries that show outperformance against their respective MSCI Growth Indices.

5.8.3.1.3 Selection of Optimal Multi-factor Composite Growth Valuation Criteria Based on Theoretical Drivers

We observe that "P/B" and "P/Sales" Composite Growth portfolios appear to have the highest performance when compared against the Growth Indices as well as growth portfolios sorted on single factor valuation ratios such as P/B, P/E, P/Sales and P/D.

(The results are also similar for "P/B" and "P/Sales" Composite Growth portfolios based on the restricted models seen in Tables I-IV in Appendix 2. In fact, "P/B" and "P/Sales" Composite Growth portfolios based on the restricted models exceed the performance of "P/B" and "P/Sales" Composite Growth portfolios based on the unrestricted models in at least 6 out of 9 countries.)

The performances of "P/Sales" Composite Growth portfolios in four countries (Hong Kong, Japan, Philippines and Thailand) and "P/B" Composite Growth portfolios in three countries (Indonesia, Singapore and Taiwan) record the highest average monthly returns when compared against the all four composite Growth portfolios in each country as shown in Charts 5.1-5.7

Chapter 5 – Fundamental Drivers of Value and Growth Stocks

Chart 5.1

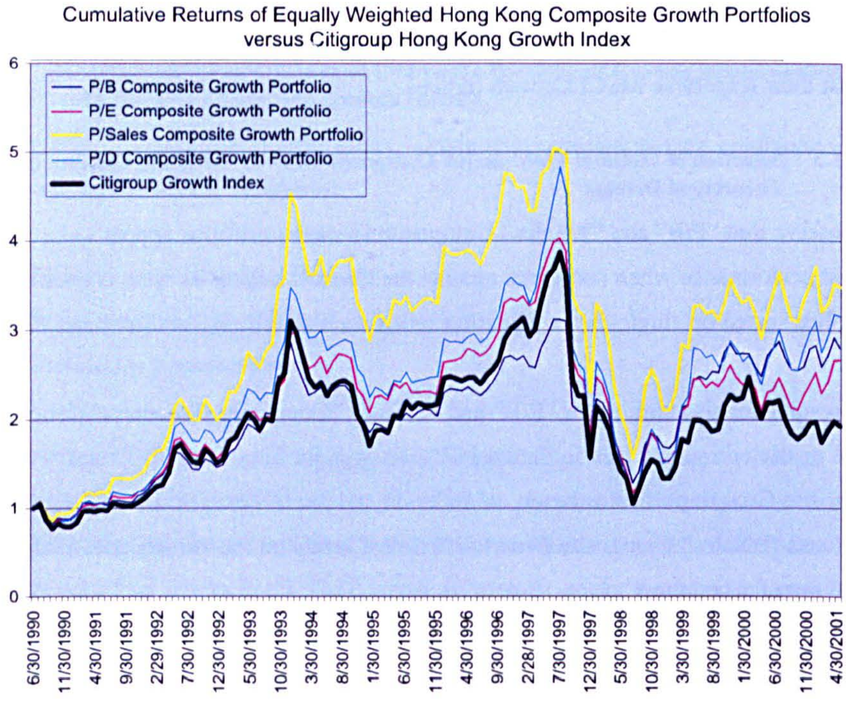

Chart 5.2

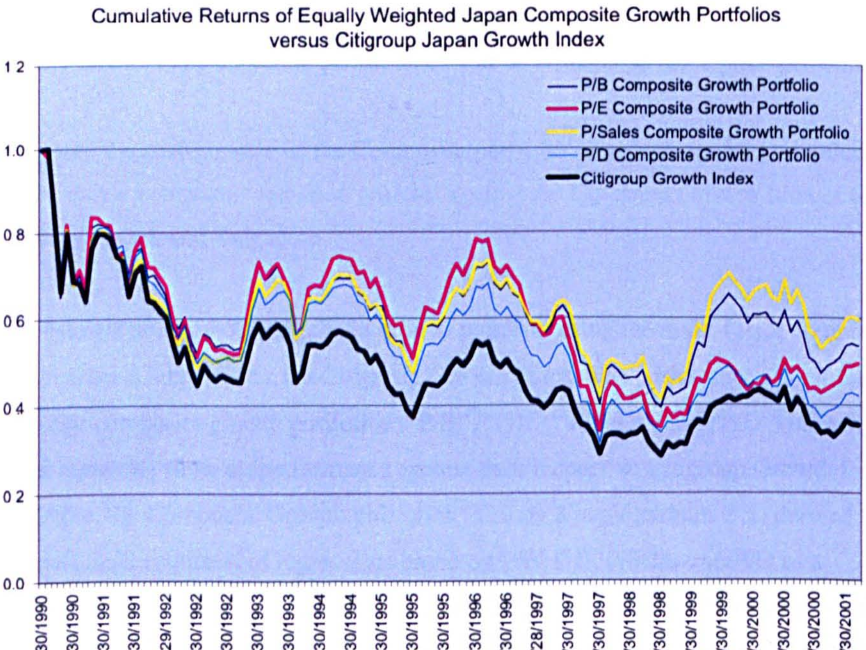

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Chart 5.3

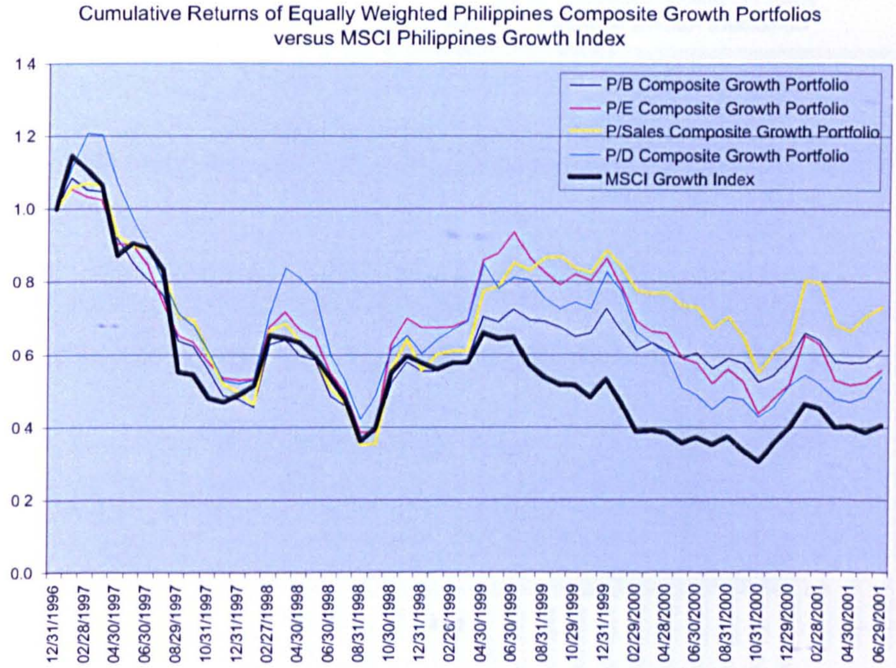

Chart 5.4

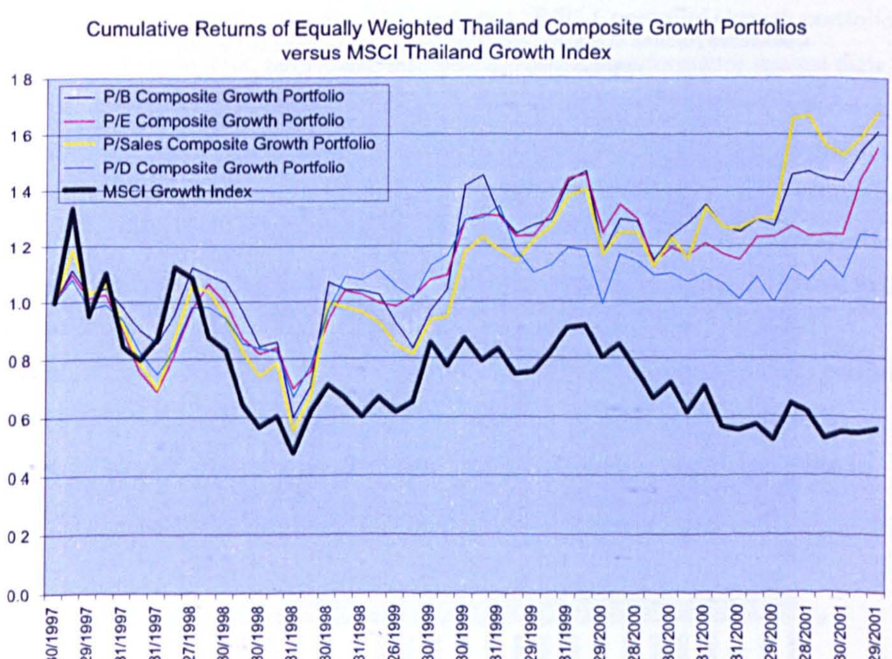

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Chart 5.5

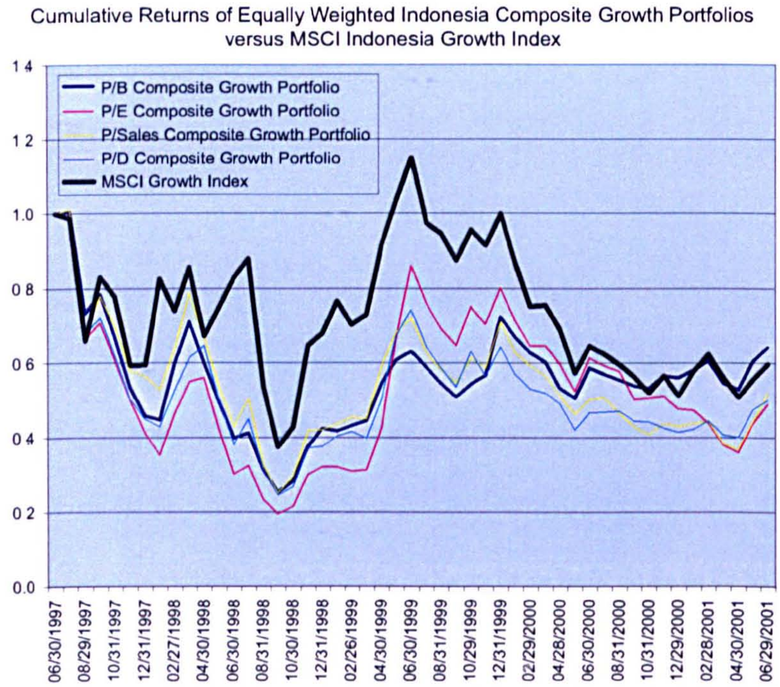
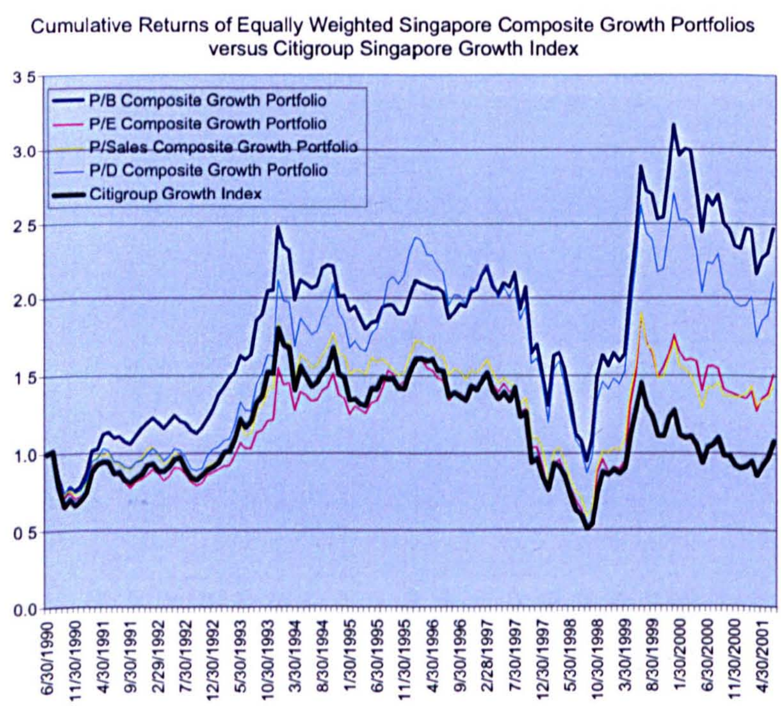
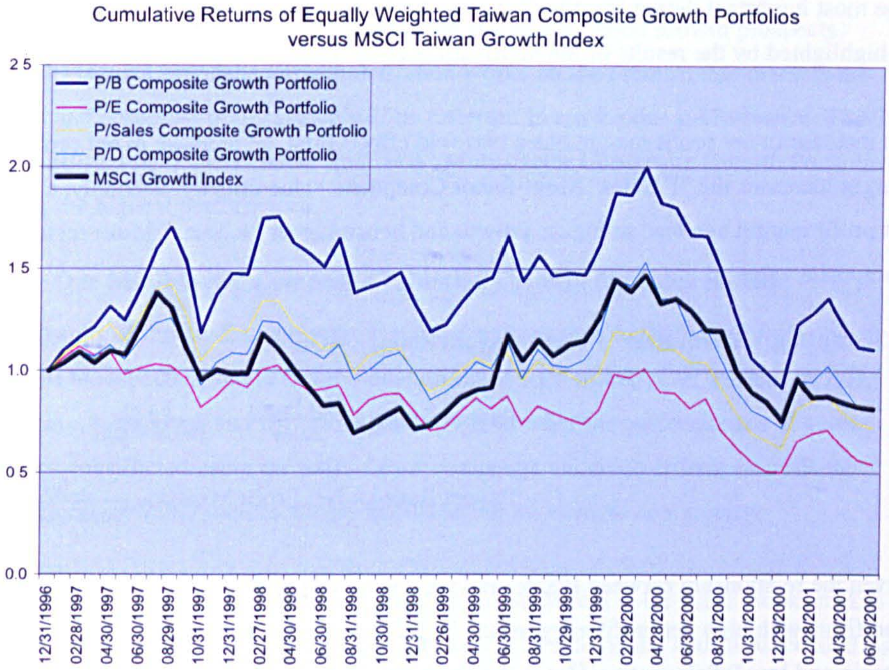


Chart 5.6



Chapter 5 – Fundamental Drivers of Value and Growth Stocks

Chart 5.7



In fact, the performances of "P/Sales" Composite Growth portfolios in four countries (Hong Kong, Japan, Philippines and Thailand) and "P/B" Composite Growth portfolios in three countries (Indonesia, Singapore and Taiwan) show outperformance against their respective country MSCI or Citigroup Growth Indices. Moreover, the performances of these "P/B" Composite Growth portfolios and "P/Sales" Composite Growth portfolios outperform their respective country Growth portfolios based on single factor valuation ratios, P/B and P/Sales respectively. For example, "P/Sales" Composite Growth portfolio in Hong Kong (column 4) records an average monthly returns of 0.95% compared to the Citigroup Hong Kong Growth Index (column 6) at 0.50%. Moreover, "P/Sales" Composite Growth portfolio in Hong Kong (column 4) outperforms the growth portfolio defined by P/Sales (column 10) that records an average monthly returns of 0.88%. We make similar observations in case of market capitalisation weighted portfolios in Table 5.16

5.8.3.1.4 "P/Sales" and "P/B" Multi-factor Composite Growth Portfolios show Maximised Performance

The most important determinant in "P/Sales" Multi-factor Composite is net profit margin as highlighted by the results of the multivariate cross-sectional regressions.

An increase in net profit margin has a two-fold effect: First, an increase in net profit margin increases the "P/Sales" Multi-factor Composite value directly. Secondly, a higher net profit margin can lead to higher growth and hence higher "P/Sales" Multi-factor Composite value.

$$\text{Sustainable Growth Rate} = (1 - \text{Payout Ratio}) \times \text{ROE}$$

$$= (1 - \text{Payout Ratio}) \times \frac{\text{Net Profit}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Book Value}}$$

$$= (1 - \text{Payout Ratio}) \times \text{Net Profit Margin} \times \frac{\text{Sales}}{\text{Book Value}}$$

Given the relationship between P/Sales ratio and net profit margin, it is not surprising to find firms with high net profit margins and high P/Sales ratios and firms with low net profit margin and low P/Sales ratios. Hence the firms that should draw investor attention are those that provide mismatches of P/Sales ratios and net profit margin: high P/Sales ratios with low net profit margins (overvalued) and low P/Sales ratios with high net profit margins (undervalued). The cross-sectional regression approach to determine "P/Sales" Multi-factor Composite value directly addresses the mismatch between P/Sales ratios and net profit margin. The "P/Sales" Multi-factor Composite is an increasing function of net profit margin in addition to expected payout ratio and expected growth rate in earnings. Similarly, the multivariate cross-sectional regressions conducted on P/B as a dependent variable highlight the importance of ROE in determining this ratio in addition to the standard variables - payout ratio, expected growth rate in earnings based on IBES forecasts and risk. The key determinant of "P/B" Multi-factor Composite is the ROE. Higher (lower) ROE leads to higher (lower) "P/B" Multi-factor Composite value. Given the relationship between P/B ratio and ROE, it is not surprising to see firms that have high ROEs selling at high P/B multiples and firms with low ROEs trading at low P/B multiples. Hence the firms that should draw investor attention are those that provide mismatches of P/B ratios and ROE: high P/B ratios with low ROEs (overvalued) and low P/B ratios with high ROEs (undervalued). The cross-sectional regression approach to determine "P/B" Multi-factor Composite directly addresses the mismatch between P/B ratios and ROE. The "P/B" Multi-factor Composite is an increasing function of ROE in addition to expected payout ratio and expected growth rate in earnings.

Both "P/Sales" and "P/B" Multi-factor Composite to define growth stocks make use of fundamental drivers directly related to corporate growth prospects. High"P/Sales" and "P/B" Multi-factor Composite values represent stocks with good growth prospects. The Multi-factor Composite Growth definition works on the premise that markets are efficient and corporate performance will be reflected in stock price performance. This is clearly justified by both "P/Sales" and "P/B" Multi-factor Composite Growth Portfolios showing the highest performance.

5.8.3.2 Our Multi-factor Composite Valuation Criteria for Value Stocks

Earlier results of our studies show show similar performance for value portfolios when compared to respective single factor valuation ratios such as P/B, P/E, P/Sales or P/D. In any case, in parts (a) and (b) below we analyse whether the performances of value portfolios constructed using the multi-factor composite valuation criteria exceeds the performances of Value Indices widely known in the investment community.

The multi-factor composite valuation criteria based on Model C for value stocks makes use of variables related to the fundamental prospects of a company and its associated risks and not solely on its Price Factor. It makes use of variables related to:

- expectations of growth based on extrapolation of past performance (past 1 year sales growth, past 1 year earnings growth)
- price trend (slope of least squares regression on past 12 months price data)
- risk (Beta, Net Debt to Equity ratio)

5.8.3.2.1 Benchmarking performance of Composite Portfolio of Value Stocks against the Performance of MSCI Value Index

The methodology of constructing the MSCI Value Index is based on a single factor valuation ratio, P/B which assumes that value stocks are cheap because of its poor past performance and is likely to persist in the foreseeable future with no further improvement in operational and financial performance.

We compare the performance of the Composite portfolio of value stocks (compiled using the multi-factor composite valuation criteria) against the MSCI Growth Index in part (a) and Citigroup Growth Index in Section 5.8.3.2.2.

The investment strategy of designing a value portfolio using the multi-factor composite valuation criteria outperforms the MSCI Value Index. There is at least one Multi-factor Composite Value portfolio ("P/B", "P/E", "P/Sales" and "P/D" Composite) in five out of six countries that show outperformance against the respective MSCI Value Index.

Taiwan is the only exception where all Composite Value portfolios underperform the MSCI Taiwan Value Index.

The comparison made for Taiwan covers the limited period of December 1996 to June 2001 as the MSCI Taiwan Style Indices were implemented in December 1996.
The Taiwan market is dominated by retail investors with very short term investment horizons. The punters tend to focus on 'rumour' driven stocks which are perceived to have an upside potential. The punters do not focus on earnings sustainability or other long term fundamentals of a company. The punters make use of easily available valuation variables such as P/B or P/E. As a result, the multi-factor composite valuation criteria for value stocks in Taiwan that focuses on corporate profitability, capital structure, risk and earnings expectation do not record higher average monthly returns compared to the MSCI Taiwan Value Index based solely on single factor valuation ratio P/B.

The above results are also similar for market capitalisation weighted portfolios indicating that our results are not biased by the effects of small-size.

5.8.3.2.2 Benchmarking Performance of Composite Portfolio of Value Stocks against the Performance of Citigroup Value Index

The Citigroup World Equity Value Index, a style index created using a combination of factors, uses the following variables:

- Price to Sales
- Price to Book value
- Price to Cash Flow
- Dividend Yield

These variables are all influenced the Price Factor.

In comparison, the multi-factor valuation criteria used to derive the composite portfolio of value stocks appears to be more robust as it looks at fundamental variables other than just the Price Factor. The multi-factor composite valuation looks at not just cheap stocks but a combination of variables such as expectations of growth based on extrapolation of past performance of earnings and sales, sustainable long-term growth rate, a company's associated risk as well as historical price performance. The combination of the use of expectations of growth based on extrapolation of past performance and 'price entry point' exploits the mis-pricing in stocks caused by expectational error.

The investment strategy of designing a value portfolio using the multi-factor composite valuation criteria outperforms the Citigroup Value Index

The performance of eleven out of twelve Multi-factor Composite Value portfolios across the three countries show outperformance against their respective Citigroup Value Indices. We observe similar results for market capitalisation weighted portfolios in Table 5.16 where nine out of twelve multi-factor composite value portfolios across the three countries show outperformance against their respective Citigroup Value Indices

5.8.3.2.3 Selection of Optimal Multi-factor Composite Valuation Criteria Based on Theoretical Drivers

The results based on average monthly returns in Table 5.15 show that "P/E" Composite Value portfolios appear to have the highest performance when compared against other Composite Value portfolios. It also exceeds the performance of Value indices used by the investment industry. (The results are also similar based on the restricted models seen in Tables I-IV in Appendix 2)

We observe that for both equally weighted portfolios and market capitalisation portfolios, the performances of these "P/E" Composite Value portfolios outperform their respective Value portfolios based on single factor valuation ratio, P/E, in three out of nine countries for equally weighted portfolios and four out of nine countries for market capitalisation weighted portfolios. Thus, we are not able to conclusively state that "P/E" Composite Value portfolios based on Model C, when compared to value portfolios sorted on single factor valuation ratios, P/B, P/E, P/Sales or P/D has better (or worse) performance.

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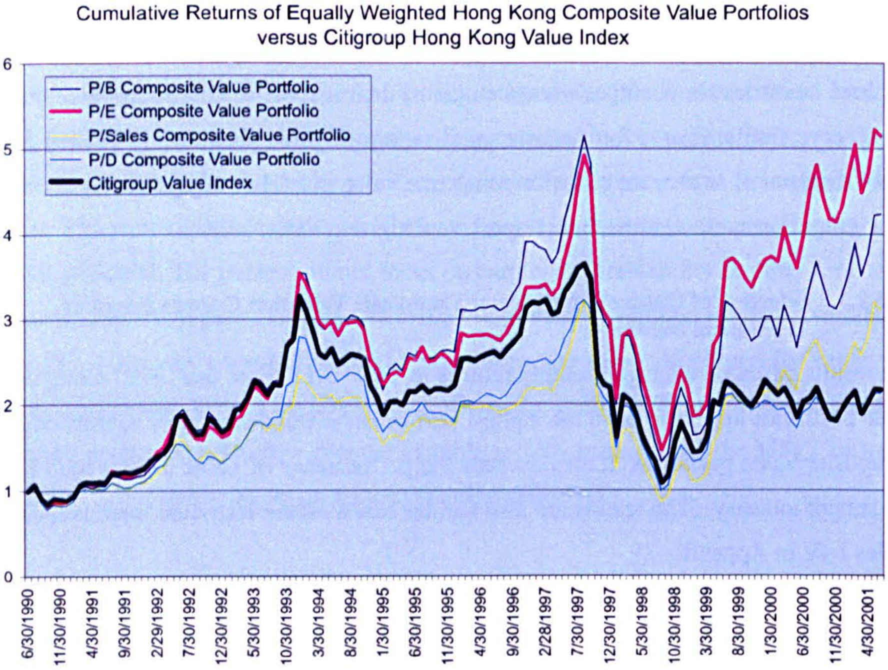
The performances of "P/E" Composite Value portfolios in five countries (Hong Kong, Indonesia, Korea, Singapore and Thailand) record the highest average monthly returns when compared to all four Composite Value portfolios in each country as shown in Charts 5.8 - 5.12.

Chart 5.8



Chapter 5 – Fundamental Drivers of Value and Growth Stocks

Chart 5.9

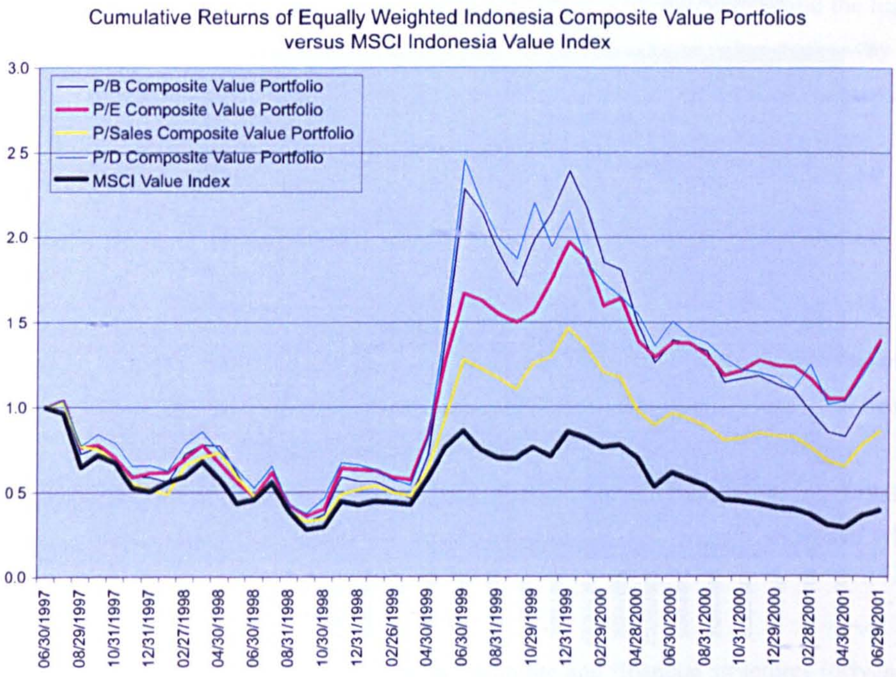
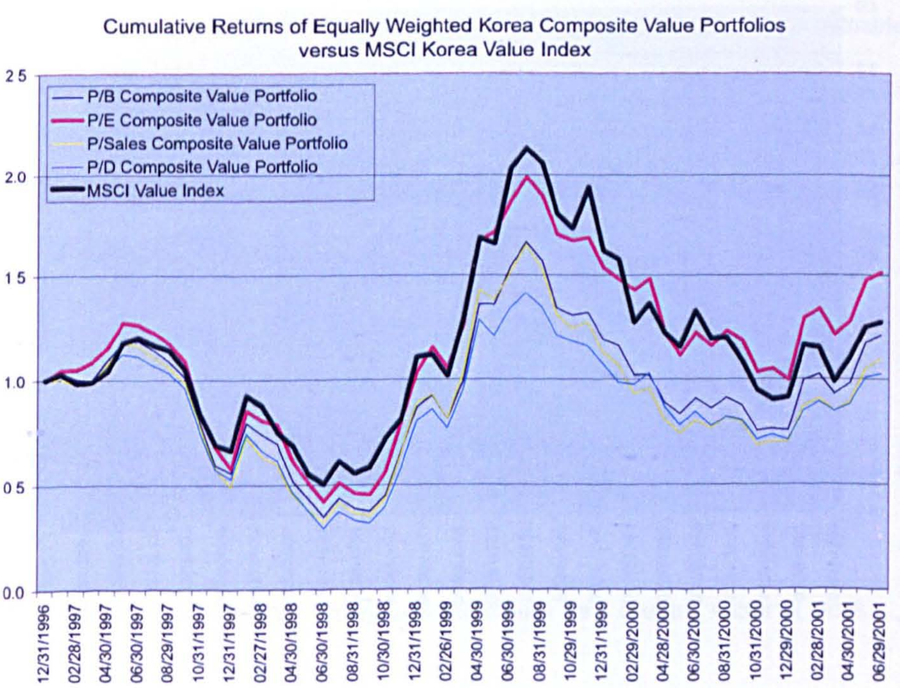


Chart 5.10



Chapter 5 – Fundamental Drivers of Value and Growth Stocks

Chart 5.11

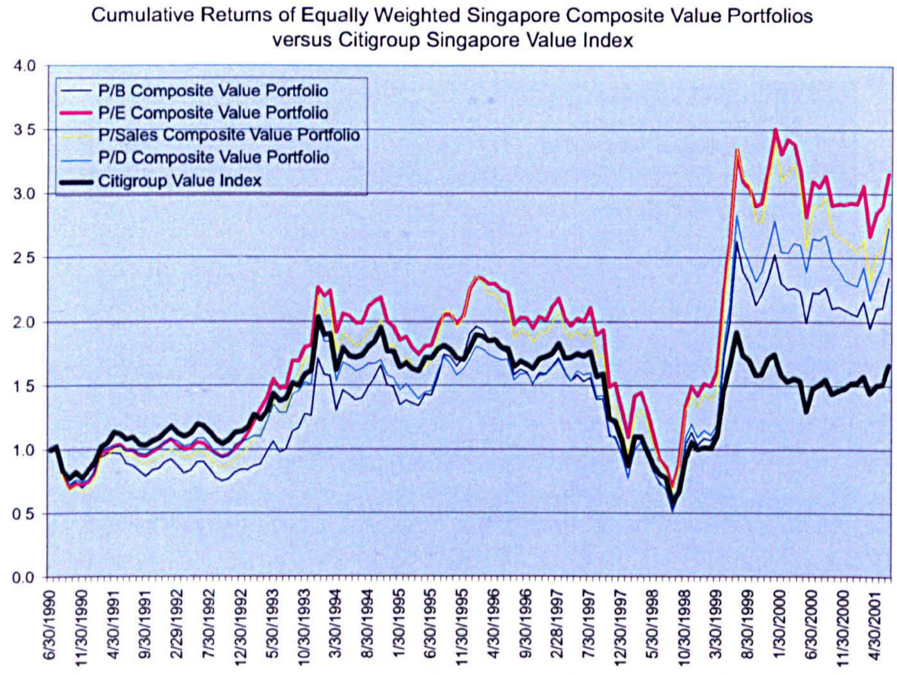
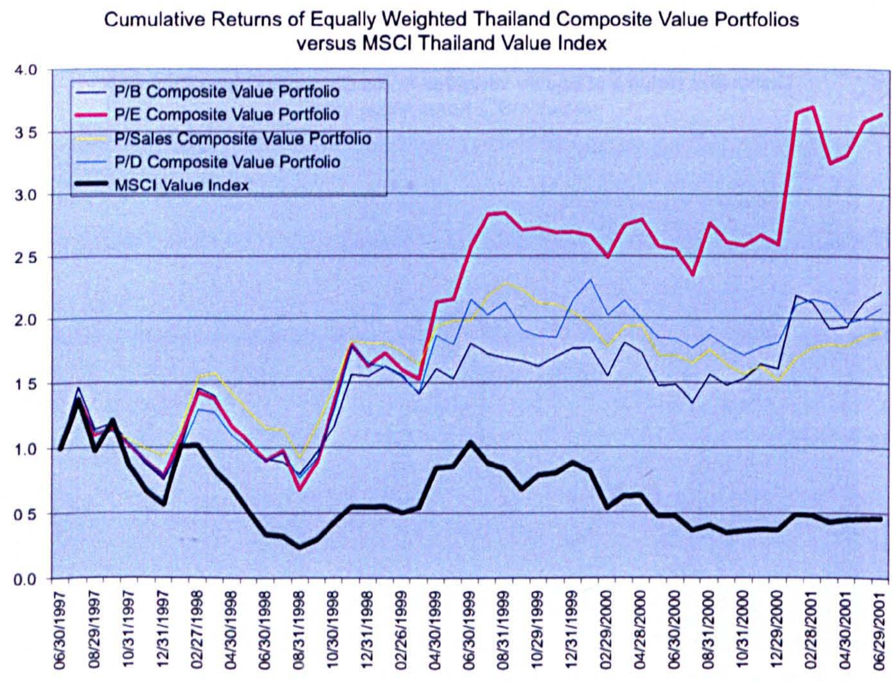


Chart 5.12



5.8.3.2.4 "P/E" Multi-factor Composite Value Portfolios show Maximised Performance

The most important determinant in "P/E" Composite is payout ratio. This implies that P/E of a firm is an increasing function of payout ratio of a firm. One can understand the logic used by academics and practitioners in classifying low P/E stocks as value stocks – by definition low P/E multiple of a firm has low payout ratio but has the capacity of providing further growth in dividend payments as the company grows in the foreseeable future. Corporate fundamentals are reflected in a firm's payout ratio and hence its dividend growth. Moreover, dividends represent the most direct measure of cashflow to a shareholder.

P/E ratio has a high predictive power as demonstrated in Table 5.15 - the performances of Value portfolios sorted by single factor valuation ratio P/E in five countries (Japan, Korea, Philippines, Singapore and Taiwan) record the highest average monthly returns when compared against value portfolios sorted on single factor valuation ratios; P/B, P/E, P/Sales and P/D in each country. The reasons highlighted below may reflect the importance of P/E as a predictor of returns:

- as Asia undergoes restructuring in its corporate and financial structures (driven in part by maturing capital markets) there is a growing shift in focus amongst corporate towards profitability

- the investor mindset is also changing with a renewed focus towards sustainable profitability

- P/E is a popular variable (widely available and easily understood by analysts and retail investors alike). EPS forecasts are widely used as a proxy for future profitability as well as risk

- reported EPS figures are updated quarterly and forecasts are easily available compared to other variables e.g. Book value, sales, cash flow etc

- makes easy comparison across stocks because it is easily available and simple to understand

- P/E reflects the market perceptions and moods for a country, sector or stock

Although, P/E ratio is the most widely used valuation ratio, it is also the most misread of all the valuation ratios used. Its simplicity makes one ignore its relationship to a firm's financial fundamentals. Investors consistently overestimate the value of growth and pay too much for high growth firms and too little for stable firms.

The "P/E" Multi-factor Composite Value addresses this systematic error by using expectations of growth based on extrapolation of past performance which exploits the mispricing in stocks caused by expectational error. The addition of price trend calculated from the slope of least squares regression on past 12 months price data helps maximise the upside potential price performance of the stock.

We are not able to conclusively state that "P/E" Composite Value portfolios based on Model C, when compared to value portfolios sorted on single factor valuation ratios P/B, P/E, P/Sales or P/D has better (or worse) performance based on average monthly returns and average monthly risk adjusted returns. However, the use of "P/E" Multi-factor Composite to define value stocks does have its merits in practical applications as it is driven by fundamental drivers.

5.8.4 Conclusion

The results in the preceding sections can be summarised as follows for Value Portfolios:

- Value portfolios selected using Model A (mix of historical and forecast data) and Model B (historical data) do not exceed the respective performance of value portfolios constructed using single factor valuation ratios such as P/B, P/E, P/Sales and P/D (inverse dividend yield)

- Value portfolios constructed using Model C (which includes all the variables in Model B in addition to 'historical price performance') shows improved performance when compared to value portfolios selected using Models A and B.

- Value portfolios selected using multi-factor composite criteria based on Model C show broadly similar performance when compared to value portfolios selected using counterpart single factor valuation ratios P/B, P/E, P/Sales and P/D respectively. We are able to conclude that given Model C is the most preferred model in defining goodness of fit and explaining the variability of P/B, P/E, P/Sales and P/D, one can expect the performance of portfolios based on Model C to be similar as that by P/B, P/E, P/Sales and P/D.

The results in the preceding sections can be summarised as follows for Growth Portfolios:

- Growth portfolios constructed using multi-factor composite Models A and B have higher average monthly returns (and average monthly risk adjusted returns) compared to growth portfolios constructed using counterpart single variables P/B, P/E, P/Sales and P/D respectively. Growth portfolios constructed by Model A record higher average monthly returns (and monthly risk adjusted returns) compared to average monthly returns of growth portfolios constructed using Model B.

Therefore a growth investment strategy using Model A is a better predictor of performance compared to a strategy using single factor valuation ratios. This is probably due to the following:

Model A uses a combination of historical and forecast data to estimate the composite factor valuation value. Model A is driven by fundamental drivers whereas single factor valuation ratios are driven by 'Price' as a dominant variable. Inherently, 'Price' is affected by market expectations which may be driven by irrational exuberance or pessimism. Therefore, the results of Model A are a better basis for formulating investment strategies for Growth stocks.

We also observe as follows across value and growth composite portfolios:

- The composite value and growth portfolios outperform both the respective MSCI and Citigroup Style Indices

- "P/S" and "P/B" Composite portfolios show the highest performance across growth portfolios while "P/E" Composite portfolio show the highest performance across value portfolios.

Fund managers can apply the results as summarised above to devise active investment strategies to optimise returns against benchmarks. In practical terms, fund managers have limited time and resources to select attractive stocks for further research. They usually rely on stock suggestions made by analysts from Investment Brokerage Houses or use simple widely available screening criteria such as P/B or P/E etc. This traditional method of screening stocks does not give the Fund Manager any competitive advantage over his or her peer group.

Note: The above results are similar based on the restricted models.

On the other hand, based on the above results, a Fund Manager could develop an automated screening tool based on fundamental drivers defined in "P/B", "P/S" or "P/E" composites to screen attractive ideas. This would provide the Fund Manager a competitive advantage over peers in selecting stocks for further fundamental research.

Note: It is worth noting that "P/S" and "P/B" Composite Growth portfolios based on the restricted models exceed the performance of "P/S" and "P/B" Composite Growth portfolios based on unrestricted models in at least 6 out of 9 countries. In the case of "P/E" Composite Value portfolios, the performances are broadly similar across countries for both restricted and unrestricted models.

Chapter 5 – Fundamental Drivers of Value and Growth Stocks

APPENDIX 1 – Table I – Monthly Returns for Market Capitalisation Weighted Value and Growth Portfolios Sorted on P/B Measures

	P/B MODEL A			P/B MODEL B			P/B MODEL C			P/B		
	V	G	V-G	V	G	V-G	V	G	V-G	V	G	V-G
Hong Kong 6/90-6/2001												
AR	1.04	1.38	-0.33	1.10	1.19	-0.09	1.04	1.20	-0.16	0.89	1.18	-0.30
	(11.33)	(8.25)	[-0.58]	(11.11)	(8.31)	[-0.16]	(10.90)	(8.39)	[-0.28]	(10.93)	(8.33)	[-0.50]
RR	0.09	0.17		0.099	0.14		0.10	0.14		0.08	0.14	
Indonesia 6/93-6/2001												
AR	0.35	0.83	-0.48	-0.64	0.09	-0.73	0.03	0.10	-0.06	0.53	0.47	0.07
	(14.75)	(11.86)	[-0.39]	(13.50)	(11.90)	[-0.71]	(15.39)	(11.69)	[-0.05]	(15.13)	(11.90)	[0.06]
RR	0.02	0.07		-0.05	0.008		0.00	0.01		0.04	0.04	
Japan 6/90 – 6/2001												
AR	-0.23	-0.28	0.05	-0.29	-0.30	0.01	-0.11	-0.32	0.21	-0.17	-0.43	0.26
	(6.08)	(6.55)	[0.17]	(6.20)	(6.49)	(0.033)	(6.76)	(6.40)	[0.50]	(6.47)	(6.48)	[0.62]
RR	-0.04	-0.04		-0.046	-0.046		-0.02	-0.05		-0.03	-0.07	
Korea 6/93 – 6/2001												
AR	-0.54	0.28	-0.82	0.03	0.14	-0.11	0.30	-0.18	0.48	-0.48	0.42	-0.90
	(11.01)	(12.22)	[-1.18]	(11.55)	(11.93)	[-0.14]	(12.47)	(11.60)	[0.51]	(12.68)	(12.57)	[-0.86]
RR	-0.05	0.02		0.002	0.011		0.02	-0.02		-0.04	0.03	
Malaysia 6/93 – 6/2001												
AR	0.36	-0.34	0.70	0.40	-0.25	0.65	0.63	-0.14	0.77	1.01	-0.23	1.23
	(13.32)	(9.06)	[1.04]	(13.42)	(9.003)	[0.94]	(13.37)	(9.28)	[1.10]	(13.27)	(9.51)	[1.73]
RR	0.03	-0.04		0.0299	-0.027		0.05	-0.02		0.08	-0.02	
Philippines 6/94 – 6/2001												
AR	-0.22	-0.64	0.42	-0.55	-0.44	-0.11	-0.69	-0.34	-0.35	-0.59	-0.37	-0.22
	(10.84)	(10.05)	[0.49]	(9.66)	(9.72)	[-0.132]	(14.86)	(9.69)	[-0.40]	(14.26)	(9.52)	[-0.22]
RR	-0.02	-0.06		-0.06	-0.05		-0.05	-0.04		-0.04	-0.04	
Singapore 6/90 - 6/2001												
AR	0.08	0.18	-0.10	0.06	0.35	-0.29	0.03	0.34	-0.30	0.35	0.29	0.06
	(10.91)	(6.54)	[-0.15]	(10.37)	(6.87	[-0.45]	(10.42)	(6.98)	[-0.51]	(9.51)	(7.09)	[0.10]
RR	0.01	0.03		0.006	0.05		0.00	0.05		0.04	0.04	
Taiwan 6/94 - 6/2001												
AR	-0.64	0.91	-1.54	-0.35	0.48	-0.83	-0.39	0.64	-1.02	0.16	0.30	-0.14
	(8.37)	(10.21)	[-1.73]	(9.29)	(9.38)	[-1.08]	(8.89)	(11.13)	[-1.11]	(9.76)	(9.87)	[-0.17]
RR	-0.08	0.09		-0.037	0.051		-0.04	0.06		0.02	0.03	
Thailand 6/93 - 6/2001												
AR	-0.45	-1.69	1.24	-1.25	-1.61	0.36	-0.56	-1.56	1.01	-0.21	-1.53	1.33
	(10.87)	(10.21)	[1.43]	(10.90)	(12.47)	[0.46]	(14.75)	(11.00)	[0.97]	(13.39)	(10.89)	[1.39]
RR	-0.04	-0.17		-0.11	-0.13		-0.04	-0.14		-0.02	-0.14	

Notes for Table I

Value and growth portfolios are formed on various models based on "P/B" Composite ratio as well as single factor valuation ratio P/B. Firms are weighted by their market capitalisation within each portfolio. We denote value (stocks in fractile 1) and growth (stocks in fractile 3) portfolios by V and G respectively and the difference between them V-G. The first row for each country is the average monthly return (AR). The second is the standard deviation of monthly returns in (parentheses) or t – statistic testing whether V-G is different from zero in [brackets]. The third row is the risk adjusted returns (RR) which is the ratio of AR to standard deviation of monthly returns.

Model C based on P/B in Taiwan uses data period from 6/1995-6/2001. There was inadequate observation in Year 1994 to run SUR regression using the unrestricted option.

Chapter 5 – Fundamental Drivers of Value and Growth Stocks

APPENDIX 1 – Table II – Monthly Returns for Market Capitalisation Weighted Value and Growth Portfolios Sorted on P/E Measures

	P/E MODEL A			P/E MODEL B			P/E MODEL C			P/E		
	V	G	V-G	V	G	V-G	V	G	V-G	V	G	V-G
Hong Kong 6/90-6/2001												
AR	1.40	1.32	0.08	1.71	0.99	0.71	1.80	0.84	0.95	0.93	1.12	-0.20
	(10.03)	(9.52)	[0.17]	(10.07)	(9.34)	[1.45]	(10.24)	(9.41)	[1.86]	(10.19)	(9.09)	[-0.41]
RR	0.14	0.14		0.17	0.11		0.18	0.09		0.09	0.12	
Indonesia 6/93-6/2001												
AR	0.20	-1.61	1.84	1.21	-0.22	1.43	1.53	-1.26	2.83	0.31	0.14	0.16
	(12.75)	(12.49)	[1.98]	(12.78)	(12.70)	[1.52]	(14.08)	(12.67)	[2.32]	(13.92)	(12.04)	[0.16]
RR	0.02	-0.13		0.09	-0.02		0.11	-0.10		0.02	0.01	
Japan 6/90 - 6/2001												
AR	-0.02	-0.54	0.52	0.09	-0.47	0.56	0.02	-0.55	0.57	0.11	-0.45	0.56
	(6.03)	(6.38)	[1.56]	(6.12)	(6.43)	[1.72]	(6.02)	(6.49)	[1.77]	(5.78)	(6.92)	[1.49]
RR	-0.00	-0.08		0.01	-0.07		0.02	-0.55		0.02	-0.06	
Korea 6/93 - 6/2001												
AR	0.97	-0.22	1.20	0.75	-0.66	1.41	0.69	-0.48	1.17	-0.00	-0.09	0.09
	(12.61)	(12.93)	[0.61]	(12.74)	(11.53)	[1.49]	(13.67)	(13.14)	[1.09]	(12.51)	(12.92)	[0.09]
RR	0.08	-0.02		0.06	-0.06		0.05	-0.04		0.00	-0.01	
Malaysia 6/93 - 6/2001												
AR	-0.30	0.31	-0.61	0.07	0.22	-0.15	0.27	0.25	0.01	0.63	-0.50	1.13
	(11.45)	(9.88)	[-1.21]	(11.43)	(9.70)	[-0.28]	(12.13)	(9.90)	[0.02]	(11.48)	(10.71)	[2.43]
RR	-0.03	0.03		0.01	0.02		0.02	0.03		0.05	-0.05	
Philippines 6/94 - 6/2001												
AR	-0.24	-0.57	0.33	-1.08	-0.39	-0.69	-0.97	-0.35	-0.63	-0.46	-0.66	0.20
	(8.86)	(9.02)	[0.55]	(11.79)	(9.53)	[-0.81]	(12.67)	(9.17)	[-0.64]	(12.03)	(9.77)	[0.21]
RR	-0.03	-0.06		-0.09	-0.04		-0.08	-0.04		-0.04	-0.07	
Singapore 6/90 - 6/2001												
AR	0.38	-0.18	0.55	0.39	-0.07	0.46	0.45	-0.23	0.69	1.12	-0.24	1.37
	(9.26)	(9.29)	[1.37]	(9.04)	(9.19)	[1.29]	(9.40)	(7.90)	[1.26]	(8.69)	(8.79)	[2.19]
RR	0.04	-0.02		0.04	-0.01		0.05	-0.03		0.13	-0.03	
Taiwan 6/94 - 6/2001												
AR	-0.24	0.30	-0.53	0.38	0.07	0.31	0.32	0.25	0.07	0.66	-0.30	0.96
	(9.04)	(8.69)	[-0.74]	(9.27)	(9.17)	[0.41]	(9.11)	(10.23)	[0.09]	(8.64)	(9.31)	[1.26]
RR	-0.03	0.03		0.04	0.01		0.03	0.02		0.08	-0.03	
Thailand 6/93 - 6/2001												
AR	0.02	-0.89	0.91	-0.88	-0.84	-0.04	-0.33	-1.42	1.11	-0.27	-1.74	1.50
	(15.27)	(11.60)	[0.83]	(12.02)	(12.67)	[-0.04]	(16.95)	(10.31)	[0.90]	(13.55)	(10.68)	[1.37]
RR	0.00	-0.08		-0.07	-0.07		-0.02	-0.14		-0.02	-0.16	

Notes for Table II

Value and growth portfolios are formed on various models based on "P/E" Composite ratio as well as single factor valuation ratio P/E. Firms are weighted by their market capitalisation within each portfolio. We denote value (stocks in fractile 1) and growth (stocks in fractile 3) portfolios by V and G respectively and the difference between them V-G. The first row for each country is the average monthly return (AR). The second is the standard deviation of monthly returns in (parentheses) or t – statistic testing whether V-G is different from zero in [brackets]. The third row is the risk adjusted returns (RR) which is the ratio of AR to standard deviation of monthly returns.

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APPENDIX 1 – Table III – Monthly Returns for Market Capitalisation Weighted Value and Growth Portfolios Sorted on P/Sales Measures

	P/Sales MODEL A			P/Sales MODEL B			P/Sales MODEL C			P/Sales		
	V	G	V-G	V	G	V-G	V	G	V-G	V	G	V-G
Hong Kong 6/90-6/2001												
AR	0.97	1.20	-0.23	1.29	1.22	0.07	1.33	1.13	0.20	1.07	1.21	-0.13
	(8.82)	(9.28)	[-0.58]	(10.22)	(9.12)	[0.13]	(10.12)	(9.15)	[0.37]	(8.64)	(9.24)	[-0.31]
RR	0.11	0.13		0.13	0.13		0.13	0.12		0.12	0.13	
Indonesia 6/93-6/2001												
AR	1.08	-0.19	1.28	0.22	-0.09	0.30	0.58	-0.03	0.61	0.18	-0.08	0.27
	(12.99)	(12.44)	[1.34]	(11.63)	(12.62)	[0.30]	(11.66)	(13.02)	[0.69]	(15.50)	(11.89)	[0.22]
RR	0.08	-0.02		0.02	-0.01		0.05	-0.00		0.01	-0.01	
Japan 6/90 - 6/2001												
AR	-0.34	-0.18	-0.17	-0.33	-0.16	-0.17	-0.22	-0.11	-0.11	-0.30	-0.25	-0.05
	(6.42)	(6.42)	(-0.47]	(6.43)	(6.32)	[-0.51]	(6.58)	(6.29)	[-0.28]	(6.53)	(6.34)	[-0.13]
RR	-0.05	-0.03		-0.05	-0.02		-0.03	-0.02		-0.05	-0.04	
Korea 6/93 - 6/2001												
AR	-0.38	0.08	-0.45	-0.08	0.40	-0.48	0.00	0.32	-0.31	-0.27	0.24	-0.51
	(11.43)	(12.02)	[-0.63]	(12.34)	(11.69)	[-0.52]	(12.90)	(11.53)	[-0.34]	(13.25)	(11.58)	[-0.53]
RR	-0.03	0.01		-0.01	0.03		0.00	0.03		-0.02	0.02	
Malaysia 6/93 - 6/2001												
AR	0.38	-0.24	0.62	0.21	-0.15	0.36	0.40	-0.20	0.60	0.31	-0.51	0.82
	(12.68)	(8.75)	[0.94]	(12.83)	(8.63)	[0.53]	(13.43)	(8.84)	[0.81]	(12.60)	(9.68)	[1.23]
RR	0.03	-0.03		0.02	-0.02		0.03	-0.02		0.02	-0.05	
Philippines 6/94 - 6/2001												
AR	-0.44	-0.57	0.14	-0.37	-0.73	0.36	-0.44	-0.79	0.36	-0.76	-0.38	-0.39
	(9.89)	(10.15)	[0.17]	(9.40)	(11.27)	[0.41]	(9.88)	(10.34)	[0.51]	(11.70)	(10.68)	[-0.54]
RR	-0.04	-0.06		-0.04	-0.06		-0.04	-0.08		-0.07	-0.04	
Singapore 6/90 - 6/2001												
AR	0.34	0.20	0.13	0.59	0.30	0.29	0.39	0.32	0.07	0.37	0.21	0.16
	(10.44)	(6.76)	[0.21]	(10.45)	(6.75)	[0.48]	(9.87)	(6.85)	[0.13]	(10.08)	(7.21)	[0.29]
RR	0.03	0.03		0.06	0.05		0.04	0.05		0.04	0.03	
Taiwan 6/94 - 6/2001												
AR	0.06	0.62	-0.56	0.11	0.43	-0.32	0.14	0.43	-0.29	0.15	0.15	-0.00
	(8.72)	(9.12)	[-1.00]	(8.76)	(9.56)	[-0.52]	(8.60)	(9.67)	[-0.46]	(8.51)	(9.57)	[-0.00]
RR	0.01	0.07		0.01	0.05		0.02	0.04		0.02	0.02	
Thailand 6/93 - 6/2001												
AR	-0.86	-0.63	-0.24	-0.63	-1.28	0.67	-0.84	-1.41	0.58	-0.24	-1.41	1.19
	(11.75)	(11.46)	[-0.25]	(10.41)	(11.93)	[0.75]	(12.89)	(11.65)	[0.74]	(11.23)	(12.25)	[1.30]
RR	-0.07	-0.05		-0.06	-0.11		-0.06	-0.12		-0.02	-0.12	

Notes for Table III

Value and growth portfolios are formed on various models based on "P/Sales" Composite ratio as well as single factor valuation ratio P/Sales. Firms are weighted by their market capitalisation within each portfolio. We denote value (stocks in fractile 1) and growth (stocks in fractile 3) portfolios by V and G respectively and the difference between them V-G. The first row for each country is the average monthly return (AR). The second is the standard deviation of monthly returns in (parentheses) or t – statistic testing whether V-G is different from zero in [brackets]. The third row is the risk adjusted returns (RR) which is the ratio of AR to standard deviation of monthly returns.

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APPENDIX 1 – Table IV – Monthly Returns for Market Capitalisation Weighted Value and Growth Portfolios Sorted on P/D Measures

	P/D MODEL A			P/D MODEL B			P/D MODEL C			P/D		
	V	G	V-G	V	G	V-G	V	G	V-G	V	G	V-G
Hong Kong 6/90-6/2001												
AR	1.32	1.30	0.02	1.38	0.92	0.45	1.09	1.00	0.09	1.24	1.06	0.18
	(7.78)	(9.81)	[0.04]	(8.64)	(9.55)	[0.80]	(8.29)	(9.58)	[0.17]	(9.21)	(9.49)	[0.49]
RR	0.17	0.13		0.16	0.10		0.13	0.10		0.13	0.11	
Indonesia 6/93-6/2001												
AR	0.08	0.71	-0.63	0.15	0.64	-0.49	1.05	0.41	0.63	0.49	0.16	0.33
	(10.76)	(12.37)	[-0.57]	(11.08)	(12.87)	[-0.44]	(14.70)	(13.00)	[0.50]	(12.50)	(12.06)	[0.31]
RR	0.01	0.06		0.01	0.05		0.07	0.03		0.04	0.01	
Japan 6/90 - 6/2001												
AR	-0.23	-0.35	0.12	-0.31	-0.28	-0.03	-0.22	-0.38	0.16	-0.13	-0.24	0.11
	(6.30)	(6.97)	[0.25]	(6.54)	(6.51)	[-0.07]	(6.83)	(6.09)	[0.35]	(5.99)	(6.22)	[0.28]
RR	-0.04	-0.05		-0.05	-0.04		-0.03	-0.06		-0.02	-0.04	
Korea 6/93 - 6/2001												
AR	0.47	0.05	0.43	0.60	0.28	0.33	0.47	-0.30	0.77	-0.31	0.55	-0.86
	(12.97)	(11.76)	[0.48]	(13.29)	(11.81)	[0.37]	(14.61)	(11.40)	[0.71]	(12.09)	(12.30)	[-0.74]
RR	0.04	0.00		0.05	0.02		0.03	-0.03		-0.03	0.04	
Malaysia 6/93 - 6/2001												
AR	0.37	-0.43	0.80	0.68	-0.49	1.18	0.56	-0.41	0.97	1.31	-0.33	1.65
	(11.81)	(11.57)	[0.94]	(10.86)	(11.85)	[1.46]	(12.16)	(12.17)	[1.02]	(10.83)	(11.18)	[2.47]
RR	0.03	-0.04		0.06	-0.04		0.05	-0.03		0.12	-0.03	
Philippines 6/94 - 6/2001												
AR	-0.40	-0.43	0.03	-0.67	-0.41	-0.26	0.01	-0.60	0.62	-0.48	-0.35	-0.13
	(8.66)	(9.15)	[0.04]	(10.40)	(9.43)	[-0.38]	(9.76)	(8.60)	[0.75]	(10.38)	(9.60)	[-0.17]
RR	-0.05	-0.05		-0.06	-0.04		0.00	-0.07		-0.05	-0.04	
Singapore 6/90 - 6/2001												
AR	0.17	0.49	-0.32	0.29	0.33	-0.04	0.36	-0.05	0.42	0.49	-0.32	0.82
	(10.32)	(7.10)	[-0.50]	(10.21)	(8.01)	[-0.06]	(10.62)	(8.24)	[0.67]	(8.50)	(9.18)	[1.41]
RR	0.02	0.07		0.03	0.04		0.03	-0.01		0.06	-0.04	
Taiwan 6/94 - 6/2001												
AR	0.23	-0.14	0.37	-0.10	-0.04	-0.06	0.00	0.27	-0.27	-0.06	0.12	-0.18
	(7.92)	(10.09)	[0.46]	(7.92)	(9.45)	[-0.08]	(7.67)	(10.45)	[-0.3]	(7.30)	(9.83)	[-0.20]
RR	0.03	-0.01		-0.01	-0.00		0.00	0.03		-0.01	0.01	
Thailand 6/93 - 6/2001												
AR	-0.97	-1.13	0.16	-1.14	-1.67	0.54	-0.78	-0.98	0.21	-0.03	-0.95	0.92
	(10.84)	(11.77)	[0.16]	(9.38)	(12.18)	[0.61]	(11.76)	(11.13)	[0.22]	(11.93)	(10.93)	[0.77]
RR	-0.09	-0.10		-0.12	-0.14		-0.07	-0.09		-0.00	-0.09	

Notes for Table IV

Value and growth portfolios are formed on various models based on "P/D" Composite ratio as well as single factor valuation ratio P/D. Firms are weighted by their market capitalisation within each portfolio. We denote value (stocks in fractile 1) and growth (stocks in fractile 3) portfolios by V and G respectively and the difference between them V-G. The first row for each country is the average monthly return (AR). The second is the standard deviation of monthly returns in (parentheses) or t – statistic testing whether V-G is different from zero in [brackets]. The third row is the risk adjusted returns (RR) which is the ratio of AR to standard deviation of monthly returns.

APPENDIX 2 – Table I – Monthly Returns for Equally Weighted Value and Growth Portfolios Sorted on P/B measures (based on Restricted Models)

	P/B MODEL A			P/B MODEL B			P/B MODEL C			P/B		
	V	G	V-G	V	G	V-G	V	G	V-G	V	G	V-G
Hong Kong 6/90-6/2001												
AR	0.80	0.84	-0.04	0.99	0.79	0.19	1.09	0.89	0.20	1.13	0.77	0.36
	(10.70)	(8.12)	[-0.10]	(10.49)	(8.19)	[0.50]	(10.46)	(8.62)	[0.46]	(10.11)	(8.48)	[0.87]
RR	0.07	0.10		0.09	0.10		0.10	0.10		0.11	0.09	
Indonesia 6/93-6/2001												
AR	0.01	0.57	-0.55	0.37	0.23	0.14	1.12	0.08	1.04	1.15	-0.12	1.27
	(15.46)	(10.43)	[-0.68]	(16.32)	(9.87)	[0.13]	(18.07)	(10.79)	[0.77]	(16.68)	(10.68)	[1.05]
RR	0.00	0.05		0.02	0.02		0.06	0.01		0.07	-0.01	
Japan 6/90 – 6/2001												
AR	-0.50	-0.43	-0.08	-0.51	-0.41	-0.10	-0.46	-0.51	0.04	-0.35	-0.63	0.28
	(7.09)	(6.91)	[-0.49]	(7.07)	(6.95)	[-0.62]	(7.41)	(6.64)	[0.19]	(7.03)	(6.89)	[1.40]
RR	-0.07	-0.06		-0.07	-0.06		-0.06	-0.08		-0.05	-0.09	
Korea 6/93 – 6/2001												
AR	0.01	-0.08	0.09	0.16	-0.14	0.31	0.65	-0.43	1.08	-0.11	-0.49	0.38
	(12.62)	(11.49)	[0.19]	(12.45)	(11.54)	[0.61]	(13.28)	(11.58)	[1.69]	(13.42)	(11.43)	[0.50]
RR	0.00	-0.01		0.01	-0.01		0.05	-0.04		-0.01	-0.04	
Malaysia 6/93 – 6/2001												
AR	0.21	0.12	0.09	0.32	-0.10	0.41	0.64	-0.21	0.85	0.81	-0.28	1.10
	(15.72)	(10.99)	[0.15]	(15.31)	(11.20)	[0.73]	(14.32)	(12.07)	[1.37]	(14.96)	(10.85)	[1.75]
RR	0.01	0.01		0.02	-0.01		0.04	-0.02		0.05	-0.03	
Philippines 6/94 – 6/2001												
AR	-1.09	-0.21	-0.88	-0.60	-0.02	-0.58	-0.69	-0.34	-0.35	-0.19	-0.50	0.31
	(13.99)	(9.68)	[-1.13]	(12.71)	(11.03)	[-0.84]	(14.86)	(9.69)	[-0.40]	(14.64)	(9.93)	[0.34]
RR	-0.08	-0.02		-0.05	0.00		-0.05	-0.04		-0.01	-0.05	
Singapore 6/90 - 6/2001												
AR	0.32	0.73	-0.41	0.45	0.65	-0.19	0.62	0.58	0.05	0.67	0.38	0.29
	(10.83)	(8.39)	[-1.06]	(10.94)	(8.10)	[-0.46]	(11.08)	(8.06)	[0.10]	(10.67)	(8.48)	[0.65]
RR	0.03	0.09		0.04	0.08		0.06	0.07		0.06	0.04	
Taiwan 6/94 - 6/2001												
AR	-0.90	0.55	-1.45	-0.55	0.51	-1.06	-0.48	-0.23	-0.25	-0.45	-0.07	-0.38
	(8.72)	(8.58)	[-2.44]	(9.43)	(8.47)	[-1.65]	(9.31)	(9.17)	[-0.35]	(9.16)	(9.40)	[-0.53]
RR	-0.10	0.06		-0.06	0.06		-0.05	-0.02		-0.05	-0.01	
Thailand 6/93 - 6/2001												
AR	-1.26	-0.60	-0.66	0.29	0.07	0.23	0.17	-0.69	0.87	1.21	-1.35	2.56
	(9.39)	(8.35)	[-1.16]	(9.93)	(11.91)	[0.27]	(12.57)	(11.04)	[0.92]	(12.68)	(10.23)	[2.74]
RR	-0.13	-0.07		0.03	0.01		0.01	-0.06		0.10	-0.13	

Notes for Table I

Value and growth portfolios are formed on various models based on "P/B" Composite ratio as well as single factor valuation ratio P/B. Firms are weighted equally within each portfolio. We denote value (stocks in fractile 1) and growth (stocks in fractile 3) portfolios by V and G respectively and the difference between them V-G. The first row for each country is the average monthly return (AR). The second is the standard deviation of monthly returns in (parentheses) or t – statistic testing whether V-G is different from zero in [brackets]. The third row is the risk adjusted returns (RR) which is the ratio of AR to standard deviation of monthly returns.

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APPENDIX 2 – Table II – Monthly Returns for Equally Weighted Value and Growth Portfolios Sorted on P/E measures (based on Restricted Models)

	P/E MODEL A			P/E MODEL B			P/E MODEL C			P/E		
	V	G	V-G	V	G	V-G	V	G	V-G	V	G	V-G
Hong Kong 6/90-6/2001												
AR	1.01	0.75	0.25	0.97	0.85	0.12	1.13	0.70	0.42	1.00	0.63	0.37
	(9.67)	(8.88)	[0.92]	(10.05)	(8.84)	[0.39]	(9.95)	(9.22)	[1.34]	(9.71)	(9.23)	[1.15]
RR	0.10	0.08		0.10	0.10		0.11	0.08		0.10	0.07	
Indonesia 6/93-6/2001												
AR	-0.26	0.98	-1.23	-0.38	0.54	-0.91	0.35	0.00	0.35	0.75	-0.49	1.25
	(12.73)	(15.29)	[-1.50]	(11.30)	(16.20)	[-1.05]	(12.76)	(12.78)	[0.41]	(13.86)	(11.92)	[1.84]
RR	-0.02	0.06		-0.03	0.03		0.03	0.00		0.05	-0.04	
Japan 6/90 - 6/2001												
AR	-0.44	-0.48	0.04	-0.45	-0.48	0.03	-0.52	-0.48	-0.04	-0.30	-0.65	0.35
	(6.55)	(7.38)	[0.19]	(6.58)	(7.44)	[0.17]	(6.87)	(7.40)	[-0.22]	(6.69)	(7.28)	[1.80]
RR	-0.07	-0.06		-0.07	-0.06		-0.08	-0.06		-0.04	-0.09	
Korea 6/93 - 6/2001												
AR	0.03	-0.17	0.20	-0.10	-0.31	0.21	0.29	-0.44	0.74	0.23	-0.37	0.60
	(11.35)	(12.15)	[0.49]	(11.02)	(12.26)	[0.45]	(11.93)	(12.17)	[2.06]	(12.45)	(12.38)	[1.10]
RR	0.00	-0.01		-0.01	-0.03		0.02	-0.04		0.02	-0.03	
Malaysia 6/93 - 6/2001												
AR	-0.14	0.54	-0.68	-0.07	0.54	-0.60	0.31	0.19	0.12	0.83	-0.33	1.16
	(13.48)	(13.43)	[-1.88]	(13.02)	(12.94)	[-1.71]	(13.27)	(13.05)	[0.32]	(13.52)	(13.15)	[3.30]
RR	-0.01	0.04		-0.01	0.04		0.02	0.01		0.06	-0.03	
Philippines 6/94 - 6/2001												
AR	-0.94	0.26	-1.20	-0.55	0.08	-0.64	-0.11	-0.38	0.28	0.36	-1.35	1.73
	(14.05)	(10.23)	[-1.66]	(12.95)	(12.10)	[-1.19]	(14.24)	(11.43)	[0.35]	(14.24)	(11.26)	[2.28]
RR	-0.07	0.03		-0.04	0.01		-0.01	-0.03		0.03	-0.12	
Singapore 6/90 - 6/2001												
AR	0.68	0.48	0.20	0.70	0.48	0.22	0.94	0.19	0.75	0.99	0.22	0.78
	(9.67)	(9.99)	[0.67]	(9.91)	(9.90)	[0.74]	(9.88)	(9.24)	[3.02]	(9.39)	(10.00)	[2.60]
RR	0.07	0.05		0.07	0.05		0.10	0.02		0.11	0.02	
Taiwan 6/94 - 6/2001												
AR	-0.79	-0.15	-0.64	-0.13	-0.18	0.05	-0.17	-0.21	0.05	0.01	-0.60	0.61
	(8.52)	(8.77)	[-1.58]	(8.89)	(8.52)	[0.10]	(8.77)	(9.39)	[0.08]	(8.33)	(9.13)	[1.25]
RR	-0.09	-0.02		-0.02	-0.02		-0.02	-0.02		0.00	-0.07	
Thailand 6/93 - 6/2001												
AR	0.37	-0.18	0.55	-0.34	0.08	-0.42	0.58	-1.24	1.84	0.97	-1.41	2.41
	(14.17)	(8.28)	[0.60]	(12.64)	(10.88)	[-0.51]	(14.37)	(9.38)	[1.84]	(13.41)	(9.39)	[2.53]
RR	0.03	-0.02		-0.03	0.01		0.04	-0.13		0.07	-0.15	

Notes for Table II

Value and growth portfolios are formed on various models based on "P/E" Composite ratio as well as single factor valuation ratio P/E. Firms are weighted equally within each portfolio. We denote value (stocks in fractile 1) and growth (stocks in fractile 3) portfolios by V and G respectively and the difference between them V-G. The first row for each country is the average monthly return (AR). The second is the standard deviation of monthly returns in (parentheses) or t – statistic testing whether V-G is different from zero in [brackets]. The third row is the risk adjusted returns (RR) which is the ratio of AR to standard deviation of monthly returns.

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APPENDIX 2 – Table III – Monthly Returns for Equally Weighted Value and Growth Portfolios Sorted on P/Sales measures (based on Restricted Models)

	P/Sales MODEL A			P/Sales MODEL B			P/Sales MODEL C			P/Sales		
	V	G	V-G	V	G	V-G	V	G	V-G	V	G	V-G
Hong Kong 6/90-6/2001												
AR	0.82	1.05	-0.24	0.70	0.99	-0.29	1.07	0.83	0.24	0.74	0.88	-0.14
	(8.99)	(9.38)	[-0.71]	(9.20)	(9.42)	[-0.83]	(9.04)	(9.70)	[0.68]	(9.21)	(9.38)	[-0.39]
RR	0.09	0.11		0.08	0.10		0.12	0.09		0.08	0.09	
Indonesia 6/93-6/2001												
AR	0.54	-0.41	0.96	1.10	-0.07	1.17	1.19	-0.20	1.40	1.01	-1.08	2.12
	(14.22)	(11.76)	[1.13]	(15.10)	(11.72)	[1.31]	(17.09)	(11.30)	[1.08]	(16.33)	(11.89)	[2.04]
RR	0.04	-0.04		0.07	-0.01		0.07	-0.02		0.06	-0.09	
Japan 6/90 - 6/2001												
AR	-0.55	-0.40	-0.15	-0.53	-0.39	-0.14	-0.49	-0.39	-0.09	-0.44	-0.45	0.01
	(7.20)	(6.63)	[-0.83]	(7.10)	(6.65)	[-0.80]	(7.55)	(6.58)	[-0.40]	(7.29)	(6.59)	[0.05]
RR	-0.08	-0.06		-0.07	-0.06		-0.06	-0.06		-0.06	-0.07	
Korea 6/93 - 6/2001												
AR	0.04	-0.05	0.09	-0.10	0.01	-0.11	0.22	-0.41	0.64	0.11	-0.61	0.72
	(12.91)	(11.44)	[0.16]	(12.79)	(11.43)	[-0.20]	(13.32)	(11.45)	[1.03]	(13.76)	(11.17)	[0.97]
RR	0.00	-0.00		-0.01	0.00		0.02	-0.04		0.01	-0.05	
Malaysia 6/93 - 6/2001												
AR	0.52	0.22	0.30	0.31	0.30	0.01	0.51	-0.03	0.53	0.58	-0.22	0.80
	(15.14)	(11.58)	[0.58]	(15.32)	(11.28)	[0.02]	(14.57)	(11.72)	[0.94]	(14.45)	(12.15)	[1.45]
RR	0.03	0.02		0.02	0.03		0.03	-0.00		0.04	-0.02	
Philippines 6/94 - 6/2001												
AR	-0.99	-0.16	-0.82	-0.42	-0.41	-0.01	-0.83	-0.51	-0.32	-0.68	-0.50	-0.18
	(12.91)	(11.94)	[-1.43]	(10.96)	(13.45)	[-0.01]	(13.12)	(12.31)	[-0.56]	(12.86)	(11.71)	[-0.28]
RR	-0.08	-0.01		-0.04	-0.03		-0.06	-0.04		-0.05	-0.04	
Singapore 6/90 - 6/2001												
AR	0.49	0.36	0.13	0.68	0.41	0.26	0.84	0.31	0.53	0.76	0.20	0.56
	(11.07)	(8.41)	[0.38]	(11.00)	(8.43)	[0.76]	(11.05)	(8.55)	[1.57]	(11.07)	(8.69)	[1.50]
RR	0.04	0.04		0.06	0.05		0.08	0.04		0.07	0.02	
Taiwan 6/94 - 6/2001												
AR	-0.28	0.09	-0.37	-0.37	-0.14	-0.23	-0.13	-0.02	-0.12	0.05	-0.43	0.49
	(8.76)	(8.08)	[-0.99]	(8.88)	(7.97)	[-0.58]	(8.95)	(8.42)	[-0.22]	(8.69)	(8.26)	[1.23]
RR	-0.03	0.01		-0.04	-0.02		-0.02	-0.00		0.01	-0.05	
Thailand 6/93 - 6/2001												
AR	-0.15	-0.06	-0.09	-0.24	-0.34	0.11	0.15	-0.49	0.64	0.79	-0.87	1.67
	(9.83)	(11.88)	[-0.13]	(9.04)	(13.32)	[0.13]	(10.32)	(11.95)	[0.80]	(9.97)	(12.04)	[2.10]
RR	-0.02	-0.01		-0.03	-0.03		0.01	-0.04		0.08	-0.07	

Notes for Table III

Value and growth portfolios are formed on various models based on "P/Sales" Composite ratio as well as single factor valuation ratio P/Sales. Firms are weighted equally within each portfolio. We denote value (stocks in fractile 1) and growth (stocks in fractile 3) portfolios by V and G respectively and the difference between them V-G. The first row for each country is the average monthly return (AR). The second is the standard deviation of monthly returns in (parentheses) or t – statistic testing whether V-G is different from zero in [brackets]. The third row is the risk adjusted returns (RR) which is the ratio of AR to standard deviation of monthly returns.

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APPENDIX 2 – Table IV – Monthly Returns for Equally Weighted Value and Growth Portfolios Sorted on P/D measures (based on Restricted Models)

	P/D MODEL A			P/D MODEL B			P/D MODEL C			P/D		
	V	G	V-G	V	G	V-G	V	G	V-G	V	G	V-G
Hong Kong 6/90-6/2001												
AR	0.82	0.83	-0.01	0.50	1.33	-0.82	0.68	0.59	0.09	1.05	0.61	0.43
	(8.99)	(9.76)	[-0.04]	(10.05)	(9.20)	[-2.60]	(9.12)	(10.25)	[0.22]	(9.00)	(10.31)	[1.21]
RR	0.09	0.08		0.05	0.14		0.07	0.06		0.12	0.06	
Indonesia 6/93-6/2001												
AR	0.35	0.20	0.16	0.59	-0.37	0.97	1.05	-0.42	1.47	1.08	-0.34	1.42
	(12.70)	(12.93)	[0.22]	(14.20)	(12.59)	[0.94]	(15.71)	(12.07)	[1.24]	(15.22)	(11.14)	[1.29]
RR	0.03	0.02		0.04	-0.03		0.07	-0.03		0.07	-0.03	
Japan 6/90 - 6/2001												
AR	-0.39	-0.50	0.11	-0.47	-0.46	-0.01	-0.42	-0.52	0.10	-0.31	-0.59	0.28
	(6.82)	(6.87)	[0.74]	(7.25)	(6.58)	[-0.02]	(7.63)	(6.33)	[0.38]	(7.40)	(6.39)	[1.13]
RR	-0.06	-0.07		-0.06	-0.07		-0.06	-0.08		-0.04	-0.09	
Korea 6/93 - 6/2001												
AR	-0.28	0.15	-0.44	-0.04	-0.25	0.21	0.06	-0.72	0.79	0.18	-0.17	0.35
	(12.43)	(11.40)	[-0.89]	(12.13)	(11.90)	[0.40]	(13.06)	(11.58)	[1.08]	(12.92)	(11.83)	[0.49]
RR	-0.02	0.01		-0.00	-0.02		0.00	-0.06		0.01	-0.01	
Malaysia 6/93 - 6/2001												
AR	0.27	0.11	0.16	0.33	-0.01	0.34	0.85	-0.19	1.05	1.21	-0.33	1.55
	(15.46)	(10.90)	[0.26]	(13.30)	(12.97)	[0.83]	(12.89)	(13.06)	[1.79]	(12.69)	(13.21)	[2.99]
RR	0.02	0.01		0.02	-0.00		0.07	-0.01		0.10	-0.03	
Philippines 6/94 - 6/2001												
AR	-0.61	0.49	-1.10	0.15	-0.11	0.26	-0.08	-0.25	0.17	0.28	-0.59	0.87
	(10.67)	(11.11)	[-1.41]	(14.44)	(11.04)	[0.24]	(10.94)	(13.03)	[0.16]	(12.30)	(9.55)	[1.05]
RR	-0.06	0.04		0.01	-0.01		-0.01	-0.02		0.02	-0.06	
Singapore 6/90 - 6/2001												
AR	0.38	0.80	-0.42	0.41	0.88	-0.47	0.65	0.48	0.17	0.73	0.32	0.41
	(11.00)	(8.15)	[-1.18]	(10.68)	(8.71)	[-1.23]	(11.28)	(8.83)	[0.36]	(9.47)	(9.60)	[1.11]
RR	0.03	0.10		0.04	0.10		0.06	0.05		0.08	0.03	
Taiwan 6/94 - 6/2001												
AR	-0.49	0.18	-0.66	-0.24	0.02	-0.26	-0.17	0.18	-0.35	-0.50	0.33	-0.83
	(7.65)	(9.88)	[-0.91]	(7.77)	(9.68)	[-0.35]	(7.95)	(10.06)	[-0.44]	(7.97)	(9.72)	[-1.02]
RR	-0.06	0.02		-0.03	0.00		-0.02	0.02		-0.06	0.03	
Thailand 6/93 - 6/2001												
AR	0.17	-0.52	0.69	0.22	-0.44	0.66	0.09	-0.81	0.91	0.96	-1.19	2.18
	(11.35)	(10.00)	[0.98]	(9.94)	(13.03)	[0.73]	(11.98)	(10.29)	[0.99]	(11.56)	(10.78)	[2.45]
RR	0.01	-0.05		0.02	-0.03		0.01	-0.08		0.08	-0.11	

Notes for Table IV

Value and growth portfolios are formed on various models based on "P/D" Composite ratio as well as single factor valuation ratio P/D. Firms are weighted equally within each portfolio. We denote value (stocks in fractile 1) and growth (stocks in fractile 3) portfolios by V and G respectively and the difference between them V-G. The first row for each country is the average monthly return (AR). The second is the standard deviation of monthly returns in (parentheses) or t – statistic testing whether V-G is different from zero in [brackets]. The third row is the risk adjusted returns (RR) which is the ratio of AR to standard deviation of monthly returns.

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APPENDIX 2 – Table V – Monthly Returns for Market Capitalisation Weighted Value and Growth Portfolios Sorted on P/B measures (based on Restricted Models)

	P/B MODEL A			P/B MODEL B			P/B MODEL C			P/B		
	V	G	V-G	V	G	V-G	V	G	V-G	V	G	V-G
Hong Kong 6/90-6/2001												
AR	0.46	1.39	-0.93	0.80	1.43	-0.63	0.89	1.25	-0.35	0.89	1.18	-0.30
	(11.40)	(8.13)	[-1.49]	(11.20)	(8.07)	[-1.07]	(11.19)	(8.43)	[-0.60]	(10.93)	(8.33)	[-0.50]
RR	0.04	0.17		0.07	0.18		0.08	0.15		0.08	0.14	
Indonesia 6/93-6/2001												
AR	-0.96	0.99	-1.95	-0.19	0.67	-0.86	0.15	0.15	0.00	0.53	0.47	0.07
	(13.27)	(11.59)	[-1.78]	(13.35)	(11.96)	[-0.87]	(14.76)	(12.00)	[0.00]	(15.13)	(11.90)	[0.06]
RR	-0.07	0.09		-0.01	0.06		0.01	0.01		0.04	0.04	
Japan 6/90 – 6/2001												
AR	-0.36	-0.21	-0.15	-0.46	-0.17	-0.29	-0.31	-0.23	-0.08	-0.17	-0.43	0.26
	(6.12)	(6.17)	[-0.51]	(6.22)	(6.16)	[-0.90]	(6.84)	(6.17)	[-0.18]	(6.47)	(6.48)	[0.62]
RR	-0.06	-0.03		-0.07	-0.03		-0.04	-0.04		-0.03	-0.07	
Korea 6/93 – 6/2001												
AR	-0.83	1.10	-1.92	-0.03	0.51	-0.54	0.93	-0.31	1.25	-0.48	0.42	-0.90
	(11.12)	(12.60)	[-2.46]	(12.65)	(12.72)	[-0.56]	(14.56)	(12.61)	[1.11]	(12.68)	(12.57)	[-0.86]
RR	-0.07	0.09		-0.00	0.04		0.06	-0.02		-0.04	0.03	
Malaysia 6/93 – 6/2001												
AR	0.12	-0.22	0.35	0.20	-0.26	0.46	0.73	-0.31	1.04	1.01	-0.23	1.23
	(13.49)	(9.02)	[0.54]	(13.10)	(9.23)	[0.75]	(12.53)	(10.34)	[1.35]	(13.27)	(9.51)	[1.73]
RR	0.01	-0.02		0.02	-0.03		0.06	-0.03		0.08	-0.02	
Philippines 6/94 – 6/2001												
AR	-0.73	-0.35	-0.39	-0.70	-0.25	-0.44	-0.50	-0.37	-0.12	-0.59	-0.37	-0.22
	(11.03)	(9.36)	[-0.49]	(10.25)	(10.42)	[-0.52]	(12.38)	(10.41)	[-0.16]	(14.26)	(9.52)	[-0.22]
RR	-0.07	-0.04		-0.07	-0.02		-0.04	-0.04		-0.04	-0.04	
Singapore 6/90 - 6/2001												
AR	-0.04	0.16	-0.21	0.04	0.17	-0.13	0.01	0.35	-0.33	0.35	0.29	0.06
	(10.56)	(6.57)	[-0.32]	(10.40)	(6.50)	[-0.21]	(10.33)	(6.96)	[-0.55]	(9.51)	(7.09)	[0.10]
RR	-0.00	0.02		0.00	0.03		0.00	0.05		0.04	0.04	
Taiwan 6/94 - 6/2001												
AR	-0.44	1.04	-1.48	-0.50	0.80	-1.30	0.11	0.16	-0.05	0.16	0.30	-0.14
	(8.92)	(9.74)	[-1.64]	(9.37)	(9.53)	[-1.83]	(9.85)	(10.18)	[-0.06]	(9.76)	(9.87)	[-0.17]
RR	-0.05	0.11		-0.05	0.08		0.01	0.02		0.02	0.03	
Thailand 6/93 - 6/2001												
AR	-1.59	-1.36	-0.24	-0.40	-1.52	1.12	-0.98	-1.50	0.53	-0.21	-1.53	1.33
	(10.48)	(10.45)	[-0.27]	(10.32)	(11.53)	[1.17]	(14.31)	(11.45)	[0.52]	(13.39)	(10.89)	[1.39]
RR	-0.15	-0.13		-0.04	-0.13		-0.07	-0.13		-0.02	-0.14	

Notes for Table V

Value and growth portfolios are formed on various models based on "P/B" Composite ratio as well as single factor valuation ratio P/B. Firms are weighted by their market capitalisation within each portfolio. We denote value (stocks in fractile 1) and growth (stocks in fractile 3) portfolios by V and G respectively and the difference between them V-G. The first row for each country is the average monthly return (AR). The second is the standard deviation of monthly returns in (parentheses) or t – statistic testing whether V-G is different from zero in [brackets]. The third row is the risk adjusted returns (RR) which is the ratio of AR to standard deviation of monthly returns.

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APPENDIX 2 – Table VI – Monthly Returns for Market Capitalisation Weighted Value and Growth Portfolios Sorted on P/E measures (based on Restricted Models)

	P/E MODEL A			P/E MODEL B			P/E MODEL C			P/E		
	V	G	V-G	V	G	V-G	V	G	V-G	V	G	V-G
Hong Kong 6/90-6/2001												
AR	1.33	1.34	-0.01	0.73	0.78	-0.05	1.44	0.88	0.55	0.93	1.12	-0.20
	(10.33)	(9.25)	[-0.03]	(8.38)	(7.11)	[-0.20]	(10.34)	(9.20)	[1.21]	(10.19)	(9.09)	[-0.41]
RR	0.13	0.15		0.09	0.11		0.14	0.10		0.09	0.12	
Indonesia 6/93-6/2001												
AR	-0.41	-0.13	-0.29	-0.13	-1.27	1.16	0.44	-0.80	1.25	0.31	0.14	0.16
	(12.54)	(13.03)	[-0.31]	(11.27)	(13.60)	[1.19]	(13.06)	(13.10)	[1.09]	(13.92)	(12.04)	[0.16]
RR	-0.03	-0.01		-0.01	-0.09		0.03	-0.06		0.02	0.01	
Japan 6/90 - 6/2001												
AR	-0.05	-0.41	0.36	-0.06	-0.40	0.34	-0.16	-0.56	0.41	0.11	-0.45	0.56
	(6.11)	(6.24)	[0.98]	(6.27)	(6.37)	[0.94]	(6.12)	(6.53)	[1.28]	(5.78)	(6.92)	[1.49]
RR	-0.01	-0.07		-0.01	-0.06		-0.03	-0.09		0.02	-0.06	
Korea 6/93 - 6/2001												
AR	1.13	-0.35	1.48	0.94	-0.89	1.85	0.30	-0.99	1.30	-0.00	-0.09	0.09
	(13.20)	(12.20)	[1.94]	(13.65)	(10.98)	[1.85]	(13.12)	(11.24)	[1.56]	(12.51)	(12.92)	[0.09]
RR	0.09	-0.03		0.07	-0.08		0.02	-0.09		0.00	-0.01	
Malaysia 6/93 - 6/2001												
AR	-0.27	0.60	-0.86	-0.40	0.62	-1.02	0.27	0.20	0.08	0.63	-0.50	1.13
	(11.57)	(10.54)	[-1.56]	(10.94)	(10.00)	[-1.96]	(10.98)	(10.45)	[0.13]	(11.48)	(10.71)	[2.43]
RR	-0.02	0.06		-0.04	0.06		0.02	0.02		0.05	-0.05	
Philippines 6/94 - 6/2001												
AR	-1.05	-0.16	-0.89	-0.54	-0.06	-0.48	-0.40	-0.31	-0.10	-0.46	-0.66	0.20
	(13.75)	(9.61)	[-0.82]	(12.34)	(8.75)	[-0.46]	(12.62)	(9.19)	[-0.11]	(12.03)	(9.77)	[0.21]
RR	-0.08	-0.02		-0.04	-0.01		-0.03	-0.03		-0.04	-0.07	
Singapore 6/90 - 6/2001												
AR	0.14	-0.11	0.24	0.37	-0.10	0.47	0.69	-0.12	0.81	1.12	-0.24	1.37
	(8.31)	(9.30)	[0.63]	(8.50)	(9.26)	[1.32]	(8.22)	(8.35)	[1.48]	(8.69)	(8.79)	[2.19]
RR	0.02	-0.01		0.04	-0.01		0.08	-0.01		0.13	-0.03	
Taiwan 6/94 - 6/2001												
AR	-0.60	0.36	-0.96	0.38	0.27	0.12	0.38	0.31	0.08	0.66	-0.30	0.96
	(8.77)	(8.70)	[-1.39]	(9.99)	(8.53)	[0.14]	(9.47)	(10.15)	[0.08]	(8.64)	(9.31)	[1.26]
RR	-0.07	0.04		0.04	0.03		0.04	0.03		0.08	-0.03	
Thailand 6/93 - 6/2001												
AR	-0.62	-1.14	0.53	-1.12	-0.89	-0.23	-0.75	-2.07	1.36	-0.27	-1.74	1.50
	(13.07)	(9.87)	[0.62]	(12.82)	(13.49)	[-0.23]	(17.18)	(10.46)	[1.16]	(13.55)	(10.68)	[1.37]
RR	-0.05	-0.12		-0.09	-0.07		-0.04	-0.20		-0.02	-0.16	

Notes for Table VI

Value and growth portfolios are formed on various models based on "P/E" Composite ratio as well as single factor valuation ratio P/E. Firms are weighted by their market capitalisation within each portfolio. We denote value (stocks in fractile 1) and growth (stocks in fractile 3) portfolios by V and G respectively and the difference between them V-G. The first row for each country is the average monthly return (AR). The second is the standard deviation of monthly returns in (parentheses) or t – statistic testing whether V-G is different from zero in [brackets]. The third row is the risk adjusted returns (RR) which is the ratio of AR to standard deviation of monthly returns.

Chapter 5 – Fundamental Drivers of Value and Growth Stocks

APPENDIX 2 – Table VII – Monthly Returns for Market Capitalisation Weighted Value and Growth Portfolios Sorted on P/Sales measures (based on Restricted Models)

	P/Sales MODEL A			P/Sales MODEL B			P/Sales MODEL C			P/Sales		
	V	G	V-G	V	G	V-G	V	G	V-G	V	G	V-G
Hong Kong 6/90-6/2001												
AR	0.70	1.62	-0.90	0.39	1.22	-0.82	1.37	1.06	0.31	1.07	1.21	-0.13
	(8.73)	(9.47)	[-2.19]	(9.27)	(9.02)	[-1.88]	(8.82)	(9.47)	[0.71]	(8.64)	(9.24)	[-0.31]
RR	0.08	0.17		0.04	0.14		0.16	0.11		0.12	0.13	
Indonesia 6/93-6/2001												
AR	-0.34	-0.49	0.15	1.52	-0.19	1.71	1.74	0.60	1.14	0.18	-0.08	0.27
	(12.40)	(12.65)	[0.13]	(12.40)	(12.76)	[1.73]	(13.98)	(12.88)	[1.10]	(15.50)	(11.89)	[0.22]
RR	-0.03	-0.04		0.12	-0.01		0.12	0.05		0.01	-0.01	
Japan 6/90 - 6/2001												
AR	-0.46	-0.10	-0.36	-0.50	-0.08	-0.42	-0.33	-0.09	-0.25	-0.30	-0.25	-0.05
	(6.38)	(6.27)	[-1.14]	(6.40)	(6.29)	[-1.28]	(6.64)	(6.26)	[-0.61]	(6.53)	(6.34)	[-0.13]
RR	-0.07	-0.02		-0.08	-0.01		-0.05	-0.01		-0.05	-0.04	
Korea 6/93 - 6/2001												
AR	-0.64	0.19	-0.82	-0.01	0.35	-0.36	0.38	-0.05	0.44	-0.27	0.24	-0.51
	(11.57)	(11.35)	[-1.28]	(12.87)	(11.45)	[-0.42]	(13.52)	(11.28)	[0.43]	(13.25)	(11.58)	[-0.53]
RR	-0.06	0.02		-0.00	0.03		0.03	-0.00		-0.02	0.02	
Malaysia 6/93 - 6/2001												
AR	0.42	-0.26	0.68	0.05	0.02	0.04	0.49	-0.44	0.94	0.31	-0.51	0.82
	(12.80)	(8.77)	[1.03]	(13.13)	(8.51)	[0.06]	(12.98)	(9.27)	[1.41]	(12.60)	(9.68)	[1.23]
RR	0.03	-0.03		0.00	0.00		0.04	-0.05		0.02	-0.05	
Philippines 6/94 - 6/2001												
AR	-0.58	-0.57	-0.01	-0.49	-0.80	0.31	-0.66	-0.60	-0.06	-0.76	-0.38	-0.39
	(9.89)	(10.81)	[-0.01]	(9.84)	(11.40)	[0.34]	(11.05)	(10.53)	[-0.09]	(11.70)	(10.68)	[-0.54]
RR	-0.06	-0.05		-0.05	-0.07		-0.06	-0.06		-0.07	-0.04	
Singapore 6/90 - 6/2001												
AR	0.01	0.14	-0.14	0.09	0.21	-0.12	0.41	0.13	0.28	0.37	0.21	0.16
	(10.97)	(6.53)	[-0.20]	(10.62)	(6.26)	[-0.18]	(9.58)	(6.76)	[0.54]	(10.08)	(7.21)	[0.29]
RR	0.00	0.02		0.01	0.03		0.04	0.02		0.04	0.03	
Taiwan 6/94 - 6/2001												
AR	-0.05	0.79	-0.84	-0.27	0.53	-0.81	0.25	0.49	-0.24	0.15	0.15	-0.00
	(9.18)	(9.32)	[-1.41]	(9.35)	(9.20)	[-1.41]	(9.02)	(9.47)	[-0.32]	(8.51)	(9.57)	[-0.00]
RR	-0.01	0.08		-0.03	0.06		0.03	0.05		0.02	0.02	
Thailand 6/93 - 6/2001												
AR	-1.47	-0.78	-0.70	-0.95	-1.22	0.28	-0.67	-1.17	0.50	-0.24	-1.41	1.19
	(11.13)	(11.10)	[-0.87]	(10.70)	(11.96)	[0.28]	(12.30)	(11.85)	[0.56]	(11.23)	(12.25)	[1.30]
RR	-0.13	-0.07		-0.09	-0.10		-0.05	-0.10		-0.02	-0.12	

Notes for Table VII

Value and growth portfolios are formed on various models based on "P/Sales" Composite ratio as well as single factor valuation ratio P/Sales. Firms are weighted by their market capitalisation within each portfolio. We denote value (stocks in fractile 1) and growth (stocks in fractile 3) portfolios by V and G respectively and the difference between them V-G. The first row for each country is the average monthly return (AR). The second is the standard deviation of monthly returns in (parentheses) or t – statistic testing whether V-G is different from zero in [brackets]. The third row is the risk adjusted returns (RR) which is the ratio of AR to standard deviation of monthly returns.

Chapter 5 – Fundamental Drivers of Value and Growth Stocks

APPENDIX 2 – Table VIII – Monthly Returns for Market Capitalisation Weighted Value and Growth Portfolios Sorted on P/D measures (based on Restricted Models)

	P/D MODEL A			P/D MODEL B			P/D MODEL C			P/D		
	V	G	V-G	V	G	V-G	V	G	V-G	V	G	V-G
Hong Kong 6/90-6/2001												
AR	1.02	0.96	0.07	1.20	0.97	0.23	0.86	0.93	-0.06	1.24	1.06	0.18
	(8.18)	(10.23)	[0.17]	(10.36)	(9.33)	[0.49]	(8.97)	(9.80)	[-0.13]	(9.21)	(9.49)	[0.49]
RR	0.12	0.09		0.12	0.10		0.10	0.09		0.13	0.11	
Indonesia 6/93-6/2001												
AR	1.24	0.71	0.53	0.67	0.07	0.60	1.49	-0.18	1.67	0.49	0.16	0.33
	(9.94)	(13.09)	[0.50]	(10.59)	(12.62)	[0.53]	(14.08)	(12.06)	[1.31]	(12.50)	(12.06)	[0.31]
RR	0.13	0.05		0.06	0.01		0.11	-0.01		0.04	0.01	
Japan 6/90 - 6/2001												
AR	-0.13	-0.27	0.14	-0.35	-0.21	-0.14	-0.13	-0.26	0.13	-0.13	-0.24	0.11
	(6.28)	(5.97)	[0.62]	(6.23)	(6.43)	[-0.39]	(6.61)	(6.29)	[0.31]	(5.99)	(6.22)	[0.28]
RR	-0.02	-0.05		-0.06	-0.03		-0.02	-0.04		-0.02	-0.04	
Korea 6/93 - 6/2001												
AR	0.10	0.07	0.03	-0.72	0.67	-1.37	-0.16	0.33	-0.49	-0.31	0.55	-0.86
	(12.08)	(10.87)	[0.05]	(11.26)	(12.27)	[-1.95]	(13.82)	(12.73)	[-0.43]	(12.09)	(12.30)	[-0.74]
RR	0.01	0.01		-0.06	0.05		-0.01	0.03		-0.03	0.04	
Malaysia 6/93 - 6/2001												
AR	0.07	-0.08	0.15	0.31	-0.16	0.47	0.74	-0.39	1.13	1.31	-0.33	1.65
	(13.90)	(8.88)	[0.19]	(11.14)	(10.95)	[0.75]	(11.70)	(11.62)	[1.31]	(10.83)	(11.18)	[2.47]
RR	0.00	-0.01		0.03	-0.01		0.06	-0.03		0.12	-0.03	
Philippines 6/94 - 6/2001												
AR	-0.67	0.11	-0.79	-0.51	-0.48	-0.03	-0.57	-0.44	-0.13	-0.48	-0.35	-0.13
	(11.19)	(8.58)	[-0.92]	(10.70)	(9.45)	[-0.04]	(8.37)	(9.38)	[-0.16]	(10.38)	(9.60)	[-0.17]
RR	-0.06	0.01		-0.05	-0.05		-0.07	-0.05		-0.05	-0.04	
Singapore 6/90 - 6/2001												
AR	-0.03	0.24	-0.27	0.04	0.40	-0.36	0.55	0.02	0.53	0.49	-0.32	0.82
	(10.13)	(7.22)	[-0.41]	(9.59)	(7.39)	[-0.55]	(9.70)	(9.17)	[0.73]	(8.50)	(9.18)	[1.41]
RR	-0.00	0.03		0.00	0.05		0.06	0.00		0.06	-0.04	
Taiwan 6/94 - 6/2001												
AR	-0.47	-0.06	-0.41	-0.11	-0.07	-0.03	-0.01	0.07	-0.08	-0.06	0.12	-0.18
	(7.82)	(9.94)	[-0.50]	(7.80)	(9.93)	[-0.04]	(7.76)	(9.97)	[-0.09]	(7.30)	(9.83)	[-0.20]
RR	-0.06	-0.01		-0.01	-0.01		-0.00	0.01		-0.01	0.01	
Thailand 6/93 - 6/2001												
AR	-0.50	-0.64	0.14	-0.26	-0.69	0.43	-0.36	-0.87	0.52	-0.03	-0.95	0.92
	(11.26)	(10.60)	[0.16]	(10.39)	(13.38)	[0.41]	(10.88)	(11.29)	[0.52]	(11.93)	(10.93)	[0.77]
RR	-0.04	-0.06		-0.03	-0.05		-0.03	-0.08		-0.00	-0.09	

Notes for Table VIII

Value and growth portfolios are formed on various models based on "P/D" Composite ratio as well as single factor valuation ratio P/D. Firms are weighted by their market capitalisation within each portfolio. We denote value (stocks in fractile 1) and growth (stocks in fractile 3) portfolios by V and G respectively and the difference between them V-G. The first row for each country is the average monthly return (AR). The second is the standard deviation of monthly returns in (parentheses) or t – statistic testing whether V-G is different from zero in [brackets]. The third row is the risk adjusted returns (RR) which is the ratio of AR to standard deviation of monthly returns.

Chapter 6
Role of Expectational Error due to Extrapolation of Past Performance on the Performance of Value and Growth Stocks

Chapter 6 – Role of Expectational Error due to Extrapolation of Past Performance on the Performance of Value and Growth Stocks

6.1 Objective

The purpose of this chapter is to examine the role of expectational error caused by extrapolation of past performance on the performance of value and growth stocks in Asian Equity Markets. We use two measures as proxy for past performance:

- Past growth in earnings; and
- Historical price performance

6.2 Motivation

Empirical results in Chapter 4 do not agree with the Fama and French hypothesis that the superior performance of value strategies is due to risk compensation. This chapter therefore relies on elements of behavioural finance and market inefficiency to provide explanations behind the value/growth effect.

We determine whether expectational error explains the superior performance of value strategies. As mentioned earlier, there may be many different sources of expectational errors but there has not been a common consensus on the sources of extreme expectations that cause overreaction among investors and analysts.

In this chapter, we aim to identify whether strategies that are contrarian to 'naïve' strategies driven by extrapolation of past performance explain the superior performance of value strategies in Asian Equity Markets. Whilst such extrapolative expectations may not be the only source of mis-pricing for value and growth stocks, they represent a testable alternative hypothesis. We make use of the following measures to determine past performance:

- Past growth in earnings; and
- Historical price performance

Chapter 6 – Role of Expectational Error due to Extrapolation of Past Performance on the Performance of Value and Growth Stocks

6.3 Hypothesis

Hypothesis I:Extrapolation of past performance causes a mispricing in value and growth stocks which justify the difference in their subsequent returns.

The above hypothesis implies that we would expect the returns of growth stocks (high P/B, P/E or P/Sales ratios) which had a good record of past performance to be lower than the returns of growth stocks that had performed poorly in the past (temporary 'losers'). Similarly, if investors extrapolate the past, then value stocks with disappointing previous performance should outperform temporary 'winners'.

As noted by Lakonishok et al (1994), the realization of actual future growth rates of earnings, cash flow and sales of 'glamour' stocks relative to 'value' stocks turn out to be much lower than they were in the past or as the multiples on those stocks indicate the market expected them to be. According to the expectational error theory, this creates a positive surprise for value stocks following excessive pessimism which pushes their prices up and a negative surprise for growth stocks following excessive optimism pushing their prices down. Value strategies invest disproportionately in stocks that are underpriced and underinvest in stocks that are overpriced causing them to produce superior returns.

Both Lakonishok et al (1994) and De Bondt et al (1985, 1987) showed evidence that overreaction to the equity markets is caused by extrapolation of past performance. They showed that strategies that are contrarian to 'naïve' strategies followed by most investors based on extrapolation of past performance produce superior returns which explain the difference in returns between value and growth stocks.

Past earnings growth and historical price performance have been highlighted as measures of proxy for past performance by Lakonishok et al (1994) and De Bondt et al (1985, 1987) respectively. We make use of these two measures as information on history of earnings and price performance is widely available. Reported earnings are also updated quarterly. Besides, as Asia undergoes restructuring in its corporate and financial structures, there is a growing shift in focus towards sustainable profitability and hence emphasis on earnings. It is quite likely that both past earnings growth and historical price performance are variables widely used in Asian Equity Markets to form expectations about future growth.

6.4 Methodology for testing Hypothesis

We conduct a number of tests to verify the extrapolation theory based on past earnings growth and historical price performance according to La Porta's studies to account for the value and growth spread in returns in Asian Equity Markets. We use two different measures as proxy for past performance in Asian Equity Markets:

- Past growth in earnings; and
- Historical price performance

In addition we use valuation ratios such as P/B, P/E and P/Sales to define value and growth stocks. We apply the following portfolio formation process below to compute the returns of value and growth portfolios of stocks.

At the end of each June over the sample period, 3 fractile portfolios are formed on the basis of different definitions for both value and growth portfolios. Portfolios are formed on both equal and market capitalization basis. Value portfolio refers to the group of stocks in the lowest fractile while growth portfolio refers to the group of stocks in the highest fractile. Firms are also sorted independently according to the two different measures of past performance (past earnings/sales growth, past price performance) using the above procedure. Thus, nine portfolios are then formed from the intersection of value and growth portfolios and past performance groups. Portfolios are rebalanced at the end of each June and returns are computed for each month beginning from July of each year until end of June the following year. The process is replicated across each country in this study. We only make use of companies with positive valuation ratios for P/B and P/E and available data for P/Sales in our data set.

6.5 Description of Company Specific Variables

3 years past earnings growth

3 years past earnings growth is computed as one of the measures of past performance used in extrapolations in Section 6.6.1. Computation of growth rates is complicated by several factors. First, growth rates cannot be computed when the base year observation is negative. This results in substantial missing values for earnings growth. Second, discrete annualized geometric growth rates can be extremely volatile when the base year is close to zero and when the base year or final year contains significant non-recurring items. To mitigate these problems, we follow the IBES procedure of computing 3 years past annualized growth rates by fitting a least squares growth line to the logarithms of the four annual earnings observations for each stock. Dechow and Sloan (1997) had also applied this methodology

in computing earnings/sales growth rates for their analysis. If earnings is missing or negative for either year t-3 or t, then we do not calculate growth rate for that observation.

3 years future earnings growth

3 years future earnings growth is computed using the same methodology as above. It is obtained by fitting an ordinary least squares line through logarithm of the 4 reported annual observations of earnings between fiscal years t and t+3.

1 year past earnings growth

Growth in net income between the fiscal years ending t-2 and t-1. We only use 1 year past earnings growth in our analysis so as not to reduce our sample size significantly especially for markets that do not have extensive data coverage preceding 1993.

1 year actual future earnings growth

Growth in net income between the fiscal years ending t and t+1.

6.6 Does Extrapolation of Past Performance Explain the Value/Growth Effect in Asian Equity Markets?

Before we proceed with the analysis of our results to determine whether extrapolation of past performance explains the superior performance of value strategies; we look at the evolution of profitability and price performance of value and growth portfolios in the Asian Equity Markets. Section 6.6.1 provides the preliminary analysis on the price performances and profitability patterns of value and growth portfolios. The preliminary evidence on the mean-reverting characteristics of value and growth portfolios helps provide a plausible basis that both investors and analysts form expectations about future growth by extrapolating past performance as postulated by the 'Expectational Error' theory.

Sections 6.6.2 and 6.6.3 aim to identify whether extreme expectations caused by extrapolating past growth in earnings and historical price performance explain the superior performance of value strategies. We document our conclusions in Section 6.6.4.

6.6.1 Descriptive Results of Portfolio Returns and Earnings Growth Characteristics

Before examining the profitability and price performance patterns of value and growth portfolios, we begin with a review of the 'Expectational Error' theory driven by extrapolation of past performance. Lakonishok et al (1994) postulated that investors and analysts naively extrapolate past trends in performance despite the fact that growth is mean-reverting.

Chapter 6 – Role of Expectational Error due to Extrapolation of Past Performance on the Performance of Value and Growth Stocks

Extrapolation implies that the future is expected to be similar to the past. If extrapolation of the past is prevalent, then overpriced 'glamour' stocks are likely to be those that performed well in the past and are expected to perform well in the future. Then value stocks are stocks with sluggish historical earnings growth and poor price performance and expected to continue its lackluster performance.

Table 6.1 below examines the returns and earnings growth characteristics of value and growth portfolios constructed on the basis of P/B ratio. The table shows the annualised holding period returns for 1 and 3 years before and after portfolio formation. It also captures both 1 and 3 years historical as well as future earnings growth. In order to reduce the influence of distortions in the data, all data used in this section is "winsorized".
The bottom 5% of the values for performance and earnings growth values are set equal to the values corresponding to the 5th percentile while the upper 5% of the values are set equal to the values corresponding to the 95th percentile.

Chapter 6 – Role of Expectational Error due to Extrapolation of Past Performance on the Performance of Value and Growth Stocks

Table 6.1 – Returns and Earnings Growth Patterns for Value and Growth Portfolios Formed on the Basis of P/B Ratio

Country	Value	Growth	Country	Value	Growth
Hong Kong	**(%)**	**(%)**	**Philippines**	**(%)**	**(%)**
Return t-3	-6.3	24.1	Return t-3	-18.6	-19.0
Return t-1	-7.5	41.8	Return t-1	-20.4	18.4
Return t+1	12.4	4.2	Return t+1	3.2	-9.6
Return t+3	2.2	3.0	Return t+3	-9.7	-10.0
EPS (t-3)	2.8	-3.1	EPS (t-3)	4.9	-3.0
EPS (t-1)	-9.1	11.1	EPS (t-1)	-46.8	14.6
EPS (t+1)	-6.2	7.5	EPS (t+1)	-52.0	10.0
EPS (t+3)	0.9	0.2	EPS (t+3)	8.5	2.43
Indonesia	**(%)**	**(%)**	**Singapore**	**(%)**	**(%)**
Return t-3	-6.0	26.0	Return t-3	4.2	21.6
Return t-1	1.4	52.0	Return t-1	1.1	19.0
Return t+1	64.1	-1.8	Return t+1	0.1	-1.5
Return t+3	16.2	0.2	Return t+3	2.9	2.0
EPS (t-3)	5.0	-5.3	EPS (t-3)	0.5	-5.5
EPS (t-1)	-18.4	1.1	EPS (t-1)	-5.4	14.9
EPS (t+1)	-30.7	-6.2	EPS (t+1)	-3.6	9.2
EPS (t+3)	-0.7	-1.8	EPS (t+3)	0.1	-0.6
Japan	**(%)**	**(%)**	**Thailand**	**(%)**	**(%)**
Return t-3	-11.9	2.0	Return t-3	-11.2	23.1
Return t-1	-12.7	7.9	Return t-1	-19.9	19.9
Return t+1	-2.2	-7.5	Return t+1	-16.9	-25.0
Return t+3	-4.8	-8.0	Return t+3	-14.6	-25.0
EPS (t-3)	5.4	0.3	EPS (t-3)	6.1	-4.3
EPS (t-1)	-43.0	-18.4	EPS (t-1)	-25.1	18.6
EPS (t+1)	-55.5	-15.5	EPS (t+1)	-13.7	-1.4
EPS (t+3)	4.2	2.3	EPS (t+3)	3.1	1.0
Korea	**(%)**	**(%)**	**Taiwan**	**(%)**	**(%)**
Return t-3	2.1	18.8	Return t-3	-4.6	23.8
Return t-1	-5.4	22.3	Return t-1	-8.7	39.5
Return t+1	-10.5	-11.5	Return t+1	-1.9	6.3
Return t+3	-13.6	-10.0	Return t+3	-12.7	-1.7
EPS (t-3)	5.4	-0.2	EPS (t-3)	1.9	-3.8
EPS (t-1)	-7.2	3.9	EPS (t-1)	-14.5	20.0
EPS (t+1)	-52.0	-32.7	EPS (t+1)	-21.6	20.4
EPS (t+3)	7.1	3.7	EPS (t+3)	1.7	-1.7
Malaysia	**(%)**	**(%)**			
Return t-3	20.0	44.7			
Return t-1	24.1	58.6			
Return t+1	29.4	17.7			
Return t+3	4.1	-0.4			
EPS (t-3)	-2.5	-6.6			
EPS (t-1)	24.6	26.2			
EPS (t+1)	26.3	26.1			
EPS (t+3)	-4.1	-2.3			

Notes for Table 6.1

Value (stocks in fractile 1) and growth (stocks in fractile 3) portfolios are formed on P/B. Firms are weighted equally within each portfolio. Rows 1-4 of each country show the annualised price performance of Value and Growth portfolios for 1 & 3 years before and after portfolio formation. In this case our sample has its last portfolio formation in June2000, where we analyse holding period returns from June 1998-June 1999 as well as returns from June 1998-June 2001 respectively. Rows 5-8 of each country show the average 1 & 3 years historical earnings growth as well as actual earnings performance 1 and 3 years after portfolio formation for both Value and Growth portfolios. 3 years earnings growth is obtained by fitting an ordinary least squares line through logarithm of the 4 most recently reported annual observations of earnings.

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The results are consistent with the findings of Bauman, Conover and Miller (1998), Capaul, Rowley and Sharpe (1993), Chan, Hamao and Lakonishok (1991), Fama and French (1997) and Levis and Liodakis (2001) that value portfolios formed on the basis of P/B ratio significantly outperform growth portfolios in the year immediately after formation. Six out of nine value portfolios continue to outperform growth portfolios in the next 3 years after portfolio formation.

It is interesting to note that that low P/B portfolios (value) exhibit poor relative performance against high P/B portfolios (growth) portfolios in years before portfolio formation. We observe that the annualised relative performances of all the value portfolios are in the range of -51% to -18% against growth portfolios for the 1 year period prior to portfolio formation. The poor relative performance of Value portfolios against growth portfolios persist even 3 years prior to portfolio formation except for Taiwan. It is probable that as a result of their poor relative performance, the market puts a downward price pressure on these stocks resulting in low P/B multiples. This results in these stocks being classified as 'value' stocks. Similarly, high P/B stocks become 'growth' stocks.

The results in Table 6.1 suggest that value portfolios are prior 'losers' that become new 'winners' in the years after portfolio formation. Similarly, we observe price performance reversals for the growth portfolios. The results seem to suggest that the P/B effect may be a manifestation of the winner-loser effect as documented by De Bondt et al (1985, 1987). De Bondt et al (1985, 1987) attributed the winner-loser effect based on historical price performance as the cause for extreme expectations. Similar to De Bondt et al, our results show contrarian strategies produce superior returns. Section 6.6.3 explores the issue whether extrapolation of historical price performance as the source of extreme expectations does explain the superior performance of value stocks relative to growth stocks.

We also observe that growth portfolios exhibit stronger earnings growth compared to value portfolios 1 year prior to portfolio formation. However, the relative earnings growth for growth portfolios against value portfolios decreases with time as observed in the 1 and 3 year post-formation periods. These observations suggest that earnings growth exhibit a mean reverting pattern for both value and growth portfolios. Levis et al (2001) had also recorded similar mean-reverting earnings growth patterns for value and growth portfolios in the UK market.

It is also interesting to note that the lower earnings growth pattern for value stocks relative to growth stocks did not persist 3 years prior to portfolio formations. Instead we observe in our results that the value portfolios exhibit higher earnings growth than growth portfolios 3 years prior to portfolio formation. However, this pattern reversed where value portfolios record lower earnings growth compared to growth portfolios 1 year prior to portfolio formation. This also provides empirical evidence that investors tend to 'price' stocks based on recent earnings trend within the last 1 year - such that stocks with high past growth within the last 1 year are 'priced' as growth stocks and stocks with low past growth within the last 1 year 'priced' as value stocks. This is despite the fact that earnings trends are not long lasting and mean-revert within a short time horizon of approximately 3 years as observed in the results.

The above observations on the persistence in performance away from fundamental values also suggest that both investors and analysts tend to overweight recent information and underweight prior information (De Bondt et al (1985, 1987), Kahneman and Tversky (1982)). De Bondt et al also highlight that investors and analysts tend to habitually extrapolate recent earnings trends into the future although earnings growth trends are mean-reverting.

The results in Table 6.1 show preliminary evidence that value stocks are prior 'losers' while growth stocks are prior 'winners'. We observe the reversal patterns in price performance and earnings growth for both value and growth portfolios (formed on P/B ratio) consistent with the extrapolation hypothesis. The results also suggest that strategies that are contrarian to 'naïve' strategies (based on extrapolation) followed by most investors earn superior returns.

We next determine in Sections 6.6.2 and 6.6.3 whether extreme expectations caused by extrapolating past growth in earnings and historical price performance explain the superior performance of value strategies.

6.6.2 Analysis of Results: Extrapolation of Past Growth in Earnings

We adopt the approach by La Porta (1996) to determine whether extrapolation of past performance is able to explain the difference in performance between value and growth strategies in Asian Equity Markets.

The implication of the extrapolation hypothesis is that we would expect the returns of growth stocks (high P/B, P/E or P/Sales ratios) that have good record of past performance to be lower than the returns of growth stocks that have performed poorly in the past (temporary 'losers'). Therefore, we would expect the t-statistics testing the difference in returns between stocks with low and high past performance to be positively significant. Similarly, if investors extrapolate the past, then value stocks with disappointing previous performance should outperform temporary winners. We use two measures as proxy for past performance:

- Past growth in earnings; and
- Historical price performance

Tables 6.2, 6.3 and 6.4 present the results of portfolios formed jointly using 1 year past earnings growth and valuation ratios P/B, P/E and P/Sales respectively. We report the results from portfolios formed from the intersection of 1 year past earnings growth with only the high values (growth) and low values (value) of P/B, P/E or P/Sales. We only use 1 year past earnings growth in our analysis so as not to reduce our sample size significantly especially for markets that do not have extensive data coverage preceding 1993. This is also supported by earlier empirical results in Table 6.1 suggesting that both investors and analysts tend to overweight recent information and underweight prior information. The tables show the average annual returns for equally weighted portfolios and t-statistics testing whether the difference in returns in between the low and high 1 year past earnings growth portfolios are significant. Tables I, II and III in Appendix 1 summarise the results based on average annualised returns for market capitalization weighted portfolios.

The results in Tables 6.2, 6.3 and 6.4 do not suggest that extrapolation of past earnings growth is the source of extreme investor expectations in the Asian Equity Markets. According to the extrapolation hypothesis, if the market extrapolates the past and overreacts to previous earnings growth, the returns of stocks with low past earnings growth would have been significantly higher than the returns of stocks with high past earnings growth for both the value and growth portfolios. Instead our results show that the

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performance of more than 50% of the markets have their previous 'losers' underperforming temporary 'winners' within the same value or growth segments. For the markets with previous 'losers' (stocks with low past earnings growth) that do outperform previous 'winners' (stocks with high past earnings growth) within the same value or growth portfolio segments, the differences in returns are not statistically significant.

Table 6.2 - P/B Portfolios

Table 6.2 – Tests of Extrapolation on Equally Weighted Portfolios (Portfolios Formed on P/B and 1 Year Past Earnings Growth)

	GROWTH				VALUE			
Past Earnings Growth	Low	Mid	High	t-statistics	Low	Mid	High	t-statistics
Hong Kong	11%	8%	14%	-1.11	4%	12%	21%	-1.31
Indonesia	-16%	5%	-2%	-0.37	16%	-1%	9%	0.51
Japan	-11%	-7%	-8%	-0.77	-6%	-5%	-5%	-0.96
Korea	-7%	-5%	-1%	-1.56	-8%	-6%	-1%	-1.12
Malaysia	-6%	3%	-8%	0.23	5%	11%	9%	-0.56
Philippines	-8%	-5%	-13%	0.69	-9%	-15%	-2%	-0.36
Singapore	-6%	3%	9%	-4.89	4%	4%	7%	-0.37
Taiwan	-17%	5%	11%	-1.30	-5%	-2%	-10%	1.28
Thailand	-34%	-15%	-19%	-2.04	18%	3%	1%	1.06

Notes for Table 6.2

Table 6.2 shows the average annual returns for equally weighted portfolios formed jointly using 1 year past earnings growth and P/B ratio. We only report results from portfolios formed from the intersection of 1 year past earnings growth with only the high values (growth) and low values (value) of P/B ratio. The t-statistics show whether the difference in returns between low and high 1 year past earnings growth portfolios are significant.

Value Portfolios (Low P/B ratio)

Three portfolios with low past earnings growth earn higher average returns than similar value portfolios with high past earnings growth, but the differences in returns are not statistically significant.

Growth Portfolios (High P/B ratio)

Growth portfolios with low past earnings growth in Malaysia and Philippines outperform similar growth portfolios with high past earnings growth but the differences in returns are not statistically significant

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Table 6.3 - P/E Portfolios

Table 6.3 – Tests of Extrapolation on Equally Weighted Portfolios (Portfolios Formed on P/E and 1 Year Past Earnings Growth)

	GROWTH				VALUE			
Past Earnings Growth	**Low**	**Mid**	**High**	**t-statistics**	**Low**	**Mid**	**High**	**t-statistics**
Hong Kong	0%	6%	22%	-1.70	-4%	12%	16%	-3.67
Indonesia	-11%	-7%	-2%	-0.37	21%	-9%	12%	0.35
Japan	-9%	-10%	-8%	-0.40	-4%	-5%	-4%	0.13
Korea	1%	-6%	-17%	0.69	-10%	-1%	1%	-1.69
Malaysia	-5%	-2%	-15%	0.91	11%	10%	4%	0.45
Philippines	-12%	-23%	-21%	0.84	-5%	3%	-3%	-0.17
Singapore	0%	-4%	8%	-0.48	7%	3%	22%	-3.31
Taiwan	-12%	3%	-5%	-2.16	-5%	-3%	-1%	-0.30
Thailand	-19%	-14%	-10%	-1.67	15%	1%	-2%	0.90

Notes for Table 6.3

Table 6.3 shows the average annual returns for equally weighted portfolios formed jointly using 1 year past earnings growth and P/E ratio. We only report results from portfolios formed from the intersection of 1 year past earnings growth with only the high values (growth) and low values (value) of P/E ratio. The t-statistics show whether the difference in returns between low and high 1 year past earnings growth portfolios are significant.

Value Portfolios (Low P/E ratio)

Four portfolios with low past earnings growth outperform similar value portfolios with high past earnings growth but the differences in returns are not statistically significant.

Growth Portfolios (High P/E ratio)

Three portfolios with low past earnings growth earn higher average returns than similar growth portfolios with high past earnings growth, but the differences in returns are not statistically significant.

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Table 6.4 - P/Sales Portfolios

Table 6.4 – Tests of Extrapolation on Equally Weighted Portfolios (Portfolios Formed on P/Sales and 1 Year Past Earnings Growth)

	GROWTH				VALUE			
Past Earnings Growth	Low	Mid	High	t-statistics	Low	Mid	High	t-statistics
Hong Kong	5%	11%	11%	-0.89	-1%	13%	16%	-3.48
Indonesia	-23%	-6%	-10%	-1.09	8%	1%	17%	-0.34
Japan	-8%	-6%	-6%	-0.95	-8%	-6%	-6%	-0.80
Korea	-5%	-9%	-9%	1.33	0%	-5%	-1%	0.35
Malaysia	14%	11%	1%	1.43	22%	25%	24%	-0.31
Philippines	-11%	-16%	-7%	-0.19	0%	-17%	-21%	1.58
Singapore	-3%	-2%	6%	-0.98	2%	10%	18%	-2.11
Taiwan	-14%	-3%	0%	-0.81	0%	2%	1%	-0.18
Thailand	-17%	-12%	-12%	-0.96	17%	3%	15%	0.09

Notes for Table 6.4

Table 6.4 shows the average annual returns for equally weighted portfolios formed jointly using 1 year past earnings growth and P/Sales ratio. We only report results from portfolios formed from the intersection of 1 year past earnings growth with only the high values (growth) and low values (value) of P/Sales ratio. The t-statistics show whether the difference in returns between low and high 1 year past earnings growth portfolios are significant.

Value Portfolios (Low P/Sales ratio)

Three portfolios with low past earnings growth outperform similar value portfolios with high past earnings growth but the differences in returns are not statistically significant.

Growth Portfolios (High P/Sales ratio)

Growth portfolios with low past earnings growth in Korea and Malaysia outperform similar growth portfolios with high past earnings growth but not on statistically significant levels.

In conclusion, we observe that our results in Tables 6.2, 6.3 and 6.4 are not consistent with the view that the source of extreme expectations by investors is driven by extrapolation of past earnings growth in Asian Equity Markets as suggested by Lakonishok, Shleifer and Vishny (1994). The conclusions are also similar for market capitalization weighted portfolios presented in Tables I, II and III in Appendix 1 suggesting that the results are not influenced by size effect. Nonetheless, the results are consistent with the results by La Porta (1996) and Levis et al (2001) who found no systematic evidence that the value/growth effect arise from extrapolation of past growth.

Levis et al (2001) also showed that none of the previous 'losers' outperformed previous 'winners' in the UK Equity Markets at a statistically significant basis. However, their results showed that low past growth stocks did earn slightly higher returns than high past growth stocks within the low P/B segment but the difference was not statistically significant. Similarly, La Porta also showed that the returns of growth stocks that exhibit low past sales growth (temporary 'losers') were higher than those of temporary 'winners' but this was not the case for value stocks where the returns earned by stocks with low past sales growth (temporary 'losers') were lower than those of the temporary 'winners'. La Porta did not show the statistical significance of his results.

Our results show that less than 50% of the markets had statistically significant prior 'losers' outperforming prior 'winners' based on past earnings growth for both the value and growth segments. The results suggest that strategies which are contrarian to extrapolation of past earnings growth are not able to explain the difference in returns between value and growth stocks in the Asian markets.

In Section 6.6.3, we proceed to analyse whether extrapolation of historical price performance, another variable cited as a proxy measure for past performance, is able to explain the relative performance of value stocks against growth stocks in Asian Equity Markets.

6.6.3 Analysis of Results: Extrapolation of Historical Price Performance

DeBondt and Thaler (1985, 1987) have attributed the winner-loser effect based on historical price performance as the cause for overreaction due to extreme expectations.

In Section 6.6.1, we observe higher return performance of growth stocks relative to value stocks during the portfolio pre-formation period. We next determine whether extreme expectations caused by extrapolation of past price performance causes mis-pricing. Investors overprice past 'winners' expecting stocks that have performed well in the past to continue their stellar performance into the future whilst underpricing 'losers' that have done badly in the past based on expectations that they are not likely to show any price recovery in the future.

We follow exactly the same procedure as with past earnings growth in Section 6.6.2, but this time ranking stocks on the basis of their 1 year historical price performances. Unlike De Bondt et al (1985, 1987) and Levis et al (2001) who employed 3 and 5 years historical price performance in their analysis, we only use 1 year historical price performance in our analysis so as not to reduce our sample size significantly especially for markets that do not have extensive data coverage preceding 1993. This is supported by evidence based on 1 year past earnings growth in Table 6.1 which suggests that both investors and analysts tend to overweight recent information and underweight prior information (De Bondt et al (1985, 1987), Kahneman and Tversky (1982).

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Our sample data consists of stocks with available 12 months of return data prior to portfolio formation. This was unlike De Bondt et al that focused on stocks with 85 months of return data creating sample biases towards large, established firms. Our analysis covers a broad selection of both large and small capitalization stocks. To avoid the criticism that overreaction is caused by the small-firm effect we conduct our analysis for both equal and market capitalisation weighted portfolios.

Tables 6.5, 6.6 and 6.7 present the results of portfolios formed jointly using 1 year previous price performance and valuation ratios P/B, P/E and P/Sales respectively. We report the results from portfolios resulted from the intersection of 1 year historical price performance with only the high values (growth) and low values (value) of P/B, P/E or P/Sales.
The tables show the average annual returns for equally weighted portfolios and t-statistics testing whether the difference in returns between the low and high previous price performance portfolios are significant. Tables IV, V, and VI in Appendix 1 summarise the results based on average annual returns for market capitalization weighted portfolios.

In Tables 6.5, 6.6 and 6.7, we see that the post-formation differences in returns between 'winners' (high previous price performance) and 'losers' (low previous price performance), based on historical price performance, in any of the value and growth portfolios are not sufficient to explain the relative performance of value stocks against growth stocks.

According to the expectational error theory, if the market extrapolates the past and overreacts to historical price performance, the returns of stocks with low historical price performance would have been significantly higher than the returns of stocks with high historical price performance for both the value and growth portfolios. However, our results show that although the majority of previous 'losers' outperform previous 'winners' in terms of historical price performance within the same value or growth portfolio segments, the results of the t-statistics show that the differences in performance between prior 'losers' and 'winners' are not statistically significant.

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Table 6.5 - P/B Portfolios

Table 6.5 – Tests of Extrapolation on Equally Weighted Portfolios (Portfolios Formed on P/B and 1 Year Historical Price Performance)								
	GROWTH				VALUE			
Historical Price Performance	Low	Mid	High	t-statistics	Low	Mid	High	t-statistics
Hong Kong	14%	20%	11%	0.17	13%	9%	3%	1.55
Indonesia	26%	1%	-7%	1.08	14%	-6%	18%	-0.10
Japan	-9%	-7%	-9%	0.10	-6%	-5%	-6%	0.14
Korea	11%	-7%	-26%	2.90	-11%	-4%	-20%	0.27
Malaysia	3%	2%	-5%	0.45	5%	8%	8%	-0.45
Philippines	-8%	-2%	-11%	0.14	10%	-14%	-1%	0.23
Singapore	11%	0%	5%	0.57	9%	4%	-2%	0.95
Taiwan	8%	7%	1%	0.26	-3%	-5%	-14%	1.08
Thailand	-19%	-6%	-12%	-0.82	10%	11%	-3%	0.69

Notes for Table 6.5

Table 6.5 shows the average annual returns for equally weighted portfolios formed jointly using 1 year historical price performance and valuation ratio P/B. We only report results from portfolios formed from the intersection of 1 year historical price performance with only the high values (growth) and low values (value) of P/B ratio. The t-statistics show whether the difference in returns between low and high 1 year historical price performance portfolios are significant.

Value Portfolios (Low P/B ratio)

Six out of the nine portfolios with low historical price performance within the value segment earn higher average returns than similar value portfolios with high historical price performance. However, the results of the T-statistics point out that the differences in past performance between prior 'losers' and 'winners' are not statistically significant.

Growth Portfolios (High P/B ratio)

Seven out of nine portfolios of prior 'losers' outperform prior 'winners' within the growth segment, but the differences in returns are not statistically significant with the exception of Korea.

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Table 6.6 - P/E Portfolios

Table 6.6 – Tests of Extrapolation on Equally Weighted Portfolios (Portfolios Formed on P/E and 1 Year Historical Price Performance)

	GROWTH				VALUE			
Historical Price Performance	Low	Mid	High	t-statistics	Low	Mid	High	t-statistics
Hong Kong	10%	14%	4%	0.60	10%	18%	8%	0.45
Indonesia	1%	4%	-11%	0.34	4%	-10%	16%	-0.36
Japan	-11%	-8%	-7%	-0.67	-6%	-4%	-5%	-0.21
Korea	9%	-15%	-22%	0.61	-10%	3%	-2%	-0.52
Malaysia	-6%	0%	-10%	0.24	5%	8%	5%	-0.02
Philippines	-30%	-19%	-16%	-1.16	-7%	-6%	-8%	0.13
Singapore	10%	3%	-4%	0.81	14%	3%	9%	0.45
Taiwan	-6%	-11%	-9%	0.30	7%	0%	5%	0.37
Thailand	-14%	-9%	-18%	0.14	-1%	17%	-15%	0.45

Notes for Table 6.6

Table 6.6 shows the average annual returns for equally weighted portfolios formed jointly using 1 year historical price performance and valuation ratio P/E. We only report results from portfolios formed from the intersection of 1 year historical price performance with only the high values (growth) and low values (value) of P/E ratio. The t-statistics show whether the difference in returns between low and high 1 year historical price performance portfolios are significant.

Value Portfolios (Low P/E ratio)

Five portfolios of prior 'losers' within the value segment outperform prior 'winners', but the differences in returns are not statistically significant.

Growth Portfolios (High P/E ratio)

Six portfolios of prior 'losers' outperform prior 'winners' within the growth segment, but the differences in returns are not statistically different.

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Table 6.7 - P/Sales Portfolios

Table 6.7 – Tests of Extrapolation on Equally Weighted Portfolios (Portfolios Formed on P/Sales and 1 Year Historical Price Performance)

	GROWTH				VALUE			
Historical Price Performance	Low	Mid	High	t-statistics	Low	Mid	High	t-statistics
Hong Kong	12%	13%	5%	1.00	6%	15%	6%	0.00
Indonesia	-7%	-8%	-20%	0.60	8%	-8%	4%	0.09
Japan	-6%	-5%	-8%	0.41	-6%	-7%	-9%	0.80
Korea	-1%	-15%	-22%	1.45	-11%	-3%	-14%	0.07
Malaysia	10%	11%	10%	0.04	19%	20%	17%	0.07
Philippines	-24%	2%	-15%	-0.40	-7%	-21%	-9%	0.14
Singapore	4%	4%	-2%	0.67	6%	3%	3%	0.15
Taiwan	-5%	-5%	-9%	0.30	4%	0%	0%	0.44
Thailand	-12%	-17%	-4%	-0.21	5%	24%	-3%	0.27

Notes for Table 6.7

Table 6.7 shows the average annual returns for equally weighted portfolios formed jointly using 1 year historical price performance and valuation ratio P/Sales respectively. We only report results from portfolios formed from the intersection of 1 year historical price performance with only the high values (growth) and low values (value) of P/Sales ratio. The t-statistics show whether the difference in returns between low and high 1 year historical price performance portfolios are significant.

Value Portfolios (Low P/Sales ratio)

Eight out of the nine portfolios with low historical price performance within the Value segment earn higher average returns than similar value portfolios with high historical price performance. However, the results of the T-statistics point out that the differences in past performance between prior 'losers' and 'winners' are not statistically significant.

Growth Portfolios (High P/Sales ratio)

Six portfolios of prior 'losers' outperform past 'winners' within the growth segment, but the differences in returns are not statistically significant.

In conclusion, our results are not consistent with the view that overreaction caused by extreme expectations driven by extrapolation of historical price performance as suggested by DeBondt et al (1985, 1987) is able to explain the superior performance of value strategies in Asian Equity Markets. The conclusions are also similar for market capitalization weighted portfolios presented in Tables IV, V and VI in Appendix 1 suggesting that the results are not influenced by size effect.

Our results are consistent with the results of the study done by Levis, et al (2001) for the UK Equity Market. They showed that in five out of six cases, past 'winners' based on historical price performance underperform 'losers'. Similar to our results, the results of the t-statistics by Levis et al point out that the difference in performance between prior 'losers' and 'winners' is by no means significant at any conventional significant level. Both results do not agree with the extrapolation hypothesis where past 'losers' become 'winners' on a statistically significant level post-portfolio formation.

6.6.4 Conclusion

This chapter tests whether extreme expectations caused by extrapolating past performance explain the superior performance of value strategies. We make use of the following measures to determine past performance:

- Past growth in earnings; and
- Historical price performance

Section 6.6.1 shows empirical evidence that value stocks formed on the basis of P/B ratio are prior 'losers' that become new 'winners' in the years after portfolio formation while growth stocks are prior 'winners' that become new 'losers' after portfolio formation. The reversal of patterns in price performance and earnings growth for both value and growth portfolios is consistent with the extrapolation hypothesis of Lakonishok et al (1994).

Lakonishok et al argued that value (growth) stocks are characterised by low (high) past growth and expected low (high) future growth in sales, earnings and cash flows. These characteristics create excessive optimism for growth stocks and pessimism for value stocks which is subsequently reflected in the stock prices. This causes certain degree of mispricing which makes value stocks to be underpriced and growth stocks overpriced. According to Lakonishok et al, the mean reversion of the growth characteristics explains the difference in performance between value and growth stocks where past 'losers' outperform past 'winners'.

We next determine in Sections 6.6.2 and 6.6.3 whether extrapolation of past performance can explain the superior performance of value strategies.

Section 6.6.2 analyses the returns of portfolios formed jointly using 1 year past earnings growth and valuation ratios P/B, P/E and P/Sales respectively. Our conclusions are based on results from portfolios formed from the intersection of 1 year past earnings growth with only the high values (growth) and low values (value) of P/B, P/E or P/Sales. Our results show that less than 50% of the markets had statistically significant prior 'losers' outperforming prior 'winners' based on past earnings growth for both the value and grwoth segments. If the market extrapolates the past and overreacts to previous earnings growth, then according to the expectational error theory, the returns of low earnings growth stocks would have been significantly higher than the returns of high earnings growth stocks for both the value and growth portfolios.

Our results in Section 6.6.2 are not consistent with the view that the source of extreme expectations by investors is driven by extrapolation of past earnings growth as suggested by Lakonishok et al (1994). Therefore, the results suggest that strategies which are contrarian to extrapolation of past earnings growth are not able to explain the difference in returns between value and growth stocks in the Asian Equity Markets.

We therefore proceed to analyse in Section 6.6.3 whether historical price performance, another variable cited as proxy measure for past performance, is able to explain the superior performance of value strategies. We analyse the returns of portfolios formed jointly using 1 year historical price performances and valuation ratios P/B, P/E and P/Sales respectively. We follow exactly the same procedure as with past earnings growth in Section 6.6.2, but this time ranking stocks on the basis of their 1 year historical price performances.

The results in Section 6.6.3 show that the majority of previous 'losers' outperform previous 'winners' in terms of historical price performance within the same value or growth portfolio segments. However, the results of the t-statistics show that the differences in performance between prior 'losers' and 'winners' are not significant. Our results in Section 6.6.3 are not consistent with the view that overreaction caused by extrapolation of historical price performance as suggested by DeBondt et al (1985, 1987) is able to explain the superior performance of value strategies in Asian Equity Markets.

In conclusion, our results show that although value stocks based on valuation ratios (P/B, P/E, P/Sales) have low relative past earnings growth and price performance; the results do not provide statistically significant evidence that mispricing is caused by investors influenced by past performance. There is no statistically significant evidence suggesting that extreme expectations driven by extrapolation of past performance such as past earnings growth as suggested by Lakonishok et al (1994) or historical price performance as suggested by DeBondt et al (1985, 1987) is able to explain the superior performance of value strategies in Asian Equity Markets. The conclusions are also similar for market capitalization weighted portfolios presented in Appendix 1 suggesting that the results are not influenced by size effect.

Chapter 6 – Role of Expectational Error due to Extrapolation of Past Performance on the Performance of Value and Growth Stocks

Whilst extrapolation of past performance may not be able to explain the value/growth effect in the Asian Equity Markets, there may be other institutional and behavioural factors which affect the performance of Asian Equity Markets such as:

- The performance of Asian Markets is driven by foreign portfolio flows which affect the smaller capitalization markets to a greater degree, hence breaking any relationship between the variable and returns

- Asian Equity Markets are driven by sentiment where investors ignore basic fundamentals and the concept of mean-reversion of growth rates. Investors tend to be driven instead by rumours and analysts forecasts despite the fact that they suffer from systematic biases; and

- Pension Funds in the Asian markets are still relatively under-developed. Hence these markets are subject to the behavioural patterns of foreign investors and domestic retail investors. The domestic retail investors tend to have short term investment horizon and generally tend to be driven by momentum growth stocks.

These other institutional and behavioural factors may provide testable alternative hypotheses which are examined in Chapter 7.

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APPENDIX 1

Table I – Tests of Extrapolation on Market Capitalisation Weighted Portfolios (Portfolios Formed on P/B and 1 Year Past Earnings Growth)

	GROWTH				VALUE			
Past Earnings Growth	Low	Mid	High	t-statistics	Low	Mid	High	t-statistics
Hong Kong	7%	15%	15%	-0.82	0%	15%	14%	-2.07
Indonesia	-16%	5%	10%	-0.37	4%	-13%	0%	0.14
Japan	-5%	-4%	-6%	0.20	-4%	-1%	-2%	-0.86
Korea	-10%	2%	11%	-2.36	-11%	-8%	-2%	-0.59
Malaysia	-2%	0%	-7%	0.41	6%	12%	10%	-0.22
Philippines	-5%	-5%	-8%	0.34	-7%	-10%	-11%	0.63
Singapore	-12%	6%	4%	-1.46	-3%	8%	0%	-0.35
Taiwan	-9%	9%	15%	-0.92	-1%	5%	-7%	1.94
Thailand	-33%	-16%	-10%	-2.87	-4%	-4%	-2%	-0.13

Table II – Tests of Extrapolation on Market Capitalisation Weighted Portfolios (Portfolios Formed on P/E and 1 Year Past Earnings Growth)

	GROWTH				VALUE			
Past Earnings Growth	Low	Mid	High	t-statistics	Low	Mid	High	t-statistics
Hong Kong	9%	14%	22%	-0.69	-2%	11%	20%	-3.36
Indonesia	-26%	-1%	19%	-3.24	22%	-18%	10%	0.80
Japan	-5%	-7%	-6%	0.31	2%	1%	-1%	0.43
Korea	-6%	-3%	-10%	0.30	-18%	-5%	8%	-2.37
Malaysia	-4%	-1%	-17%	0.94	19%	12%	-2%	0.66
Philippines	-3%	-11%	-10%	0.87	-7%	14%	-14%	1.09
Singapore	-5%	-2%	4%	-0.63	5%	8%	15%	-1.93
Taiwan	-7%	8%	-2%	-0.38	-9%	-3%	5%	-0.67
Thailand	-28%	-13%	-3%	-3.13	6%	-5%	-14%	1.20

Table III – Tests of Extrapolation on Market Capitalisation Weighted Portfolios (Portfolios Formed on P/Sales and 1 Year Past Earnings Growth)

	GROWTH				VALUE			
Past Earnings Growth	Low	Mid	High	t-statistics	Low	Mid	High	t-statistics
Hong Kong	7%	18%	15%	-0.99	5%	13%	17%	-1.29
Indonesia	-28%	0%	6%	-2.48	-1%	-7%	7%	-0.64
Japan	-4%	-2%	-5%	0.28	-5%	-4%	-4%	-0.50
Korea	-9%	6%	5%	-1.37	0%	-5%	-8%	3.71
Malaysia	9%	3%	-3%	1.46	22%	25%	17%	0.32
Philippines	-6%	-8%	-10%	0.18	5%	-11%	-32%	2.14
Singapore	-4%	5%	3%	-0.67	0%	10%	5%	-10.67
Taiwan	-5%	4%	7%	-0.50	-1%	3%	0%	-0.06
Thailand	-19%	-17%	-12%	-0.43	4%	-12%	8%	-0.19

Notes for Tables I, II and III

Tables I, II and III show the average annual returns for market capitalisation weighted portfolios formed jointly using 1 year past earnings growth and valuation ratios P/B, P/E or P/Sales respectively. We only report results from portfolios formed from the intersection of 1 year past earnings growth with only the high values (growth) and low values (value) of P/B, P/E or P/Sales ratio. The t-statistics show whether the difference in returns between low and high 1 year past earnings growth portfolios are significant.

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APPENDIX 1 continued

Table IV – Tests of Extrapolation on Market Capitalisation Weighted Portfolios (Portfolios Formed on P/B and 1 Year Historical Price Performance)

	GROWTH				VALUE			
Historical Price Performance	Low	Mid	High	t-statistics	Low	Mid	High	t-statistics
Hong Kong	14%	23%	12%	0.19	19%	8%	0%	3.74
Indonesia	25%	12%	-9%	1.21	5%	-12%	12%	-0.19
Japan	-7%	-4%	-7%	0.01	0%	-3%	-5%	1.14
Korea	6%	-11%	-33%	1.75	-23%	-6%	-31%	0.26
Malaysia	6%	3%	-10%	1.03	6%	13%	5%	0.07
Philippines	-9%	-3%	-8%	-0.10	10%	-10%	-5%	0.33
Singapore	16%	-2%	4%	0.77	5%	5%	-5%	1.36
Taiwan	8%	6%	1%	0.26	2%	-2%	-14%	1.32
Thailand	-22%	-5%	-7%	-1.36	-3%	5%	6%	-0.62

Table V – Tests of Extrapolation on Market Capitalisation Weighted Portfolios (Portfolios Formed on P/E and 1 Year Historical Price Performance)

	GROWTH				VALUE			
Historical Price Performance	Low	Mid	High	t-statistics	Low	Mid	High	t-statistics
Hong Kong	13%	22%	7%	0.60	11%	11%	11%	-0.10
Indonesia	-4%	16%	-9%	0.15	-1%	-5%	10%	-0.40
Japan	7%	-5%	-6%	-0.22	-3%	2%	3%	-1.15
Korea	-8%	-18%	-19%	0.33	-18%	0%	-7%	-0.54
Malaysia	-3%	3%	-13%	0.98	9%	7%	2%	0.36
Philippines	-28%	-5%	-14%	-1.41	-5%	-6%	-11%	0.69
Singapore	5%	4%	-3%	0.60	20%	10%	2%	1.63
Taiwan	-11%	-12%	-3%	-0.67	14%	-1%	14%	0.01
Thailand	-14%	-10%	-13%	-0.02	-16%	0%	-16%	-0.01

Table VI – Tests of Extrapolation on Market Capitalisation Weighted Portfolios (Portfolios Formed on P/Sales and 1 Year Historical Price Performance)

	GROWTH				VALUE			
Historical Price Performance	Low	Mid	High	t-statistics	Low	Mid	High	t-statistics
Hong Kong	14%	21%	9%	0.80	1%	29%	4%	-0.23
Indonesia	-3%	1%	-17%	0.60	-10%	-15%	-6%	-0.16
Japan	-3%	-3%	-6%	0.43	-2%	-5%	-6%	1.51
Korea	-6%	-20%	-29%	1.07	-20%	-3%	-13%	-0.18
Malaysia	4%	7%	1%	0.29	19%	25%	11%	0.26
Philippines	-23%	-4%	-16%	-0.70	-7%	-11%	-13%	0.33
Singapore	6%	8%	-4%	1.16	4%	1%	-1%	0.43
Taiwan	6%	2%	-4%	0.41	8%	0%	-3%	1.24
Thailand	-17%	-18%	2%	-0.47	-13%	16%	0%	-0.48

Notes for Tables IV, V and VI

Tables IV, V and VI show the average annual returns for market capitalisation weighted portfolios formed jointly using 1 year historical price performance and valuation ratios P/B, P/E or P/Sales respectively. We only report results from portfolios formed from the intersection of 1 historical price performance with only the high values (growth) and low values (value) of P/B, P/E or P/Sales ratio. The t-statistics show whether the difference in returns between low and high 1 year historical price performance portfolios are significant.

Chapter 6 – Role of Expectational Error due to Extrapolation of Past Performance on the Performance of Value and Growth Stocks

Chapter 7
Role of Investor Sentiment on the Performance of Value and Growth Stocks

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7.1 Objective

This chapter examines the role of investor behaviour on the performance of value and growth stocks in Asian Equity Markets. We use two measures as proxy for investor behaviour in Asian Equity Markets:

- Net foreign portfolio flows into each country (proxied by US net portfolio flows); and

- Naive reliance on analysts' forecasts reflected by analysts' forecast errors

We investigate the impact of US net portfolio flows and analysts' forecast errors independently as well as jointly on the performance of value and growth stocks in Asian Equity Markets.

7.2 Motivation

Our study in Chapter 6 demonstrates that extrapolation of past performance, was not able to explain the difference in returns between value and growth stocks. There may be other behavioural factors which may provide testable alternative hypotheses in explaining the differences in performance between value and growth stocks.

We therefore examine the impact of investor behaviour measured by net foreign portfolio flows and analysts' forecast errors on the performance of value and growth stocks.

Investor behaviour is difficult to measure but many practitioners including academics such as Bennett and Sias (2001), Fisher and Statman (2000), Levis and Thomas (1999) and Warther (1995) appear to consider fund flows as a measure of investor sentiment and believe that investor sentiment affects returns as summarised below:

We highlight three theories discussed in Chapter 2 that account for the link between fund flows and stock returns:

i) Feedback Trader Hypothesis

Feedback Trader Hypothesis predicts that fund flows lag returns. According to Schartstein et al (1990) and McQueen et al (1996), this is because investors direct their investments into markets or mutual funds with good past performance and away from markets or mutual funds with poor past performance i.e. high past returns turn investors bullish.

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II) Information Revelation by Fund Flows

Warther suggested that information revelation as a possible explanation for a positive relationship between fund flows and subsequent returns. If investors possess information or merely trade in the same direction as another group of investors who possess information, stock prices will move in the same direction as the fund flows affecting subsequent returns in the same direction.

III) Price Pressure Hypothesis

Price Pressure Hypothesis predicts that fund flows exert price pressures on stock returns. Harris et al (1986), Shleifer (1986) and Warther (1995) showed evidence that returns are mean reverting and therefore there exists a negative relationship between fund flows and subsequent returns.

The above empirical studies provide support for the use of portfolio flows as a proxy for investor behaviour in our study. We make use of net foreign portfolio flows into each market proxied by US net portfolio flows in our analysis to determine the relationship between portfolio flows and stock returns.

A large number of Asian Equity markets in our sample universe tend to be dominated by foreign portfolio flows because their domestic institutional and retail markets are still relatively small. Many of these markets have relatively immature domestic investment frameworks. The domestic equity markets in each of these countries tend to be skewed towards retail investors. The pension funds are traditionally state managed in most of Asia and have a bias towards ownership of bonds rather than equities. Thus, these markets are subject to the behavioural patterns of international investors defined by foreign portfolio flows.

We use total US net portfolio flows as a proxy for foreign portfolio flows into each market. We highlight that Bekaert and Harvey (2000, 2003) and Bekaert, Harvey and Lumsdaine (2002) made use of similar data as proxy for foreign portfolio flows in their analysis on the role of portfolio flows on emerging stock market returns.The reason for using US net portfolio flows is that not every local stock exchange reports data on foreign portfolio flows and the US is one of the few countries that has detailed measurements for sixty-five countries. Reported data, where available from local stock exchanges, on total net foreign portfolio flows are usually distorted by dividend reinvestments and foreign exchange volatility, especially for the smaller Asian markets. US net portfolio flows published by the US Federal Reserve Bank represents total direct flows at source and is not distorted by foreign exchange movements or dividend reinvestments. Besides, foreign portfolio flows are usually dominated by portfolio flows from US based retail and institutional investors. Preliminary studies show that US net portfolio flows account for 35% of aggregate net foreign flows into Indonesia, Philippines and Taiwan and more than 50% of aggregate net foreign flows into Korea during the period 1992-2000, as reported by the local stock exchanges respectively. However, we appreciate that US portfolio flows may not provide the complete measure of foreign portfolio flows into each market as US net portfolio flows may dominate foreign portfolio flows into some markets and less so in other markets.

We also make use of an additional aspect of behavioural finance which is based on the naïve reliance of investors on analysts' forecasts of expectations of growth for stocks to explain the difference in returns between value and growth stcoks.
Academic research has shown that investors make systematic errors on stock pricing driven by reliance on analysts' earnings forecasts. Research shows that stock prices incorporate analysts' forecasts of earnings growth. The investor realization of actual earnings per share figures following excessive reliance on optimism of analysts for growth stocks and pessimism for value stocks creates positive surprises for value stocks and negative surprises for growth stocks. This results in upside price movement for value stocks and downward price movement for growth stocks.

Our study therefore examines the impact of investor behavior measured by net foreign portfolio flows and analysts' forecast errors independently and jointly on the performance of value and growth stocks.

7.3 Hypotheses

Hypothesis I: The relationship between net foreign portfolio flows and performance of stocks explains the value/growth effect.

The 'Feedback Trader' and 'Price Pressure' Hypotheses provide a case that portfolio flows - lagged and contemporaneous, exhibit different relationships with returns for value and growth stocks. Feedback Trader Hypothesis argues that the persistence in portfolio flows' drives up stock prices to valuation levels which are not justified by their underlying fundamentals. This is because investors direct their investments into markets or mutual funds with good past performance and away from markets or mutual funds with poor past performance i.e. high past returns turn investors bullish. Feedback Trader Hypothesis implies that positive contemporaneous flows drive stock price increases for growth stocks and negative flows drive stock price decreases for value stocks. Once the Price Pressure or investor sentiment 'wave' has passed, stock returns exhibit reversals to levels in line with fundamental value of underlying stocks. Excessive lagged positive portfolio flows and lagged negative portfolio flows cause mis-pricing in the equity markets which make 'Growth' stocks overpriced and 'Value' stocks underpriced. Price Pressure predicts that returns are mean-reverting and strategies that exploit the mis-pricing in stock returns produce abnormal returns which may explain the superior returns of underpriced and ignored 'value' stocks. We provide an update and some new evidence on the impact of both contemporaneous and lagged flows on the performance of value and growth stocks.

Hypothesis II: Positive and negative analysts' forecast errors have asymmetrical impact on the performance of value and growth stocks consistent with the expectational error theory. This explains the differences in performance between value and growth stocks resulting from analysts' forecast errors.

Some academic studies such as La Porta (1996), Dechow and Sloan (1997), Levis and Liodakis (2001) show that overreaction to the equity markets is caused by reliance on analysts' earnings forecasts because they contain systematic biases which are either overoptimistic (for growth stocks) or overpessimistic (for value stocks). Overreaction causes mispricing in the equity markets which make growth stocks overpriced and value stocks underpriced.

According to the expectational error theory, the actual realisation of earnings following excessive optimism of analysts for growth stocks and pessimism for value stocks creates positive surprises for value stocks pushing their prices up and vice versa for growth stocks.

This explains the subsequent differences in returns between value and growth stocks. The expectational error theory implies that positive and negative surprises have asymmetrical effects on returns of value and growth portfolios. A positive surprise will have a disproportionately positive impact on the returns of value stocks compared to the negligible impact on growth stocks. On the other hand, a negative surprise will have a negative impact on the returns of growth stocks while having only a minor effect on the returns of value stocks. The market is less surprised by the negative news for value stocks than for growth stocks.

Our study determines whether surprises are systematically more positive for value stocks and systematically more negative for growth stocks to be able to explain the superior long term performance of value strategies over growth strategies consistent with the expectational error theory.

Hypothesis III: A combination of analysts' forecast errors (positive and negative) and portfolio flows are key determinants in explaining the differences in performance between value and growth stocks.

It is difficult to isolate a single behavioural factor as the only solution behind the value-growth spread. These behavioural factors may have joint roles in explaining the reasons behind the superior returns of value stocks. For example, Stock A with positive forecast errors gets noticed by the market affecting price returns of Stock A. This indicates that both forecast errors and portfolio flows jointly affect the returns of Stock A.

Hence, there is a case that a combination of portfolio flows and analysts' forecast errors may be able to better explain the differences in performance of value and growth stocks (rather than isolated behavioural factors such as portfolio flows or analysts' forecast errors on its own).

7.4 Methodology for testing Hypotheses and Regression Methods Used

7.4.1 Methodology for Testing Hypotheses

We summarise the methodology for testing the various Hypotheses as follows:

7.4.1.1 Hypotheses I: Role of Net Foreign Portfolio Flows

To determine the role of investor behaviour measured by US net portfolio flows within a country on the performance of value and growth stocks, time series regressions are employed in each country across its sample period.The regressions used in Hypothesis I are tested using different time-series of portfolio flows as follows:

Model I uses contemporaneous and lagged flows (first and second lags).

Model II uses contemporaneous expected and unexpected flows. Large autocorrelations in portfolio flows suggest that they are highly predictable. Thus the predictable component is separated from the unpredictable to see if the value and growth portfolios react differently to the two.

The estimation of the expected and unexpected contemporaneous portfolio flows and the regression methods are explained in greater detail in this section.

To compute the returns of value and growth portfolios for the regressions against portfolio flows, value and growth portfolios need to be constructed:

At the end of each June over the sample period, 3 fractile portfolios are formed in ascending order based on P/B ratio. Portfolios are formed on an equal weighted basis. Value portfolio refers to group of stocks in the lowest fractile while growth portfolio refers to stocks in the highest fractile. Portfolios are rebalanced at the end of each June and returns are computed for each month beginning from July of each year until end of June the following year. The process is replicated across each country in this study. We make sure that only companies with positive P/B ratios are used in the data set.

7.4.1.2 Hypothesis II: Role of Analysts' Forecast Errors

We extend the analysis of Dreman and Berry (1995) to determine the role of investor behaviour measured by analysts' forecast errors on the performance of value and growth stocks. A multivariate regression analysis is employed to assess the impact of positive and negative forecast errors on the returns of value and growth stocks. The returns of value and growth portfolios (as defined by P/B) that exhibit positive and negative forecast errors are regressed against their respective forecast errors on a time series - cross-sectional (country) basis. We run two different sets of regressions; one for the portfolio of value and growth stocks with positive forecast errors and one for the portfolio of value and growth stocks that exhibit negative forecast errors.

We apply the following portfolio formation process below to compute the returns of Value and Growth portfolios of stocks that exhibit positive and negative forecast errors for the regressions using forecast errors as independent variables.

At the end of each June over the sample period, 3 fractile portfolios are formed in ascending order based on P/B ratio for the universe of stocks that exhibit positive forecast errors. Portfolios are formed on an equal weighted basis. Value portfolio with positive forecast errors refers to group of stocks in the lowest fractile while growth portfolio with positive forecast errors refers to stocks in the highest fractile. Portfolios are rebalanced at the end of each June and returns are computed annually beginning from July of each year until end of June the following year. The process is replicated across each country in this study. The same procedure is applied for a universe of stocks with negative forecast errors to determine value and growth portfolios of stocks that exhibit negative forecast errors. We make sure that only companies with positive P/B ratios are used in the data set.

The regressions make use of Forecast Errors I that is defined as forecast error as a percentage over actual EPS.

7.4.2 Regression Methods Used for Testing Hypotheses

We summarise the regressions methods used for testing the various Hypotheses as follows:

7.4.2.1 Hypotheses I: Role of Net Foreign Portfolio Flows

Time Series Regressions are carried out on the performance of value and growth portfolios of securities in each country against each set of independent variables defined in Models I and II as follows in Example I:

Example I

Regression (Model I) - contemporaneous and lagged flows

$$\text{Portfolio Return}_t = c_t + \text{Portfolio Flows}_t + \text{Portfolio Flows}_{t-1} + \text{Portfolio Flows}_{t-2}$$

Regression (Model II) - contemporaneous expected and unexpected flows

$$\text{Portfolio Return}_t = c_t + \text{Expected Portfolio Flows}_t + \text{Unexpected Portfolio Flows}_t$$

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In order to be able to conduct Regression (Model II), expected and unexpected contemporaneous portfolio flows need to be estimated. Time series regressions are carried out on contemporaneous portfolio flows against lagged portfolio flows in each country to determine both expected and unexpected contemporaneous portfolio flows as described below:

To Determine Expected and Unexpected Contemporaneous Portfolio Flows for Regression Model (II)

We use AR(1) model to estimate expected and unexpected portfolio flows in each country with certain exceptions; for Hong Kong, Malaysia and Thailand we use AR(3), for Indonesia and Korea we use AR(2). The first lag coefficient is positive and significant for Hong Kong, Japan, Malaysia, Singapore and Taiwan. The second lag coefficient is positive and significant for Indonesia, Korea, Thailand and marginally significant for Hong Kong. We make use of Schwarz Criterion as a guide to selecting the choice of the AR (m) models. Smaller values of Schwarz Criterion are preferred. A summary of the T-statistics of the coefficients on the lagged fund flows as well as Schwarz Criterion values are shown in Table 7.1.

We make use of the coefficients from these AR models to estimate a value for the expected fund flows for the following month for each country. The residual values of the AR regression represent the series for unexpected fund flows.

Tests for autocorrelation of residuals using the generalized LaGrange multiplier test of Godfrey and Breusch (LM Test) are reported as well in Table 7.1. The LM Test is used to test for higher order of autoregressive moving average errors (ARMA) errors and is applicable whether or not there are lagged dependent variables. The null hypothesis of the LM Test is that there is no serial correlation up to lag order (m) where m is a pre-specified integer. The LM Test statistic is asymptotically distributed as a Chi-square (m).

In all cases, we accept the null hypothesis that there is no serial correlation of the residuals up to lag order (m), as defined by AR (m) models in each country. We then conduct time series regressions on the performance of value and growth portfolios of securities in each country against the estimated expected and unexpected contemporaneous fund flows, as defined in Regression (Model II). This approach is similar to that used by Warther (1995).

Table 7.1 – Results of Regressions (T-statistics) on Contemporaneous Fund Flows against Lagged Fund Flows

Model AR(m)	Hong Kong	Indonesia	Japan	Korea	Malaysia	Philippines	Singapore	Taiwan	Thailand
AR(1)	3.48	0.97	7.27	0.43	3.50	1.33	4.55	3.05	0.57
AR(2)	-1.90	2.85		3.02	0.66				1.99
AR(3)	3.18				-1.93				-1.69
R^2 (adjusted)	0.12	0.08	0.28	0.07	0.14	0.01	0.13	0.09	0.04
Schwarz Criterion	-8.25	-8.40	-11.29	-8.77	-10.95	-8.96	-7.87	-11.22	-10.84
LM Test (p value)	0.53	0.45	0.94	0.09	0.64	0.39	0.39	0.05	0.61

Notes for Table 7.1

AR(1) -Japan, Philippines, Singapore and Taiwan

AR(2) -Indonesia, Korea

AR(3) - Hong Kong, Malaysia and Thailand

7.4.2.2 Hypotheses II: Role of Analysts' Forecast Errors

The returns of value and growth portfolios (as defined by P/B and signs of forecast errors) are regressed against the respective forecast errors on a time series - cross-sectional (country) basis. We use the Seemingly Unrelated Regressions (SUR) as its estimation method accounts for heteroskedasticity and contemporaneous correlation in the errors across time and countries. We run two different sets of regressions; one for the portfolio of value and growth stocks with positive forecast errors and one for the portfolio of value and growth stocks that exhibit negative forecast errors.

Example II

Regression using portfolios of value and growth stocks with Positive Forecast Errors

$$\text{Portfolio Return}_{x,t} = c_t + \text{Positive Forecast Errors } I_{x,t}$$

Regression using portfolios of Value and Growth stocks with Negative Forecast Errors

$$\text{Portfolio Return}_{x,t} = c_t + \text{Negative Forecast Errors } I_{x,t}$$

where;

x = country

t = annual time periods

Forecast Errors I = average of Forecast Errors I. Forecast Errors I is defined as forecast error as a percentage of actual EPS; the average forecast errors are computed annually for the purpose of these regressions

7.4.2.3 Hypotheses III: Joint Role of Net Foreign Portfolio Flows and Analysts' Forecast Errors

We further extend the analysis in Section 7.4.2.2 above to examine the joint role of US net portfolio flows and analysts' forecast errors on the performance of value and growth stocks. Similar SUR regressions are run as shown above in Example II but this time, the independent variable Forecast Errors I is used in combination with Expected and Unexpected Contemporaneous Portfolio Flows as shown below:

Example III

Regression using portfolios of value and growth stocks with Positive Forecast Errors

$$\text{Portfolio Return}_{x,t} = c_t + \text{Positive Forecast Errors I}_{x,t} + \text{Expected Portfolio Flows}_{x,t} + \text{Unexpected Portfolio Flows}_{x,t}$$

Regression using portfolios of Value and Growth stocks with Negative Forecast Errors

$$\text{Portfolio Return}_{x,t} = c_t + \text{Negative Forecast Errors I}_{x,t} + \text{Expected Portfolio Flows}_{x,t} + \text{Unexpected Portfolio Flows}_{x,t}$$

where;

x = country

t = annual time periods

Forecast Errors I = average forecast errors defined as a percentage of actual EPS; the average forecast errors are computed annually for the purpose of the regressions

In order to be able to conduct the above regressions in Hypothesis III, expected and unexpected contemporaneous portfolio flows need to be estimated. The regressions used as shown in Example III above are on an annual time series – cross-section basis.
Thus, we are not able to use the data on expected and unexpected flows computed on a monthly basis as used in Hypothesis I (see Table 7.1 in Section 7.4.2.1). If we were to make use of AR (1), (2) or (3) models (as used in Hypothesis I) on annual data to compute expected portfolio flows; it would mean that we would lose a significant amount of data in our regressions. Therefore, we calculate the cumulative annual total US net portfolio flows into each market. We define the expected flows as the cumulative total portfolio flows for the previous year. The difference between actual flows and the expected flows provides a measure of the unexpected portfolio flows.

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7.5 Description of Company Specific Variables

Earnings (EPS) Forecasts

We make use of IBES Consensus Median fiscal year 1 (FY1) earnings per share (EPS) forecasts. Stock analysts contribute their earnings forecasts for the next fiscal year (FY1) which are compiled by service provider IBES to determine the IBES Consensus Median FY1 eps forecasts. The forecasts refer to earnings per share before extraordinary items

Forecast errors

$$\text{Forecast Errors I} = \frac{\text{Actual EPS} - \text{Median Forecast EPS}}{[\text{Actual EPS}]}$$

$$\text{Forecast Errors II} = \frac{\text{Actual EPS} - \text{Median Forecast EPS}}{[\text{Median Forecast EPS}]}$$

$$\text{Forecast Errors III} = \frac{\text{Actual EPS} - \text{Median Forecast EPS}}{[\text{Standard Deviation of Analysts' Forecasts of EPS}]}$$

$$\text{Forecast Errors IV} = \frac{\text{Actual EPS} - \text{Median Forecast EPS}}{[\text{Share Price}]}$$

We have observed from EPS forecast data (provided by IBES) that some securities are only covered by less than 3 analysts. EPS forecasts for other securities are covered by 3 or more analysts. There is insufficient academic evidence to prove that EPS consensus forecasts of companies driven by 3 or more analysts is superior to a consensus forecast driven by only 1 analyst. This is attributed to the 'herd behaviour' of analysts as 2 or more analysts could be followers of the EPS forecast of a company made by 1 analyst in the group. This is similar to a consensus forecast made by only one analyst.

As cited by Dreman and Berry (1995), analysts may be drawn to consensus opinion either openly or unknowingly by the safety of the group. Further an estimate that is far off from the consensus might pose career dangers, whereas an estimate near the group may provide the analyst with a much higher degree of safety, regardless of how inaccurate it may prove to be.

We make use of data that consists of all companies that have an EPS consensus forecast produced at least by 1 analyst to increase the breadth of companies with large as well as small capitalization stocks in our sample universe. Most studies that use the above definitions of forecast errors require at least 3-5 analysts to produce forecasts for the firms' EPS. We found that we are losing too many observations especially from small companies in both the smaller and larger Asian markets when we impose the restriction of only including companies with forecasts EPS provided by 3-5 analysts. For example, the aggregate number of companies in the value portfolios would have reduced by 60% and the aggregate number of companies in the growth portfolios would have reduced by 40%, if we imposed restrictions of only including companies with forecasts provided by 3-5 analysts. The data is also trimmed to eliminate suspect data and outliers. All companies with forecast errors below the 5th percentile value and above the 95th percentile value are removed from our sample.

7.6 Data Sources

US Net Portfolio Flows

We use total US net portfolio flows as a proxy to foreign portfolio flows into each market. We highlight that Bekaert et al (2000, 2002, 2003) made use of similar data as a proxy for net foreign flows in their research. The reason for using US net portfolio flows is that not every local stock exchange reports data on foreign portfolio flows and the US is one of the few countries that has detailed monthly measurements for sixty-five countries.
Reported data, where available from local stock exchanges, on total net foreign portfolio flows are usually distorted by dividend reinvestments and foreign exchange volatility, especially for the smaller Asian markets. US net portfolio flows published by the US Federal Reserve Bank ('Fed') represents total flows at source and is not distorted by foreign exchange movements.

The US Federal Reserve Bank ('Fed') publishes monthly data on total US net portfolio flows in overseas countries. Total US net portfolio flows is defined as the difference between gross stock sales (of foreign securities) by foreigners to US residents and gross stock purchases (of foreign securities) by foreigners from US residents. The data excludes dividend reinvestments.

Following Warther (1995), the monthly US portfolio flows are normalized by dividing them by the market capitalization of the MSCI Index in each country expressed in USD billion, at the start of each month. MSCI Indices are commonly used by foreign investors as the benchmark representation of the underlying markets.

We make use of different time-series of portfolio flows in this chapter as follows:

Model I uses contemporaneous and lagged flows in this chapter as follows:

Model II uses contemporaneous expected and unexpected flows.

We define the different time-series of portfolio flows as follows:

Contemporaneous fund flows
Fund Flows in month t

First Lag of Fund Flows
Fund Flows in month t-1

Second Lag of Fund Flows
Fund Flows in month t-2

Change in Fund Flows (referred as D(Fund Flows)) (see Appendix 1 Table I)
Difference in Fund Flows between month t and t-1
(Similar definition used for Change in Contemporaneous Fund Flows and Change in First/Second Lags of Fund Flows)

7.7 Do Portfolio Flows and Analysts' Forecast Errors Explain the Value/Growth Effect in Asian Equity Markets?

This section examines the results of regressions using total US net portfolio flows in each country as well as analysts' forecast errors (as a measure for investor sentiment) against the performance of value and growth stocks in Asian Markets. The results are documented in the following sections:

Section 7.7.1 examines the relationship between the performance of value and growth stocks and US net portfolio flows (contemporaneous as well as lagged flows).
Section 7.7.2 examines the relationship between the performance of value and growth stocks and analysts' forecasts errors. We further extend the analysis to examine the joint role of US net portfolio flows and analysts' forecast errors on the performance of value and growth stocks. We document our conclusions in Section 7.7.3.

7.7.1 Analysis of Results : Relationship between the Performance of Value and Growth Stocks and US Net Portfolio Flows

We highlight a summary analysis of the results of the regressions in Table 7.2 as follows:

- Regression (Model I – contemporaneous and lagged flows) shows evidence of a positive relationship between stock returns and contemporaneous portfolio flows for both value and growth portfolios (see Section 7.7.1.1 below).
- However, there is lack of evidence of a relationship between lagged portfolio flows and returns for both value and growth portfolios (see Section 7.7.1.2 below).
- Regression (Model II – contemporaneous unexpected and expected flows) shows evidence that the positive relationship between value and growth returns and contemporaneous portfolio flows is driven by unexpected contemporaneous portfolio flows (see Section 7.7.1.4 below).

7.7.1.1 Contemporaneous Portfolio Flows

The results in Regression (Model I - contemporaneous and lagged flows) show that value and growth portfolios in six out of the nine countries have positive coefficients that are statistically significant. Their adjusted R^2 are in the range of between 9% and 18%. This can be interpreted as fairly high and may be used to contribute to a fund manager's ability to add value.

The coefficients are significantly positive for value and growth portfolios in:

- Hong Kong (T-statistic = 2.00 for Value portfolio & 2.44 for Growth portfolio)
- Japan (T-statistic = 4.98 for Value portfolio & 4.70 for Growth portfolio)
- Korea (T-statistic = 3.15 for Value portfolio & 2.48 for Growth portfolio)
- Malaysia (T-statistic = 2.47 for Value portfolio & 2.19 for Growth portfolio)
- Thailand (T-statistic = 2.25 for Value portfolio & 4.19 for Growth portfolio)

The coefficients are marginally significantly positive for value and growth portfolios in:

- Philippines (T-statistic = 1.88 for Value portfolio & 1.59 for Growth portfolio)

Both value and growth portfolios in Indonesia and Taiwan have positive coefficients that are not significant on contemporaneous portfolio flows. In fact the adjusted R^2 for Value and growth portfolios Taiwan are almost close to zero.

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Table 7.2 – Results of Regressions on Returns of Value and Growth Portfolios against US Net Portfolio Flows (excluding MA terms)

Notes for Table 7.2

Value (stocks in fractile 1) and growth (stocks in fractile 3) portfolios are formed on P/B. Firms are weighted equally within each portfolio. Row 1 contains the value of Constant whilst Rows 2-4 contain values of coefficients of variables used in Regression (Model I). The second row for each country contains the value of the coefficient on contemporaneous portfolio flows, denoted by Flows(0). The third and fourth rows for each country contain the values of the coefficients on the first lag and second lag of portfolio flows, denoted by Flows(-1) and Flows(-2) respectively. Rows 5-6 contain the values of the coefficients on expected and unexpected contemporaneous portfolio flows used in Regression (Model II), denoted by Expected(0)) and Unexpected (0) respectively. T-statistics of the coefficients of the variables are in (parentheses). Rows 7-8 show the values of R^2 and R^2 (adjusted) which represent the percentage of the explanatory power of the independent variables behind the variability of portfolio returns. The last row shows the value of Durbin-Watson that measures first-order serial correlation in the residuals of the regressions. The Durbin Watson value for all the countries is around 2 showing there is no existence of serial correlation.

We have also performed Regression (Model I) using change in US net portfolio flows as a set of independent variables. The results are reported in Table I in Appendix 1. We observe that the results in Appendix 1 show evidence of a positive relationship between returns of value and growth stocks and change in contemporaneous portfolio flows. However, there is a lack of statistical importance of change in portfolio flows explaining the returns of value and growth portfolios. The majority of value and growth portfolios do not observe an improvement in the adjusted R^2 when portfolio flows are replaced with change in portfolio flows as independent variables.

	VALUE		GROWTH	
Hong Kong 6/90-6/2001	**(I)**	**(II)**	**(I)**	**(II)**
Constant	2.10	2.72	0.97	1.37
	(1.67)	(1.92)	(1.15)	(1.30)
Flows(0)	464.38		463.36	
	(2.00)		(2.44)	
Flows(-1)	-154.30		-191.14	
	(-0.65)		(-0.94)	
Flows(-2)	-304.83		-334.94	
	(-1.23)		(-1.64)	
Expected(0)		-276.18		-204.71
		(-0.51)		(-0.42)
Unexpected (0)		571.63		536.95
		(2.44)		(2.71)
R^2	0.12	0.12	0.07	0.06
R^2 (adjusted)	0.09	0.10	0.05	0.04
Durbin-Watson	1.97	1.99	1.91	1.87

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Table 7.2 cont/. – Results of Regressions on Returns of Value and Growth Portfolios against US Net Portfolio Flows (excluding MA terms)

	VALUE		GROWTH	
Indonesia 6/93-6/2001	**(I)**	**(II)**	**(I)**	**(II)**
Constant	2.74	2.94	-0.08	0.20
	(1.14)	(1.13)	(-0.06)	(0.13)
Flows(0)	680.51		174.73	
	(1.33)		(0.61)	
Flows(-1)	619.07		326.45	
	(1.25)		(1.17)	
Flows(-2)	76.58		-68.37	
	(0.15)		(-0.24)	
Expected(0)		1148.49		48.03
		(0.67)		(0.05)
Unexpected (0)		493.68		63.28
		(1.01)		(0.23)
R^2	0.15	0.14	0.12	0.10
R^2 (adjusted)	0.12	0.11	0.08	0.07
Durbin-Watson	1.89	1.90	2.00	2.00
Japan 6/90-6/2001	**(I)**	**(II)**	**(I)**	**(II)**
Constant	-0.85	-0.65	-1.43	-1.12
	(-1.20)	(-0.77)	(-1.96)	(-1.30)
Flows(0)	3254.75		3406.91	
	(4.98)		(4.70)	
Flows(-1)	-654.02		-908.75	
	(-0.82)		(-1.11)	
Flows(-2)	-1220.80		-550.72	
	(-1.71)		(-0.75)	
Expected(0)		1132.89		1207.77
		(1.01)		(1.06)
Unexpected (0)		3607.38		3498.89
		(5.02)		(4.79)
R^2	0.19	0.17	0.16	0.16
R^2 (adjusted)	0.17	0.16	0.14	0.14
Durbin-Watson	1.84	1.82	2.18	2.13

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Table 7.2 cont/. – Results of Regressions on Returns of Value and Growth Portfolios against US Net Portfolio Flows (excluding MA terms)

	VALUE		GROWTH	
Korea 6/93-6/2001	**(I)**	**(II)**	**(I)**	**(II)**
Constant	0.83	0.38	-0.47	1.79
	(0.31)	(0.11)	(-0.27)	(0.65)
Flows(0)	1559.54		1038.29	
	(3.15)		(2.48)	
Flows(-1)	-691.69		-134.32	
	(-1.38)		(-0.33)	
Flows(-2)	-532.65		-578.84	
	(-1.06)		(-1.34)	
Expected(0)		534.78		-852.60
		(0.37)		(-0.66)
Unexpected (0)		1795.21		1038.29
		(3.91)		(2.50)
R^2	0.22	0.20	0.07	0.07
R^2 (adjusted)	0.18	0.18	0.04	0.05
Durbin-Watson	2.02	1.99	1.87	1.87
Malaysia 6/93-6/2001	**(I)**	**(II)**	**(I)**	**(II)**
Constant	2.15	2.36	0.66	0.78
	(1.30)	(1.33)	(0.49)	(0.53)
Flows(0)	4218.93		3087.45	
	(2.47)		(2.19)	
Flows(-1)	-712.74		-510.78	
	(-0.40)		(-0.35)	
Flows(-2)	3683.08		2271.97	
	(2.27)		(1.70)	
Expected(0)		6445.61		4414.77
		(1.60)		(1.34)
Unexpected (0)		4324.12		3060.57
		(2.34)		(2.03)
R^2	0.14	0.08	0.10	0.06
R^2 (adjusted)	0.11	0.06	0.07	0.04
Durbin-Watson	2.08	2.05	1.90	1.90

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Table 7.2 cont/. – Results of Regressions on Returns of Value and Growth Portfolios against US Net Portfolio Flows (excluding MA terms)

	VALUE		GROWTH	
Philippines 6/94-6/2001	**(I)**	**(II)**	**(I)**	**(II)**
Constant	2.32	9.24	-0.53	1.31
	(1.55)	(2.84)	(-0.50)	(0.56)
Flows(0)	962.54		576.43	
	(1.88)		(1.59)	
Flows(-1)	-1353.08		-338.27	
	(-2.63)		(-0.93)	
Flows(-2)	657.88		-347.16	
	(1.28)		(-0.95)	
Expected(0)		-7635.16		-2084.40
		(-2.21)		(-0.85)
Unexpected (0)		1024.65		543.52
		(2.01)		(1.50)
R^2	0.12	0.10	0.05	0.04
R^2 (adjusted)	0.09	0.08	0.01	0.01
Durbin-Watson	1.75	1.77	1.78	1.73
Singapore 6/90-6/2001	**(I)**	**(II)**	**(I)**	**(II)**
Constant	3.61	2.43	0.29	-0.07
	(1.59)	(1.04)	(0.41)	(-0.10)
Flows(0)	-616.07		-85.35	
	(-1.24)		(-0.55)	
Flows(-1)	1427.22		376.39	
	(2.73)		(2.30)	
Flows(-2)	-1078.93		171.11	
	(-2.18)		(1.10)	
Expected(0)		2115.43		1081.67
		(1.70)		(2.78)
Unexpected (0)		-726.34		-97.87
		(-1.46)		(-0.63)
R^2	0.07	0.04	0.07	0.06
R^2 (adjusted)	0.05	0.02	0.05	0.04
Durbin-Watson	1.85	1.94	1.90	1.84

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Table 7.2 cont/. – Results of Regressions on Returns of Value and Growth Portfolios against US Net Portfolio Flows (excluding MA terms)

	VALUE		GROWTH	
Taiwan 6/94-6/2001	**(I)**	**(II)**	**(I)**	**(II)**
Constant	-1.22	-1.69	-0.84	-1.13
	(-0.79)	(-0.85)	(-0.72)	(-0.69)
Flows(0)	440.17		842.07	
	(0.32)		(0.66)	
Flows(-1)	914.01		503.31	
	(0.70)		(0.39)	
Flows(-2)	591.78		899.80	
	(0.41)		(0.68)	
Expected(0)		3330.89		3069.47
		(0.81)		(0.85)
Unexpected (0)		578.64		1008.68
		(0.45)		(0.82)
R^2	0.06	0.06	0.02	0.02
R^2 (adjusted)	0.01	0.02	-0.01	-0.01
Durbin-Watson	2.01	2.01	1.97	1.95
Thailand 6/93-6/2001	**(I)**	**(II)**	**(I)**	**(II)**
Constant	0.95	1.73	-1.76	-1.00
	(0.78)	(1.19)	(-1.91)	(-0.91)
Flows(0)	2638.92		3711.71	
	(2.25)		(4.19)	
Flows(-1)	4302.80		3361.80	
	(3.72)		(3.86)	
Flows(-2)	-673.63		-538.82	
	(-0.58)		(-0.62)	
Expected(0)		1672.63		2023.98
		(0.35)		(0.60)
Unexpected (0)		2699.51		3878.64
		(2.05)		(3.90)
R^2	0.17	0.05	0.27	0.15
R^2 (adjusted)	0.15	0.02	0.24	0.13
Durbin-Watson	1.71	1.74	2.03	1.93

The Taiwan equity market is dominated by domestic retail investors. The movements in stock returns based on domestic retail portfolio flows are not captured in our results hence the low significant relationship between value and growth portfolio returns and contemporaneous (external) portfolio flows.

We note that Singapore is the only market that has a negative relationship between performance of value and growth portfolios and contemporaneous portfolio flows. However, this relationship is not significant with a T-statistic value of -1.24 and an adjusted R^2 of only 5%. It is interesting to note that we see evidence of reversal of previous returns for both value and growth stocks in Singapore. The coefficients on the first lag of portfolio flows for both value and growth portfolios are significant and positive. The portfolio flows exert price pressures causing returns to exhibit reversals as prices return to levels reflecting the underlying fundamentals of securities after price pressure or investor sentiment wave has passed. This results in negative relation between contemporaneous portfolio flows and stock returns. It is also interesting to observe return reversals after 1 month for the value portfolio but this return reversal extends to 2 months in the case of growth portfolio. As for the growth portfolio in Singapore, both the coefficients on first and second lag of flows are positive (although only the first lag is significant) reversing to negative for the contemporaneous portfolio flows

The Singapore equity market appears to be strongly dominated by international portfolio flows because of the relatively small domestic retail market. This is observed in the statistically positive relationship between the returns of value and growth portfolios and lagged fund flows (first lag of fund flows). Only a small portion of the domestic state managed pension funds, which form the bulk of institutional funds, during the sample period were invested in equity securities. Therefore, one sees a very strong influence of lagged international portfolio flows on the domestic market which was not sustained in the future by domestic retail portfolio flows causing the reversal in stock returns.

7.7.1.2 Lagged Portfolio Flows

As mentioned earlier, we now proceed to provide observations to show that Regression (Model I) in Table 7.2 shows lack of evidence of a relationship between lagged portfolio flows and returns for both value and growth portfolios. As evidenced below, we observe that the relationship between lagged portfolio flows and returns is not robust across all markets:

The coefficient on the first lag of portfolio flows is significant for only value portfolio in Philippines (negative coefficient); and value and growth portfolios in Singapore (positive coefficient) and Thailand (positive coefficient). The coefficients on the second lag of portfolio flows are significant for only value portfolio in Singapore. None of the coefficients are significant on the second lag of flows for the growth portfolios.

We highlight some observations on value and growth portfolios in Philippines and Thailand which show evidence of consistency with price pressure hypothesis and information revelation hypothesis respectively as discussed below:

As for Philippines, the results in Regression (Model I) in Table 7.2 show evidence of reversal of previous returns for value and growth portfolios. The coefficients for the first lag of portfolio flows are negative for both value and growth portfolios although only significant for the value portfolio. Similar to our observation in Singapore, the portfolio flows exert price pressures causing returns to exhibit reversals as prices return to levels reflecting the underlying fundamentals of stocks after price pressure or sentiment wave has passed. Therefore, this results in negative relation between first lag of portfolio flows and returns. We observe return reversals after 1 month for value portfolio but this return reversal extends to 2 months in the case of growth portfolio

Value and growth portfolios in Thailand have significant and positive coefficients on the first lag of portfolio flows as shown by the results in Regression (Model I) in Table 7.2. Thailand shows evidence that portfolio flows exhibit positive serial correlation, thus affecting future returns. It also highlights the persistence in portfolio flows due to 'herd like' behaviour of investors as observed in the significant and positive coefficient on the contemporaneous fund flows. It may also be consistent with the hypothesis that information revelation is an explanation for a positive relationship between portfolio flows and subsequent return – if investors possess information, or trade in the same direction as another group of investors who possess information, their trades will be associated with new information. As the market responds to this information revelation, price will move in the same direction as the portfolio flows affecting subsequent returns in the same direction.

7.7.1.3 Summary of Results of Observations in Contemporaneous and Lagged Portfolio Flows

In conclusion, the results of Regression (Model I) in Table 7.2 show evidence that there is a positive relationship between contemporaneous portfolio flows and returns for both value and growth portfolios. However, the lack of evidence of a relationship between lagged portfolio flows and returns, indicates that information about future inflows are contained in contemporaneous portfolio flows and hence cannot be used to predict future returns.

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This raises the question whether returns are related to the unexpected component of contemporaneous portfolio flows. Regression (Model II - contemporaneous unexpected and expected flows in Table 7.2, (see (d) below)) looks closely at this question – it addresses the impact of unexpected and expected contemporaneous portfolio flows on the performance of value and growth stocks.

7.7.1.4 Relationship Between the Performance of Value and Growth Stocks and Expected/Unexpected Contemporaneous Flows

In this section we observe that based on Regression (Model II) in Table 7.2 we see evidence of a positive relationship between stock returns and unexpected contemporaneous portfolio flows for both value and growth portfolios. The coefficients on unexpected contemporaneous portfolio flows are large and significant. For example, in Japan, the coefficient on unexpected contemporaneous portfolio flows has a T-statistic value of 5.02 (value portfolio) and 4.79 (growth portfolio).

On the other hand, expected contemporaneous portfolio flows are not correlated with stock returns for value and growth portfolios.

One of the striking characteristics is the robustness of the results. The coefficients on unexpected contemporaneous portfolio flows (based on Regression Model II), as well as contemporaneous portfolio flows (based on Regression Model I) in Table 7.2 are significantly positive for the same sets of markets for both value and growth portfolios.

The adjusted R^2 for Regression (Model II) is almost the same as the adjusted R^2 for Regression (Model I) with the exception of value and growth portfolios in Malaysia and Thailand. We had discussed earlier the methodology in obtaining the time-series data for expected and unexpected portfolio flows. The unexpected and expected portfolio flows have been derived from the coefficients in the AR models of the regression on contemporaneous portfolio flows against lagged flows.

The difference in adjusted R^2 between Regression (Model II) and the adjusted R^2 for Regression (Model I) could be due to the fact that lagged portfolio flows (as defined in AR models) are not the only explanatory variables driving contemporaneous portfolio flows in Malaysia and Thailand e.g. there are other factors such as country risk premium and other event driven factors such as political, government policies and macro economic changes. The use of unexpected and expected flows in Regression (Model II) causes the adjusted R^2 to be lower in explaining the performance of value and growth stocks, compared to the use of raw contemporaneous portfolio flows and raw lagged flows to explain portfolios of stock returns.

Both value and growth portfolios in Indonesia and Taiwan have positive coefficients that are not significant on both unexpected and expected contemporaneous portfolio flows. This is expected, given that both Indonesia and Taiwan have positive coefficients that are not significant on contemporaneous portfolio flows using Regression (Model I).
The coefficients on unexpected portfolio flows are negative but not significant for Value and Growth portfolios in Singapore. This is not surprising, given that the coefficients on contemporaneous portfolio flows based on Regression (Model I) are also negative and not significant for value and growth portfolios in Singapore.

As mentioned earlier, we now proceed to provide observations on Regression (Model II) in Table 7.2 to show that expected contemporaneous portfolio flows are not correlated with stock returns for value and growth portfolios.

None of the coefficients on expected contemporaneous portfolio flows are significant. The only exceptions are the value portfolio in Philippines, which has a negative and significant coefficient, and growth portfolio in Singapore, which has a positive and significant coefficient on expected contemporaneous portfolio flows. This is also not surprising given that value portfolio in Philippines has a negative and significant coefficient on the first lag of portfolio flows while value and growth portfolios in Singapore have positive and significant coefficients on the first lag of portfolio flows. Both these markets are dominated by international portfolio flows. Investors form their expectations on past portfolio flows behaving either in a 'contrarian' or adopt a 'herd-like' behaviour.

We can thus conclude that the positive relationship between value and growth returns and contemporaneous portfolio flows (observed in Regression Model I) is driven by unexpected contemporaneous portfolio flows.

However, we find that the results in Sections 7.7.1.1 to 7.7.1.4 show similar impact on the performance of value and growth returns. Investor behaviour measured by foreign portfolio flows has not been able to explain the differences in performance between value and growth portfolios.

Therefore, we proceed to analyse the impact of a different measure for investor behaviour based on reliance on analysts' forecasts. We test this using analysts' forecast errors on the performance of value and growth stocks in Section 7.7.2 below.

7.7.2 Analysis of Results: Relationship Between the Performance of Value and Growth Stocks and Analysts' Forecast Errors on a Standalone Basis as well as in Combination with US Net Portfolio Flows

We highlight the summary analysis of the results as follows:

- The regression results in Tables 7.5 and 7.6 show that the explanatory role of a combination of positive forecast errors and US net portfolio flows is more significant on the performance of value stocks compared to growth stocks. (see Sections 7.7.2.3 – 7.7.2.4 below)
- Negative forecast errors both on a standalone basis and in combination with US net portfolio flows appears insignificant on the performance of both value and growth stocks. (see Sections 7.7.2.3 – 7.7.2.4 below)

Before we proceed with a detailed analysis of the results of the regressions, we perform some preliminary tests on the forecast errors as well as the distribution of forecast errors for value and growth portfolios in each country (see Sections 7.7.2.1 – 7.7.2.2 below).

7.7.2.1 Descriptive Results Based on Average Forecast Errors for Value and Growth Portfolios

Table 7.3 below summarises the average forecast errors for value and growth portfolios in each country. The average forecast errors are defined using 4 different metrics:

- Forecast Error I defined as forecast error as a percentage over actual EPS,
- Forecast Error II defined as forecast error as a percentage over forecast EPS,
- Forecast Error III defined as forecast error as a percentage over standard deviation of analysts' forecasts,
- Forecast Error IV defined as forecast error as a percentage over share price.

The results in Table 7.3 below show evidence that analysts have overestimated future earnings growth for both value and growth portfolios in every country. over the sample period This is similar to the findings of Dechow & Sloan (1997) and Levis & Liodakis (1999). On closer analysis, our results also show that analysts' forecasts display systematic optimism for both value and growth stocks during the 1997/1998 Asian crisis period.The results are consistent with studies conducted by Loh and Mian (2003) on the Singapore market during the Asian crisis period. The results indicate that analysts failed to incorporate negative information during the crisis period. Both our results and those of Loh and Mian suggest that analysts arguably amongst the most astute of market participants exhibit systematic biases in forming their expectations during periods of heightened economic uncertainty.

Further, the results show that the forecast errors are on an average more 'negative' for value portfolio in each country than the corresponding growth portfolio (implying that the analysts' forecasts for value stocks are more optimistic compared to the analysts' forecasts for growth stocks). This is also the case for most markets during the Asian crisis period. Thus we look closer at the distribution of the forecast errors. Table 7.4 below shows the results of the distribution of forecast errors focusing on Forecast Error I.

Table 7.3 – Average Earnings Forecast Errors for Value and Growth Portfolios

Portfolio	Forecast Errors I	Forecast Errors II	Forecast Errors III	Forecast Errors IV
Hong Kong V	-0.50	-0.26	-1.08	-0.06
Hong Kong G	-0.13	-0.06	-0.54	-0.01
Indonesia V	-0.85	-0.96	-3.37	-0.36
Indonesia G	-0.33	-0.14	-1.38	-0.02
Japan V	-0.53	-0.73	-2.65	-0.02
Japan G	-0.35	-0.26	-1.26	-0.01
Korea V	-0.54	-1.27	-2.38	-0.19
Korea G	-0.37	-0.45	-1.94	-0.01
Malaysia V	-0.47	-0.28	-0.97	-0.03
Malaysia G	-0.17	-0.05	-0.32	-0.01
Philippines V	-0.87	-1.53	-2.47	-0.14
Philippines G	-0.21	-0.10	-0.65	-0.01
Singapore V	-0.37	-0.19	-0.95	-0.01
Singapore G	-0.19	-0.09	-0.54	-0.01
Taiwan V	-0.96	-0.64	-1.60	-0.03
Taiwan G	-0.18	-0.03	-0.25	-0.00
Thailand V	-0.57	-0.51	-2.45	-0.06
Thailand G	-0.42	-0.33	-2.11	-0.03

Notes for Table 7.3

Value (stocks in fractile 1) and growth (stocks in fractile 3) portfolios are formed on P/B. Firms are weighted equally within each portfolio. V denotes value portfolio while G denotes growth portfolio. The average forecast errors are defined using 4 different metrics: forecast errors as a percentage over actual EPS denoted by Forecast Errors I, forecast errors as a percentage over forecast EPS denoted by Forecast Errors II, forecast errors as a percentage over standard deviation of analysts' forecasts denoted by Forecast Errors III and forecast errors as a percentage over share price denoted by Forecast Errors IV.

The data consists of all companies that have an EPS consensus forecast produced at least by 1 analyst. Most studies that use the above definitions of forecast errors require at least 3-5 analysts to produce forecasts for the firms' EPS. We found that we are losing too many observations especially from small companies in the smaller Asian markets when we impose the restriction of only including companies with forecasts EPS provided by 3-5 analysts. The data is also trimmed to eliminate suspect data and outliers. All companies with forecast errors below the 5th percentile value and above the 95th percentile value are removed from our sample.

We have also reported the results on data set that consists of all companies that have EPS consensus forecasts produced by at least 3 analysts in Table I in Appendix 2. The results are similar and show that the forecast errors are on average more 'negative' for value portfolio in each country than the corresponding growth portfolio.

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Table 7.4 – Distribution of Earnings Forecast Errors for Value and Growth Portfolios

Country	Value	Growth
Hong Kong		
Average Forecast Error I	-0.50	-0.13
No of Positive Forecast Error	91 (29%)	242 (42%)
No of Negative Forecast Error	220 (71%)	333 (58%)
Indonesia		
Average Forecast Error I	-0.85	-0.33
No of Positive Forecast Error	25 (26%)	84 (45%)
No of Negative Forecast Error	71 (74%)	104 (55%)
Japan		
Average Forecast Error I	-0.53	-0.35
No of Positive Forecast Error	867 (29%)	1338 (38%)
No of Negative Forecast Error	2137 (71%)	2188 (62%)
Korea		
Average Forecast Error I	-0.54	-0.37
No of Positive Forecast Error	86 (35%)	78 (39%)
No of Negative Forecast Error	158 (65%)	121 (61%)
Malaysia		
Average Forecast Error I	-0.47	-0.17
No of Positive Forecast Error	120 (40%)	185 (45%)
No of Negative Forecast Error	183 (60%)	230 (55%)
Philippines		
Average Forecast Error I	-0.87	-0.21
No of Positive Forecast Error	13 (18%)	58 (42%)
No of Negative Forecast Error	59 (82%)	81 (58%)
Singapore		
Average Forecast Error I	-0.37	-0.19
No of Positive Forecast Error	105 (38%)	132 (41%)
No of Negative Forecast Error	173 (62%)	188 (59%)
Taiwan		
Average Forecast Error I	-0.96	-0.18
No of Positive Forecast Error	78 (31%)	145 (47%)
No of Negative Forecast Error	172 (69%)	161 (53%)
Thailand		
Average Forecast Error I	-0.57	-0.42
No of Positive Forecast Error	56 (29%)	115 (35%)
No of Negative Forecast Error	137 (71%)	218 (65%)

Notes for Table 7.4

Value (stocks in fractile 1) and growth (stocks in fractile 3) portfolios are formed on P/B. Firms are weighted equally within each portfolio. The first row for each country is the Average Forecast Error I that is defined as forecast error as a percentage of actual EPS. The second and third rows contain number of positive and number of negative forecast errors respectively as well as percentage over total in (parentheses).

The data consists of all companies that have an EPS consensus forecast produced at least by 1 analyst. Most studies that use the above definitions of forecast errors require at least 3-5 analysts to produce forecasts for the firms' EPS. We found that we are losing too many observations especially from small companies in the smaller Asian markets when we impose the restriction of only including companies with forecasts EPS provided by 3-5 analysts. The data is also trimmed to eliminate suspect data and outliers. All companies with forecast errors below the 5th percentile value and above the 95th percentile value are removed from our sample.

We have also reported the results on data set that consists of all companies that have EPS consensus forecasts produced by at least 3 analysts in Table II in Appendix 2. The results are similar and show that the forecast errors are on average more 'negative' for value portfolio in each country than the corresponding growth portfolio.

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The results in Table 7.4 show that the proportion of negative forecast errors is higher for value portfolios compared to growth portfolios across countries. About 70% of analysts' projections are on average proven to be optimistic for value portfolios across the countries compared to 58% of analysts' projections that are on average proven to be optimistic for growth portfolios. This is probably due to the fact that the Asian Markets are inefficient and dependent on foreign portfolio flows which are usually dominated by institutional money. Institutional money in Asian Markets tend to invest in larger capitalization stocks (such as Singapore Telecom) due to liquidity reasons. This causes large capitalization stocks to be priced as 'growth stocks'. The small and medium capitalization stocks which exhibit growth characteristics are ignored by institutional investors causing them to be priced as 'value stocks' despite their growth characteristics. Typically, one finds that more analysts cover large capitalization stocks compared to small/medium capitalization stocks. As we have stated before, our universe of stocks contains stocks covered by at least one analyst. Our universe therefore includes both small and large capitalization stocks.

We also replicate the above analysis using a universe of stocks that consists of all companies that have an EPS consensus forecast produced by at least 3 analysts.
The results in Table I in Appendix 2 also show that the forecast errors are on an average more 'negative' for value portfolio in each country than the corresponding growth portfolio The distribution of the forecast errors in Table II in Appendix 2 also show that the proportion of negative forecast errors is higher for value portfolios compared to growth portfolios across countries. About 71% of analysts' projections are on average proven to be optimistic for value portfolios across the countries compared to 58% of analysts' projections that are on average proven to be optimistic for growth portfolios.

Empirical evidence in Table 7.3 and 7.4 (as well as Tables I and II in Appendix 2) are inconsistent with the naïve expectational error theory – "analysts make systematic errors on earning forecasts; excessive optimism (negative forecast errors) for growth stocks and excessive pessimism (positive forecast errors) for Value stocks."

We then proceed to analyse whether positive and negative forecast errors are able to explain the differences in performance between value and growth stocks.

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7.7.2.2 Results Based on the Impact of Positive and Negative Forecast Errors on the Performance of Value and Growth Portfolios

Before we proceed with analyzing our results, we review the expectational error theory as suggested by Dechow and Sloan (1997) and La Porta (1996). They assume that stock prices naively incorporate analysts' forecasts of earnings growth. The investor realization of actual earnings per share figures following excessive reliance on optimism of analysts for growth stocks and pessimism for value stocks creates positive surprises for value stocks. This results in upside price movement for value stocks and downward price movement for growth stocks.

The expectational theory thus implies that a positive forecast error for a value stock is perceived by investors and analysts as an unexpected piece of good news and consequently causes an upward movement in share price. A negative forecast error on the other hand is not an unexpected event for value stocks and will only have a moderate impact on their share prices. Similarly, a company with high values of P/B (growth stock) is naively priced with expectations of past high growth rates continuing into the future. For this company, a positive forecast error is a non-event having less of an impact on its share price unlike a negative forecast error significantly affecting its share price negatively.

Regression (Model I - forecast errors) in Table 7.5 and 7.6 show the results of the regressions using the returns of value and growth portfolios against positive forecast errors and negative forecast errors respectively on a standalone basis.

Positive forecast errors on a standalone basis does not have a significant impact on the returns of value stocks (T-statistic = 0.78) while having a bigger and significant impact on the performance of growth stocks (T-statistic = 5.22) as observed in Table 7.5. Moreover, the R^2 for the Growth portfolio is 4% compared to an insignificant R^2 for the value portfolio.

The relationship between positive forecast errors and the performance of value and growth portfolios is inconsistent with the expectational error theory as discussed above. This is probably due to the excessive optimism noted in the forecasts for value stocks relative to growth stocks as observed in Table 7.4. Hence, a positive forecast error for a value stock has less effect on its price performance relative to a growth stock.

Table 7.5 - Impact of Positive Forecast Errors I on the Returns of Value and Growth Portfolios

	VALUE		GROWTH	
Independent Variables	**(I)**	**(II)**	**(I)**	**(II)**
Constant	0.01	-0.02	-0.02	-0.04
	(1.01)	(-1.93)	(-1.73)	(-5.63)
Forecast Errors (+)	0.03	0.09	0.23	0.28
	(0.78)	(2.64)	(5.22)	(15.97)
Expected Flows (0)		2.23		0.78
		(3.58)		(4.32)
Unexpected Flows (0)		3.88		1.59
		(6.46)		(10.58)
R^2	0.00	0.16	0.04	0.08
R^2 (adjusted)		0.12		0.04

Table 7.6– Impact of Negative Forecast Errors I on the Returns of Value and Growth Portfolios

	VALUE		GROWTH	
Independent Variables	**(I)**	**(II)**	**(I)**	**(II)**
Constant	0.02	0.02	0.01	-0.03
	(1.53)	(0.86)	(0.71)	(-2.06)
Forecast Errors (-)	0.01	0.02	0.04	-0.00
	(1.12)	(1.29)	(1.70)	(-0.18)
Expected Flows (0)		1.07		0.74
		(2.43)		(1.85)
Unexpected Flows (0)		2.18		1.56
		(6.42)		(4.56)
R^2	0.00	0.06	0.00	0.06
R^2 (adjusted)		0.02		0.01

Notes for Table 7.5 & 7.6

Value (stocks in fractile 1) and growth (stocks in fractile 3) portfolios are formed on P/B and according to the sign of analysts' forecasts. Firms are weighted equally within each portfolio. We make use of data that consists of all companies that have an EPS consensus forecast produced at least by 1 analyst to increase the breadth of companies with large as well as small capitalization stocks in our sample universe. All companies with forecast errors below the 5th percentile value and above the 95th percentile value are removed from our sample .Row 1 contains the value of Constant. The second row contains the values of the coefficients on Forecast Errors I used as a standalone variable in Regression (Model I) and in combination with portfolio flows as independent variables in Regression (Model II). The third and fourth rows contain the values of the coefficients on expected and unexpected contemporaneous portfolio flows used in Regression (Model II), denoted by Expected(0)) and Unexpected (0) respectively. T-statistics of the coefficients of the variables are in (parentheses). Rows 5-6 show the values of R^2 and R^2 (adjusted) which represent the percentage of the explanatory power of the independent variables behind the variability of portfolio returns.

We have also reported the results of regressions (Model I) and (Model II) on data set that consists of all companies that have EPS consensus forecasts produced by at least 3 analysts in Tables III and IV in Appendix 2. The results in Tables III and IV in Appendix 2 also highlight performance of value and growth stocks in Asian Markets is driven by a combination of positive forecast errors and contemporaneous flows (primarily unexpected flows). Negative forecast errors do not have much of an impact on performance of both value and growth stocks when used as a standalone independent variable and in combination with portfolio flows as independent variables (values of of R^2 and R^2 (adjusted) are insisgnificant). This is due to the fact that

Notes for Table 7.5 & 7.6 cont/.

analysts forecast errors are overwhelmed by unexpected portfolio flows (dominant variable). The use of a combination of positive forecast errors and flows explain 13% of the performance of value stocks while explaining 5% of the performance of growth stocks. The use of a combination of negative forecast errors and flows explain 1% of the performance of Value stocks while explaining only 0% of the performance of growth stocks.

Our conclusions are similar for a universe of companies that have EPS consensus forecasts produced by at least 3 analysts :-
- the explanatory role of negative forecast errors on a standalone basis and in combination with flows appears relatively insignificant on the performance of both value and growth stocks.

- the use of a combination of positive forecast errors and expected and unexpected contemporaneous flows plays a better role in explaining the performance of value stocks compared to growth stocks.

The results in Table 7.6 using negative forecast errors on a standalone basis are also inconsistent with the expectational error theory. Growth portfolio has only a marginally significant positive coefficient (T-statistic = 1.70) against negative forecast errors (positive coefficient indicates that large negative forecast errors will cause a decline in portfolio returns). The coefficient on negative forecast errors is smaller but not significant (T-statistic = 1.12) despite the fact that there exists overoptimism in the forecasts of value stocks as noted in Table 7.4.

Based on the expectational error theory, one would have expected negative forecast errors to have a significant negative impact on the value stocks due to the overoptimism in forecasts. However, we observe in Table 7.4 that despite the overoptimism in the analysts' earnings forecasts for value stocks, there is no significant negative impact on value stocks. This is probably due to the fact that the market has still not priced in the analysts' expectations of growth for the value stocks. Therefore, the disappointment of not realizing the analysts' overoptimistic expectations of growth has a relatively insignificant impact on the performance of value stocks.

As for the growth stocks, although the analysts' expectations are less optimistic for growth stocks relative to value stocks in Table 7.4, the market still prices the growth stocks as if high past growth rates would continue to manifest in the future. Hence, the disappointment of not realising the analysts' forecasts has a negative albeit marginally significant consequence on the price performance of growth stocks.

The above results show that positive forecast errors on a standalone basis does not have a significant impact on the returns of value stocks while having a bigger and significant impact on the performance of growth stocks inconsistent with the expectational error theory. This is due to the excessive optimism observed in value stocks relative to growth stocks. Growth portfolio has a positive albeit marginally significant coefficient against negative forecast errors but value portfolio does not have a significant coefficient against negative forecast errors.

We next proceed to test whether the above relationship between the positive/negative forecast errors on a standalone basis persist even when the forecast errors are used in combination with US net portfolio flows in the regressions on the performance of value and growth portfolios.

7.7.2.3 Results Based on the Impact of a Combination of Forecast Errors and Flows on the Performance of Value and Growth

Regression (Model II - combination of forecast errors and portfolio flows) in Table 7.5 and 7.6 show the results of the regressions using the returns of value and growth portfolios against a combination of US net portfolio flows and either positive forecast errors and negative forecast errors respectively. We make use of expected and unexpected contemporaneous US net portfolio flows in this analysis since we concluded in Section 7.7.1 that the relationship between value and growth performance and contemporaneous portfolio flows is driven by unexpected contemporaneous portfolio flows.

The results in Regression (Model II) in Table 7.5 show that when we use positive forecast errors in combination with expected and unexpected contemporaneous flows, we find that the coefficient on positive forecast errors against the performance of value portfolio appears positive and significant. This contrasts with our earlier findings where the coefficient on the positive forecast errors is insignificant when used on a standalone basis. This may be due to the fact that the flows act as 'instruments' for the forecast errors. Both positive forecast errors, expected and unexpected contemporaneous flows are jointly significant. This implies value portfolio of stocks with positive forecast errors gets noticed by the market. The R^2 for the regression using a combination of forecast errors and flows increases to 16% with the adjusted R^2 at 12%.

As for growth stocks, Regression (Model II) in Table 7.5 shows that positive forecast errors, expected and unexpected contemporaneous flows are jointly significant. We also observe that the coefficient on the positive forecast errors increases in value and significance compared to when it is used on a standalone basis. Again this suggests that the flows act as 'instruments' for the forecast errors. The adjusted R^2 for the growth portfolio is 4% compared to that of the value portfolio at 12%. The use of a combination of positive forecast errors and expected and unexpected contemporaneous flows plays a better role in explaining the performance of value stocks compared to growth stocks.

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Similar to the results in Regression (Model II) in Table 7.5, Regression (Model II) in Table 7.6 shows that when we use the independent negative forecast errors in combination with expected and unexpected contemporaneous flows; the R^2 for the regression increases. In this case, the R^2 increases to 6% with the adjusted R^2 at 2% for value portfolio. The coefficient on negative forecast errors remains insignificant. Instead, only both expected and unexpected contemporaneous flows play a role in explaining the performance of value stocks that exhibit negative forecast errors.

We now proceed to observe the results of the regression based on the performance of growth stocks as shown in Regression (Model II) in Table 7.6. The results show that when we use negative forecast errors in combination with expected and unexpected contemporaneous flows, the coefficient on negative forecast errors against the performance of growth portfolio loses its significance as compared to being marginally significant when negative forecast errors are used on a standalone basis. Unexpected contemporaneous flows is the most significant similar to our observations in Regression (Model II) in Table 7.5. The R^2 for the growth portfolio increases to 6% with the adjusted R^2 at 1% when we use negative forecast errors in combination with the flows to explain the performance of growth stocks compared to an insignificant R^2 when only the negative forecast errors is used on a standalone basis to explain the performance of the growth portfolio.

In conclusion, we find that the performance of value and growth stocks in Asian Markets is driven by a combination of positive forecast errors and contemporaneous flows (primarily unexpected flows). Negative forecast errors do not have much of an impact on performance of both value and growth stocks when used as a standalone variable and in combination with portfolio flows. This is due to the fact that analysts forecast errors are overwhelmed by unexpected portfolio flows (dominant variable). The use of a combination of positive forecast errors and flows explain 12% of the performance of value stocks while explaining 4% of the performance of growth stocks. The use of a combination of negative forecast errors and flows explain 2% of the performance of value stocks while explaining only 1% of the performance of growth stocks.

The use of a combination of positive forecast errors and expected and unexpected contemporaneous flows plays a better role in explaining the performance of value stocks compared to growth stocks. The explanatory role of negative forecast errors on a standalone basis and in combination with flows appears relatively insignificant on the performance of both value and growth stocks. Our conclusions are also similar for a universe of companies that have EPS consensus forecasts produced by at least 3 analysts. (see results in Tables III and IV in Appendix 2).

7.7.3 Conclusion

We observe in Section 7.7.1 that there is a positive relationship between contemporaneous portfolio flows and returns for both value and growth portfolios. There appears to be a lack of evidence in the relationship between lagged portfolio flows and returns indicating that information about future inflows are contained in contemporaneous flows.

This prompted us to extend the investigation further to determine whether the returns of value and growth stocks are related to the unexpected component of the contemporaneous flows. Our results show that the positive relationship between value and growth returns and contemporaneous portfolio flows is driven by unexpected contemporaneous portfolio flows.

However, we find that the relationship between unexpected contemporaneous portfolio flows and returns is similar for both value and growth portfolios. Thus, investor behavior measured by portfolio flows as a standalone variable has not been able to differentiate the the performance between value and growth portfolios.

Next, in Section 7.7.2, we analysed the impact of analysts' forecast errors on the performance of value and growth stocks. Empirical evidence shows that analysts have overestimated future earnings growth for both value and growth stocks in every country in our sample universe of Asian Markets across the sample period. Further analysis show that analysts' forecasts display systematic optimism for both value and growth stocks during the 1997/1998 Asian crisis period. We also observe that forecast errors are on average more negative for value portfolios in each country than the corresponding growth portfolio indicating that analysts are on average more optimistic on growth expectations of value stocks compared to growth stocks in the Asian markets. We observe similar traits in analysts' forecasts during the 1997/1998 Asian crisis period suggesting that analysts fail to incorporate negative information and therefore exhibit systematic biases in forming their expectations during periods of heightened economic uncertainty.

Positive forecast errors as a standalone variable does not have a significant impact on the returns of value stocks while having a bigger and significant impact on the performance of growth stocks inconsistent with the expectational error theory. This is due to the excessive optimism observed in value stocks relative to growth stocks. Growth portfolio has a positive albeit marginally significant coefficient against negative forecast errors but value portfolio does not have a significant coefficient against negative forecast errors.

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The significance of the above relationship between returns and positive/negative forecast errors on a standalone basis changes when the independent forecast errors are used in combination with US net portfolio flows in the regressions on the performance of value and growth portfolios.

As for value portfolio, when we use positive forecast errors in combination with expected and unexpected contemporaneous flows, we find that the coefficient on positive forecast errors against the performance of the portfolio appears positive and significant compared to being insignificant when positive forecast errors is used on a standalone basis.
Both positive forecast errors, expected and unexpected contemporaneous flows are jointly significant in explaining the performance of value stocks.

As for value portfolio, when we use the negative forecast errors in combination with expected and unexpected contemporaneous flows; the R^2 for the regression increases to 6% but the adjusted R^2 is only at 2%. The coefficient on negative forecast errors remains insignificant.

The use of a combination of positive forecast errors and flows explain 12% of the performance of value stocks while the use of a combination of negative forecast errors and flows explain 2% of the performance of value stocks. Thus, the explanatory role of a combination of negative forecast errors and flows appears relatively insignificant compared to the role of a combination of positive forecast errors and flows on the performance of value stocks.

As for growth stocks, the results show that positive forecast errors and expected / unexpected contemporaneous flows are jointly significant. The adjusted R^2 for the Growth portfolio is 4% compared to that of the value portfolio at 12%. The use of a combination of positive forecast errors and expected and unexpected contemporaneous flows plays a better role in explaining the performance of value stocks compared to growth stocks.

As for growth portfolio, when we use the negative forecast errors in combination with expected and unexpected contemporaneous flows, we find that the coefficient on negative forecast errors against the performance of the portfolio loses its significance. Unexpected contemporaneous flows is the most significant of the variables. The adjusted R^2 for the growth portfolio is only at 1% when we use the negative forecast errors in combination with the flows to explain the performance of growth stocks. Thus, the explanatory role of a combination of negative forecast errors and flows appears relatively insignificant on the performance of growth stocks.

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The results show evidence that the performance of value and growth stocks in Asian Markets is driven by a combination of positive forecast errors and contemporaneous flows (primarily unexpected flows). Negative forecast errors do not have much of an impact on performance of both value and growth stocks when used on a standalone basis as well as in combination with portfolio flows. This is due to the fact that analysts forecast errors are overwhelmed by unexpected portfolio flows (dominant variable). The use of a combination of positive forecast errors and flows explain 12% of the performance of value stocks while explaining 4% of the performance of growth stocks. The use of a combination of negative forecast errors and flows explain 2% of the performance of value stocks while explaining only 1% of the performance of growth stocks.

We conclude that the explanatory role of negative forecast errors both on a standalone basis as well as in combination with flows appears relatively insignificant on the performance of both value and growth stocks. Both positv forecast errors and flows are jointly significant in explaining the performance of value and growth stocks. However, the use of a combination of positive forecast errors and expected and unexpected contemporaneous flows plays a better role in explaining the performance of value stocks compared to growth stocks. Our conclusions are also similar for a universe of companies that have EPS consensus forecasts produced by at least 3 analysts. (see results in Tables III and IV in Appendix 2).

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Appendix 1 – Table I – Results of Regressions on Returns of Value and Growth Portfolios against Change in US Net Portfolio Flows (excluding MA terms)

	VALUE	GROWTH
Hong Kong 6/90-6/2001	**(I)**	**(I)**
Constant	2.13	0.93
	(1.92)	(1.31)
Flows(0)	725.03	590.49
	(3.37)	(3.20)
Flows(-1)	639.01	408.83
	(2.68)	(2.21)
Flows(-2)	516.33	234.44
	(2.36)	(1.24)
R^2	0.16	0.08
R^2 (adjusted)	0.13	0.06
Durbin-Watson	1.96	1.88
Indonesia 6/93-6/2001	**(I)**	**(I)**
Constant	3.87	0.29
	(1.65)	(0.22)
Flows(0)	491.39	132.47
	(1.03)	(0.49)
Flows(-1)	966.49	438.16
	(1.46)	(1.18)
Flows(-2)	665.63	246.56
	(1.39)	(0.91)
R^2	0.15	0.12
R^2 (adjusted)	0.11	0.08
Durbin-Watson	1.88	1.99
Japan 6/90-6/2001	**(I)**	**(I)**
Constant	0.16	-0.23
	(0.28)	(-0.39)
Flows(0)	2754.18	2544.15
	(4.10)	(3.69)
Flows(-1)	1749.17	1223.12
	(2.59)	(1.76)
Flows(-2)	-188.14	-83.52
	(-0.28)	(-0.12)
R^2	0.16	0.12
R^2 (adjusted)	0.13	0.10
Durbin-Watson	1.65	1.90
Korea 6/93-6/2001	**(I)**	**(I)**
Constant	1.42	0.04
	(0.73)	(0.03)
Flows(0)	1617.58	977.51
	(3.63)	(2.61)
Flows(-1)	1124.82	1060.71
	(1.75)	(2.27)
Flows(-2)	457.02	552.22
	(1.02)	(1.40)
R^2	0.23	0.09
R^2 (adjusted)	0.19	0.06
Durbin-Watson	2.02	1.90

Chapter 7 – Role of Investor Sentiment on the Performance of Value and Growth Stocks

Appendix 1 – Table I cont/. – Results of Regressions on Returns of Value and Growth Portfolios against Change in US Net Portfolio Flows (excluding MA terms)

	VALUE	GROWTH
Malaysia 6/93-6/2001	**(I)**	**(I)**
Constant	1.58	0.26
	(0.90)	(0.18)
Flows(0)	1206.97	1062.66
	(0.77)	(0.84)
Flows(-1)	-528.10	-128.18
	(-0.32)	(-0.10)
Flows(-2)	2437.21	1791.58
	(1.59)	(1.44)
R^2	0.04	0.03
R^2 (adjusted)	0.01	0.00
Durbin-Watson	1.98	1.85
Philippines 6/94-6/2001	**(I)**	**(I)**
Constant	2.49	-0.60
	(1.86)	(-0.63)
Flows(0)	1014.61	706.77
	(2.20)	(2.15)
Flows(-1)	-258.36	499.55
	(-0.49)	(1.33)
Flows(-2)	499.54	299.45
	(1.08)	(0.91)
R^2	0.13	0.06
R^2 (adjusted)	0.10	0.02
Durbin-Watson	1.74	1.79
Singapore 6/90-6/2001	**(I)**	**(I)**
Constant	3.56	0.64
	(1.61)	(0.90)
Flows(0)	-751.09	-263.86
	(-1.71)	(-1.87)
Flows(-1)	515.95	27.37
	(1.10)	(0.18)
Flows(-2)	-1108.67	41.42
	(-2.52)	(0.29)
R^2	0.12	0.04
R^2 (adjusted)	0.10	0.01
Durbin-Watson	1.87	1.85
Taiwan 6/94-6/2001	**(I)**	**(I)**
Constant	-0.57	-0.12
	(-0.41)	(-0.12)
Flows(0)	123.49	143.79
	(0.10)	(0.12)
Flows(-1)	931.40	-134.05
	(0.59)	(-0.10)
Flows(-2)	1195.36	-183.13
	(0.88)	(-0.15)
R^2	0.06	0.00
R^2 (adjusted)	0.01	-0.04
Durbin-Watson	2.01	1.90

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Appendix 1 – Table I cont/. – Results of Regressions on Returns of Value and Growth Portfolios against Change in US Net Portfolio Flows (excluding MA terms)

	VALUE	GROWTH
Thailand 6/93-6/2001	**(I)**	**(I)**
Constant	1.93	-0.71
	(1.53)	(-0.72)
Flows(0)	821.68	1864.86
	(0.74)	(2.13)
Flows(-1)	3565.07	3480.56
	(2.79)	(3.46)
Flows(-2)	1446.97	1327.27
	(1.35)	(1.58)
R^2	0.09	0.12
R^2 (adjusted)	0.06	0.09
Durbin-Watson	1.65	1.80

Notes for Table I

Value (stocks in fractile 1) and growth (stocks in fractile 3) portfolios are formed on P/B. Firms are weighted equally within each portfolio. Row 1 contains the value of Constant whilst Rows 2-4 contain values of coefficients of variables used in Regression (Model I). The second row for each country contain the value of the coefficient on contemporaneous portfolio flows, denoted by Flows(0). The third and fourth rows for each country contain the values of the coefficients on the first lag and second lag of portfolio flows, denoted by Flows(-1) and Flows(-2) respectively. T-statistics of the coefficients of the variables are in (parentheses). Rows 5-6 show the values of R^2 and R^2 (adjusted) which represent the percentage of the explanatory power of the independent variables behind the variability of portfolio returns. The last row shows the value of Durbin-Watson that measures first-order serial correlation in the residuals of the regressions. The Durbin Watson value for all the countries is around 2 showing there is no existence of serial correlation.

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Appendix 2 – Table I – Average Earnings Forecast Errors for Value and Growth Portfolios

Portfolio	Forecast Errors I	Forecast Errors II	Forecast Errors III	Forecast Errors IV
Hong Kong V	-0.33	-0.18	-0.82	-0.04
Hong Kong G	-0.11	-0.06	-0.56	-0.01
Indonesia V	-0.89	-1.21	-3.25	-0.47
Indonesia G	-0.32	-0.14	-1.35	-0.01
Japan V	-0.48	-0.52	-1.81	-0.01
Japan G	-0.30	-0.16	-1.08	-0.00
Korea V	-0.66	-0.60	-1.85	-0.05
Korea G	-0.33	-0.13	-0.74	-0.01
Malaysia V	-0.41	-0.29	-0.67	-0.03
Malaysia G	-0.13	-0.03	-0.23	-0.00
Philippines V	-1.04	-1.92	-2.67	-0.18
Philippines G	-0.24	-0.09	-0.69	-0.01
Singapore V	-0.44	-0.22	-1.02	-0.01
Singapore G	-0.14	-0.07	-0.52	-0.01
Taiwan V	-1.13	-0.53	-1.41	-0.03
Taiwan G	-0.17	-0.04	-0.24	-0.00
Thailand V	-0.51	-1.00	-2.62	-0.18
Thailand G	-0.38	-0.33	-1.90	-0.03

Notes for Table I

The data consists of all companies that have an EPS consensus forecast produced by at least 3 analysts. The data is also trimmed to eliminate suspect data and outliers. All companies with forecast errors below the 5th percentile value and above the 95th percentile value are removed from our sample.

Value (stocks in fractile 1) and growth (stocks in fractile 3) portfolios are formed on P/B. Firms are weighted equally within each portfolio. V denotes value portfolio while G denotes growth portfolio. The average forecast errors are defined using 4 different metrics: forecast errors as a percentage over actual EPS denoted by Forecast Errors I, forecast errors as a percentage over forecast EPS denoted by Forecast Errors II, forecast errors as a percentage over standard deviation of analysts' forecasts denoted by Forecast Errors III and forecast errors as a percentage over share price denoted by Forecast Errors IV.

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Appendix 2 – Table II – Distribution of Earnings Forecast Errors for Value and Growth Portfolios

Country	Value	Growth
Hong Kong		
Average Forecast Errors I	-0.33	-0.11
No of Positive Forecast Error	70 (33%)	207 (43%)
No of Negative Forecast Error	143 (67%)	275 (57%)
Indonesia		
Average Forecast Errors I	-0.89	-0.32
No of Positive Forecast Error	14 (22%)	71 (45%)
No of Negative Forecast Error	50 (78%)	87 (55%)
Japan		
Average Forecast Errors I	-0.48	-0.30
No of Positive Forecast Error	207 (27%)	699 (39%)
No of Negative Forecast Error	566 (73%)	1079 (61%)
Korea		
Average Forecast Errors I	-0.66	-0.33
No of Positive Forecast Error	44 (34%)	38 (38%)
No of Negative Forecast Error	86 (66%)	61 (62%)
Malaysia		
Average Forecast Errors I	-0.41	-0.13
No of Positive Forecast Error	86 (41%)	163 (47%)
No of Negative Forecast Error	123 (59%)	181 (53%)
Philippines		
Average Forecast Errors I	-1.04	-0.24
No of Positive Forecast Error	9 (18%)	55 (43%)
No of Negative Forecast Error	40 (82%)	72 (57%)
Singapore		
Average Forecast Errors I	-0.44	-0.14
No of Positive Forecast Error	72 (33%)	117 (42%)
No of Negative Forecast Error	147 (67%)	160 (58%)
Taiwan		
Average Forecast Errors I	-1.13	-0.17
No of Positive Forecast Error	29 (27%)	100 (45%)
No of Negative Forecast Error	80 (73%)	121 (55%)
Thailand		
Average Forecast Errors I	-0.51	-0.38
No of Positive Forecast Error	18 (29%)	87 (35%)
No of Negative Forecast Error	45 (71%)	165 (65%)

Notes for Table II

The data consists of all companies that have an EPS consensus forecast produced by at least 3 analysts. The data is also trimmed to eliminate suspect data and outliers. All companies with forecast errors below the 5th percentile value and above the 95th percentile value are removed from our sample.

Value (stocks in fractile 1) and growth (stocks in fractile 3) portfolios are formed on P/B. Firms are weighted equally within each portfolio. The first row for each country is the Average Forecast Error I that is defined as forecast error as a percentage of actual EPS. The second and third rows contain number of positive and number of negative forecast errors respectively as well as percentage over total in (parentheses).

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Appendix 2 – Table III – Impact of Positive Forecast Errors I on the Returns of Value and Growth Portfolios

	VALUE		GROWTH	
Independent Variables	**(I)**	**(II)**	**(I)**	**(II)**
Constant	-0.07	-0.09	-0.03	-0.04
	(-4.12)	(-6.47)	(-3.18)	(-3.80)
Forecast Errors (+)	0.47	0.64	0.38	0.40
	(5.18)	(7.63)	(9.16)	(10.41)
Expected(0)		0.28		0.62
		(0.40)		(1.92)
Unexpected (0)		2.98		1.28
		(4.07)		(4.81)
R^2	0.09	0.17	0.07	0.09
R^2 (adjusted)		0.13		0.05

Appendix 2 – Table IV – Impact of Negative Forecast Errors I on the Returns of Value and Growth Portfolios

	VALUE		GROWTH	
Independent Variables	**(I)**	**(II)**	**(I)**	**(II)**
Constant	0.02	0.01	0.01	-0.01
	(2.18)	(0.56)	(0.60)	(-1.23)
Forecast Errors (-)	0.03	0.02	0.06	0.03
	(2.44)	(1.58)	(2.96)	(1.74)
Expected (0)		1.08		0.27
		(2.46)		(1.03)
Unexpected (0)		1.99		1.21
		(5.65)		(5.51)
R^2	0.01	0.05	0.00	0.04
R^2 (adjusted)		0.01		0.00

Notes for Table III & IV

Value and growth portfolios are formed on P/B and according to the sign of analysts' forecasts. Firms are weighted equally within each portfolio. We make use of data that consists of all companies that have an EPS consensus forecast produced at least by 3 analysts to increase the breadth of companies with large as well as small capitalization stocks in our sample universe. All companies with forecast errors below the 5th percentile value and above the 95th percentile value are removed from our sample. Row 1 contains the value of Constant. The second row contains the values of the coefficients on Forecast Errors I used as a standalone variable in Regression (Model I) and in combination with portfolio flows as independent variables in Regression (Model II). The third and fourth rows contain the values of the coefficients on expected and unexpected contemporaneous portfolio flows used in Regression (Model II), denoted by Expected(0)) and Unexpected (0) respectively. T-statistics of the coefficients of the variables are in (parentheses). Rows 5-6 show the values of of R^2 and R^2 (adjusted) which represent the percentage of the explanatory power of the independent variables behind the variability of portfolio returns.

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Chapter 8
Conclusions and Suggestions for Further Research

Chapter 8 – Conclusions and Suggestions for Further Research

8.1 Main Findings and Conclusions

This thesis determines whether style investment strategies can be applied consistently in the Asian Equity Markets both developed Asia (Japan, Hong Kong, Singapore) and markets in emerging Asia (Indonesia, Korea, Malaysia, Philippines, Taiwan and Thailand). We investigated the significance of the theoretical drivers of the valuation ratios used as proxies for classifying value and growth stocks. We then devised a style investment strategy for Asian Markets using a combination of the theoretical drivers to test whether it is a better predictor of future returns compared to an investment strategy which uses traditional single factor valuation ratios. We also shed light on the explanations behind the value/growth effect.

We have investigated and tested several hypotheses against market practice and the results of other academic studies.The findings and conclusions from the research are summarized as follows:

Our findings show that stock returns in the Asian Equity Markets are predictable. Value stocks consistently outperform growth stocks over the sample period. There is a significant cross-sectional relationship between the commonly used valuation ratios (such as P/B, P/E, P/CF, P/Sales and P/D) and stock returns in the Asian Equity Markets despite the peculiarities in the Asian markets caused by differences in institutional and behavioural factors. The performance of the price-to-earnings ratio is especially noteworthy. The P/E ratio is statistically and economically the most important of the five ratios investigated. Our results are in contrast to earlier academic studies such as Fama and French (1998) and Chan, Hamao and Lakonishok (1991) conducted on both developed and emerging Asian markets which show P/B ratio as having the most significant and consistent impact on expected stock returns. This highlights that there is no guarantee that relationships uncovered from historical data will prevail in the future as markets and their institutional frameworks undergo structural changes.

Our study reveals that both valuation ratios and firm size are key determinants in explaining the cross-sectional average stock returns in the Asian Equity Markets. When size is controlled, we observe that both P/B and P/E capture substantial variation in cross-section of average stock returns in the Asian Equity Markets. We also notice relationships to size within each P/B and P/E group. Whilst Basu (1983) showed that size effect disappeared when returns were controlled for differences in P/E ratios; our results show that the effect of firm size remains important alongside both P/B and P/E ratios.

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An interesting observation is that our results do not support the Fama and French (1995, 1996) risk based argument behind the superior performance of value strategies. Firstly, our results provide evidence that value strategies in Asian Equity Markets earn higher risk adjusted returns compared to growth strategies. If a value strategy is indeed fundamentally riskier as postulated by Fama and French, then it should underperform relative to a growth strategy during bear periods in the stock market when marginal utility of wealth is at its peak. Instead, our results show that value stocks consistently outperform growth stocks at a frequency of more than 50% of the months observed.
Closer examination shows that a positive value-growth spread is skewed towards periods when the stock market performance is negative. The frequency of positive value-growth spreads during periods of stock market decline is higher than the frequency observed during periods of positive performance of the stock market. Moreover, we also observe that the outperformance of value stocks over growth stocks is more pronounced during the Asian crisis. Although value stocks were negatively affected during the Asian crisis, value stocks recovered dramatically compared to growth stocks. This is noted for companies with sound fundamentals supported by certainty in earnings, cashflow and dividend payments which do not justify their extreme low valuations exacerbated by the negative sentiment during the crisis. Our results are consistent with the conclusions of Lakonishok, Shleifer and Vishny (1994) which show that the outperformance of value stocks is more pronounced during the down-market months of the stock market.

We notice that a combination of variables - company fundamentals (ROE, net profit margin, payout ratio), expectations of growth and stock specific risks (beta, net debt-to-equity ratio); all have joint roles in explaining the variability of P/B, P/E, P/Sales and P/D (proxies for value and growth stocks). However, some variables are the 'first' among equals in explaining the variability. We observe ROE, net profit margin and payout ratio as the most important determinant of P/B, P/Sales and P/E respectively. However, we are not able to show the prominent role of any single theoretical variable in explaining the variability of P/D. We also observe that the cross-sectional explanatory power of the theoretical drivers vary across countries and time periods.

The prominent roles of some of the theoretical drivers help provide some plausible explanations behind the use of single proxy variables used in classifying value and growth stocks. The coefficients of ROE and net profit margin derived from the regressions have positive values. In an efficient market, it would not be surprising to find stocks with high ROEs and net profit margins trading at high P/B and P/Sales multiples as corporate fundamentals and corporate growth prospects drive stock prices. ROE and net profit margin as the most important determinant of P/B and P/Sales respectively provide reasoning behind the use of high P/B and P/Sales multiples for classifying growth stocks. Similarly, the coefficients of payout ratio derived from the regressions against P/E as dependent variable have positive values. This implies that P/E of a firm is an increasing function of payout ratio of a firm. One can understand the logic used by academics and practitioners in classifying low P/E stocks as value stocks – by definition low P/E multiple of a firm has low payout ratio but has the capacity of providing further growth in dividend payments as the company grows in the foreseeable future. Corporate fundamentals are reflected in a firm's payout ratio and hence its dividend growth. Moreover, dividends represent the most direct measure of cashflow to a shareholder.

The contribution to the variability of proxies differ using theoretical drivers based on historical data or a mix of historical and forecast data. We find that Model C which is based on historical data is the most preferred model in explaining the variability of P/B, P/E, P/Sales and P/D. This suggests that the market expectations of the future, as reflected in the current valuation multiples, are based on extrapolation of the past.

There is a challenging debate on whether these traditional single factor valuation ratios, which are influenced by the 'Price' factor, contain systematic errors. This may prevent these ratios from reflecting the true growth prospects of companies and thus the underlying intrinsic valuations of companies. This therefore raises the question whether they are valid ratios for screening value and growth stocks.

We therefore analyse a style investment strategy using a combination of theoretical drivers based on historical data or a mix of historical and forecast data. We notice interesting results when we compare the results to a traditional investment strategy which uses single factor valuation ratios.

Our results show that growth investment strategies based on the theoretical drivers using a combination of historical and forecast data (Model A) exceed the performance of growth strategies using respective single factor valuation ratio (P/B, P/E, P/Sales or P/D) both on an absolute and risk adjusted basis. Our investment strategy is driven by fundamental drivers whereas single factor valuation ratios are influenced by the 'Price' factor.
The 'Price' factor is driven by market expectations and investor behaviour which may be overly optimistic or pessimistic. Single factor valuation ratios for growth stocks, influenced by the 'Price' factor, consist of high expectations which drive valuation multiples higher as investors chase up these stocks. As a consequence, our investment strategy based on theoretical drivers (Model A) provides a realistic valuation of growth firms (without being influenced to a large extent by subjective judgement).

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Our investment strategies using the theoretical drivers outperform both the MSCI and Citigroup Growth Indices.

However, we not able to make similar conclusions for value strategies based on the theoretical drivers. Value strategies based on theoretical drivers (Model C) show only broadly comparable performance against value portfolios selected using counterpart single factor variables. However, our investment strategies outperform both the MSCI and Citigroup Value Indices.

We find that our investment strategies based on theoretical drivers for both value and growth stocks have expanded the distinction between growth and value beyond that of the industry norm of defining such stocks based on 'expensive' and 'cheap' definitions.

We further show that "P/S" and "P/B" Composite portfolios show the highest performance across growth portfolios while "P/E" Composite portfolio show the highest performance across value portfolios in our sample universe. The results have significant implications in the way a fund manager devises active strategies to optimize returns against style benchmarks in the Asian markets as well as peers within the industry. Most managers have limited time and resources to select attractive stocks for further research. They usually rely on stock ideas proposed by analysts from Investment Brokerage Houses or use single proxy variables such as P/B or P/E to screen value and growth stocks. These traditional methods do not give fund managers any competitive advantage over their peers.
Our results show that a fund manager could gain significant competitive advantage by deploying an automated screening tool using fundamental drivers defined in "P/B", "P/Sales" or "P/E" Composite Ratios to screen attractive stock selection ideas.

We also investigate the reasons for the existence of 'value-growth premiums'. As our results do not support Fama and French's risk-based argument behind the explanation of the superior performance of value strategies, we determine whether expectational error explains the superior performance of value strategies. There may be many different sources of expectational error which range from investors and analysts extrapolating past earnings/sales growth too far into the future, to reliance on analysts' earnings forecasts, to portfolio flows or various cognitive errors/research biases. To date, there has not been a consensus on the sources of extreme expectations.

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Our thesis determines whether extreme expectations driven by extrapolation of past performance as suggested by Lakonishok, et al (1994) and Debondt, et al (1985, 1987) explain the superior performance of value strategies. Although preliminary evidence shows mean-reversion patterns in price performance and earnings growth for both value and growth portfolios, further statistical tests are not consistent with the view that the source of extreme expectations by investors is driven by extrapolation of past performance. The results of the t-statistics show that the difference in performance between prior 'losers' (stocks with low past growth or price performance) and prior 'winners' (stocks with high past growth or price performance) within the same value or growth portfolio segments (based on P/B, P/E and P/Sales) are not statistically significant; inconsistent with the extrapolation error theory. According to the extrapolation error theory, as noted by Lakonishok, Shleifer and Vishny (1994), if the market extrapolates the past and overreacts to previous earnings growth (or historical price performance), the returns of stocks with low past earnings growth (or low historical price performance) would have been significantly higher than the returns of stocks with high past earnings growth (or high historical price performance) for both the value and growth portfolios.

As our results do not provide statistically conclusive evidence that mispricing is caused by investors influenced by past performance to be able to explain the value/growth effect, we therefore proceed to examine the impact of net foreign portfolio flows and analysts' forecast errors on the performance of value and growth stocks.

Using time series regressions on the performance of value and growth portfolios against contemporaneous and lagged portfolio flows, we observe a positive relationship between contemporaneous portfolio flows and returns for both value and growth portfolios consistent with the findings of Warther (1995) and Levis and Thomas (1999).
There appears to be a lack of evidence in the relationship between lagged portfolio flows and returns indicating that information about future inflows are contained in contemporaneous portfolio flows. We then extend the investigation further to determine whether returns of value and growth stocks are related to the unexpected component of the contemporaneous portfolio flows. The results show that the positive relationship between value and growth returns and contemporaneous portfolio flows is driven by the unexpected component of contemporaneous portfolio flows. However, we find that the relationship between unexpected contemporaneous portfolio flows and returns is similar for both value and growth portfolios. Thus, portfolio flows has not been able to differentiate the performance between value and growth portfolios.

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We next analyse the impact of analysts' forecast errors on the performance of value and growth stocks. Empirical evidence shows that forecast errors are on average more negative for value portfolios than the corresponding growth portfolios. This indicates that analysts are on average more optimistic on growth expectations of value stocks compared to growth stocks in the Asian Equity Markets. Further analysis also show that analysts are on average more optimistic on growth expectations of value stocks compared to growth stocks during the Asian crisis period. This suggests that analysts failed to incorporate negative information during the crisis period and therefore exhibit systematic biases in forming their expectations during periods of heightened economic uncertainty..

We thus find that positive forecast errors on a standalone basis does not have a significant impact on the returns of value stocks while having a bigger and significant impact on the performance of growth stocks. Moreover, we find that growth portfolios have a positive but only marginally significant coefficient against negative forecast errors. This is inconsistent with the expectational error theory which postulates that positive forecast errors for value stocks have significantly more positive impact on their returns compared to growth stocks. On the other hand, negative forecast errors have significantly more negative impact on their performance with only marginal impact on the performance of value stocks.

The role of forecast errors, in explaining the performance of value and growth stocks, changes when used in combination with net foreign flows compared to its role on a standalone basis.

When we use positive forecast errors in combination with expected and unexpected contemporaneous flows, we find that the coefficient on positive forecast errors against the performance of value portfolio appears positive and significant compared to being insignificant when used on a standalone basis. The use of a combination of positive forecast errors and flows explain 12% of the performance of value stocks. Moreover, we find that a combination of positive forecast errors and flows explain only 4% of the performance of growth stocks. This highlights that a combination of positive forecast errors and expected/unexpected contemporaneous flows plays a better role in explaining the performance of value stocks compared to growth stocks.

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The explanatory role of a combination of negative forecast errors and flows appears relatively insignificant on the performance of both value and growth stocks. The results conclude that the performance of value and growth stocks in the Asian Equity Markets is driven by a combination of positive forecast errors and contemporaneous flows (primarily unexpected flows). But the use of a combination of positive forecast errors and contemporaneous flows plays a better role in explaining the performance of value stocks than growth stocks in the Asian Equity Markets.

A deeper understanding of the interpretation of the variation of returns for value and growth strategies, enables a fund manager to better implement active style strategies. We know that a combination of contemporaneous flows and positive forecast errors play a role in the superior performance of value strategies. A value based fund manager can then devise a stock selection strategy that is contrarian to strategies driven by analyst's forecasts whilst simultaneously timing investment decisions by monitoring portfolio flows.

8.2 Limitations and Suggestions for Further Research

The conclusions of this thesis rely on empirical findings and are subject to several limitations in terms of research design and methodology. The thesis also raises questions and areas for further research.

Our findings in Chapter 4 show a significant cross-sectional relationship between valuation ratios and stock returns in the Asian Equity Markets. However, the performance of P/E is especially noteworthy as it is statistically and economically the most important of the five ratios investigated. Interesting research questions are: 'What differentiates P/E ratio from the other ratios? Why are our results in contrast to earlier academic studies which show P/B ratio as having the most significant and consistent impact on expected stock returns in Asian markets?'

Chapter 5 attempts to understand the drivers behind the valuation ratios that are used as proxies for classifying value and growth stocks. There are several limitations in our methodology. We assume expectations of growth rate of dividends to be similar to expectations of growth rate in earnings. In the long term, the growth rate of dividends does correlate to the long term growth rate in earnings. However, in the short-term this may not be the case. We also assume that expectation of growth rate in earnings can be estimated from past growth as well as consensus estimates made by analysts. There is a connection between past growth rates and expected future growth rates but the reliability is open to question. Moreover, using growth rate from the past as predicted growth rates for the future is sensitive to the starting and ending periods of estimation. Besides, it is difficult to judge how far back in history investors go to predict future growth rates.

There are also limitations in our methodology in Chapter 5 using analysts' consensus earnings growth forecasts in its raw form as we do not take into consideration the number of analysts or the quality of analysts following the stock. But it is difficult to determine the quality of consensus estimates by just relying on the number of analysts covering the stock. There may be 'herd behaviour' amongst analysts in following a particular lead analyst. Our studies is restricted to using IBES consensus FY1 earnings growth rate as IBES long term growth forecasts are not widely available for the companies in the Asian markets. Perhaps, the studies can be extended to include a third Model D which uses a composite growth rate based on a blend of past as well as long-term and short-term forecast growth rates. We also associate the discount rate with risk which is intuitively correct but we restricted our risk definition to correspond with only beta and net debt-to-equity ratio. It is possible that we may be missing out on a number of variables contributing to the variability of the proxies which are therefore omitted in the multi-factor composite valuation criteria based on the drivers.

Chapter 6 tests the role of expectational error due to extrapolation of past performance in explaining the superior performance of value strategies. The inherent limitation in the methodology, used to test the extrapolation theory, is that there is an uncertainty in the appropriate timeframe for return-reversal tests.

Value strategies have long cycles and it is difficult to make an assumption as to when return reversals occur. Moreover, most studies including ours use past earnings/sales growth or historical price performance to test the implication of extrapolation hypothesis. Most value investors value the stream of dividend payments which provide defensive characteristics with protection on the downside during down-market periods whilst capturing upside performance in up-market periods. After all, corporate fundamentals are reflected in a firm's dividend growth. There is scope to conduct further research to determine whether extrapolation of past dividends growth is able to explain the value/growth effect.

Chapter 7 investigates the impact of portfolio flows and analysts' forecast errors on the performance of value and growth stocks. We like to highlight some limitations of using US net portfolio flows. We make use of net foreign portfolio flows to determine the relationship between flows and stock returns as a large number of Asian Equity markets in our sample universe tend to be dominated by foreign portfolio flows because the domestic institutional and retail markets are relatively small.

Chapter 8 – Conclusions and Suggestions for Further Research

However, as discussed, not every local stock exchange reports data on foreign portfolio flows which lead us to use US net portfolio flows as a proxy for foreign portfolio flows. We find that Bekaert and Harvey (2002) and Bekaert, Harvey and Lumsdaine (2003) made use of similar data as proxy for net foreign portfolio flows in their research Although preliminary studies show that US net portfolio flows account for 35% of aggregate net foreign flows into Indonesia, Philippines and Taiwan and more than 50% of aggregate net foreign flows into Korea during the period 1992-2000, we appreciate that US net portfolio flows may not provide the complete measure of foreign portfolio flows into each market as US net portfolio flows may dominate foreign portfolio flows into some markets or time periods and less so in other markets or time periods. Our results show that the relationship between aggregate US net portfolio flows and returns is similar for both value and growth portfolios and is unable to explain the differences in performance between value and growth portfolios. It would be interesting to conduct further research using total flows at the firm level which is driven by investor sentiment at the stock level instead of the aggregate flows into a market.

Further, results in Chapter 7 show that when we use positive forecast errors in combination with expected and unexpected contemporaneous portfolio flows, we find that the coefficient on positive forecast errors against the performance of value portfolio appears significant compared to being insignificant when positive forecast errors is used on a standalone basis. Both portfolio flows and positive forecast errors are jointly significant. The results raise the question whether portfolio flows are acting as 'instruments' for the forecast errors or vice versa. There is scope to extend research on the link between portfolio flows and analysts' forecasts – whether portfolio flows influence analysts driving further optimism in their forecasts or optimistic forecasts drive portfolio flows.

Empirical evidence in Chapter 7 show that analysts are generally optimistic in their forecasts for both value and growth stocks. Our research still leaves an unanswered question – 'Why analysts' forecasts are systematically overoptimistic – is this due to behavioural or institutional factors?' It would also be interesting to conduct research on the short-term effect of returns immediately after the realization of the forecast errors. An event study which looks at returns around earnings announcement is likely to provide an insight towards assessing the reaction of returns of value and growth portfolios to positive and negative forecast errors around earnings announcement. The extent of such information is helpful in timing and implementing active style portfolios.

The above issues raised provide background on the limitations to our research and directions for further research.

Bibliography

Bibliography

A

Achour Dana, Campbell R. Harvey, Greg Hopkins and Clive Lang, 1998,
Stock Selection in Malaysia, Research jointly conducted at Duke University and Merrill Lynch,

Ang J.S. & Y. Ma, 2001,
The Behaviour of Financial Analysts during the Asian Financial Crisis in Indonesia, Korea, Malaysia & Thailand, Pacific-Basin Finance Journal Vol.9 No.3 June, 233-263

Arshanapalli Bala, Daniel T. Coggin and John Douka, 1997,
Multifactor Asset Pricing Analysis of International Value Investment Strategies, Journal of Portfolio Management Summer, 10-23

Attari Mukarram, Antonio S. Mello & Martin E. Ruckes, 2005,
Arbitraging Arbitrageurs, Journal of Finance Vol.LX No5 October

B

Ball Ray & S.P. Kothari, 1991,
Security Returns Around Earnings Announcements, The Accounting Review Vol. 66 No. 4, 718-738

Ball Ray, S.P. Kothari and Jay Shanken, 1995,
Problems in Measuring Portfolio Performance. An Application to Contrarian Investment Strategies, Journal of Financial Economics 38, 79-107

Bandyopadhyay Sati P., Lawrence D. Brown & Gordon D. Richardson, 1995,
Analysts' Use of Earnings Forecasts in Predicting Stock Returns: Forecast Horizon Effects, International Journal of Forecasting II, 429-445

Banz Rolf W., 1981,
The Relationship Between Returns and Market Value of Common Stocks, Journal of Financial Economics 9, 3-19

Barbee William C. Jr, Sandip Mukherji & Gary A. Raines 1996,
Do Sales/Price & Debt Equity Explain Stock Returns Better than Book/Market & Firm Size, Financial Analysts Journal March/April, 56-60

Barber Brad M. & Terrance Odean, 1999,
The Courage of Misguided Convictions, Financial Analysts Journal November/December, 41-55

Barr Rosenberg, 1985,
Prediction of Common Stock Betas, Journal of Portfolio Management Winter, 5-14

Basci Erdem, Sidika Basci & Gulnur Muradoglu, 2001,
Do Extreme Falls Help Forecasting Stock Returns?, City University Business School Faculty of Finance Working Paper No.6 October

Basu Sanjoy, 1977,
Investment Performance of Common Stocks in Relation to their Price-Earnings Ratios: A Test of the Efficient Market Hypothesis, Journal of Finance Vol. XXXII No.3 June, 663-682

Basu Sanjoy, 1983,
The Relationship Between Earnings' Yield, Market Value and Return for NYSE Common Stock: Further Evidence, Journal of Financial Economics 12, 129-156

Bauman Scott W., 1989,
Investment Research Analysis in Emerging Market: Singapore & Malaysia, Financial Analysts Journal November/December, 60-67

Bauman Scott W., C. Mitchell Conover & Robert E. Miller, 1998,
Growth Versus Value and Large Cap Versus Small Cap Stocks in International Markets, Financial Analysts Journal Vol. 54 No.2 March/April, 75-89

Bauman Scott W. & Richard J. Dowen, 1994,
Security Analyst Forecasts & the Earnings Yield Anomaly, Journal of Business Finance & Accounting 21 No.2 March, 283-291

Bibliography

Bhandari Laxmi Chand, 1988,

Debt/Equity Ratio and Expected Common Stock Returns: Empirical Evidence,

Journal of Finance Vol. XLIII No.2 June, 507-528

Becker Gary S., 1976,

The Economic Approach to Human Behaviour, Chicago University of Chicago Press

Becker Gary S., 1993,

Nobel Lecture: The Economic Way of Looking at Behaviour, Journal of Political Economics June, 385-409

Beckers Stan, Michael Stellaros & Alexander Thomson, 2004,

Bias in European Analysts' Earnings Forecasts, Financial Analysts Journal, Vol. 60 No.2 March/April, 74-85

Benartzi Shlomo, Roni Michaely & Richard Thaler, 1997,

Do Changes in Dividends Signal the Future or the Past? Journal of Finance Vol. LII No.3 July, 1007-1033

Bekaert Geert & Campbell R. Harvey, 1995,

Capital Markets: An Engine For Economic Growth, A Catalyst Institute Research Project,1-45

Bekaert Geert, Claude B. Erb, Campbell R. Harvey & Tadas E. Viskanta, 1996,

The Behaviour of Emerging Markets, Conference Presentation at New York University

Bekaert Geert, Claude B. Erb, Campbell R. Harvey & Tadas E. Viskanta, 1997,

What Matters for Emerging Equity Market Investments, Emerging Markets Quarterly

Bekaert Geert, Claude B. Erb, Campbell R. Harvey & Tadas E. Viskanta,

The Cross-Sectional Determinants of Emerging Equity Market Returns

Bekaert Geert & Campbell R. Harvey, 1997,

Emerging Equity Market Volatility, Journal of Financial Economists 43, 29-77

Bekaert Geert & Campbell R. Harvey, 2000,

Foreign Speculators and Emerging Equity Markets, Journal of Finance Vol.55 No.2 April, 565-613

Bekaert Geert & Campbell R. Harvey, 2001,

Economic Growth and Financial Liberalisation, Draft Paper

Bekaert Geert & Campbell R. Harvey,

Capital Flows & the Behavior of Emerging Market Equity Returns

Bekaert Geert & Campbell R. Harvey, 2003,

Emerging Markets Finance, Journal of Empirical Finance 10, 3-55

Bekaert Geert, Campbell R. Harvey & Angela Ng, 2002,

Market Integration and Contagion, 1-31

Bekaert Geert, Campbell R. Harvey & Christian Lundblad, 2003,

Liquidity & Expected Returns: Lessons from Emerging Markets

Bekaert Geert, Campbell R. Harvey & R.L. Lumsdaine, 2002,

The Dynamics of Emerging Market Equity Flows, Journal of International Money & Finance 21 295-350

Bennett James A., Richard W. Sias, 2001,

Can Money Flows Predict Stock Returns? Financial Analysts Journal November/December, 64-77

Bercel Anthony, 1994,

Consensus Expectations and International Equity Returns, Financial Analysts Journal July/August, 76-80

Berk Jonathan B., 1995,

A Critique of Size Related Anomalies, Review of Financial Studies Vol. 8 No. 2, 275-286

Berk Jonathan B., 1997,

Does Size Really Matter? Financial Analysts Journal September/October, 12-18

Bibliography

Berk Jonathan B., 2001,

Sorting Out Sorts Journal of Finance Vol.55 No.1 February, 407-427

Berk Jonathan B., 2005,

Five Myths of Active Portfolio Management Journal of Portfolio Management Spring

Blume Marshall E. & Robert F. Stambaugh, 1983,

Biases in Computed Returns: An Application to the Size Effect, Journal of Financial Economics 12, 387-404

Bonser-Neal Catherine, Greggory Brauer, Robert Neal & Simon Wheatley, 1990,

International Investment Restrictions and Closed-End Country Fund Prices, Journal of Finance, Vol. XLV No.2, 523-548

Bourguignon Francois & Marielle de Jong, 2003,

Value Versus Growth, Journal of Portfolio Management Summer, 71-79

Brav Alon, John R. Graham, Campbell R. Harvey & Roni Michaely, 2004,

Payout Policy in the 21st Century, Sponsored by Financial Executives International

Brown Lawrence D., 1997,

Earnings Surprise Research: Synthesis & Perspectives, Financial Analysts Journal March/April, 13-19

Brown Gregory W., 1999,

Volatility, Sentiment and Noise Traders, Financial Analysts Journal March/April, 82-90

Brouwer Iwan, Jeroen van Der Put & Chris Veld, 1997,

Contrarian Investment Strategies in a European Context, Journal of Business Finance & Accounting, 24 No. 9/10, October & December, 1353-1366

C

Cai Jun, 1997,

Glamour and Value Strategies on the Tokyo Stock Exchange, Journal of Business Finance & Accounting, Vol 24 No. 9/10 October & December, 1291-1310

Campbell John Y., 1990

Measuring the Persistence of Expected Returns, The American Economic Review Vol. 80 No.2 May, 43-47

Campbell John Y., Albert S. Kyle, 1993,

Smart Money, Noise Trading & Stock Price Behaviour, The Review of Economic Studies Vol. 60 No.1 January, 1-34

Campbell John Y., Andrew W. Lo & Craig A. MacKinlay, 1997,

The Econometrics of Financial Markets, Princeton University Press, Princeton New Jersey

Campbell John Y. & John H. Cochrane, 1999,

By Force of Habit: A Consumption-Based Explanation of Aggregate Stock Market Behaviour, Journal of Political Economy Vol. 107 No.2 April, 205-251

Campbell John Y. & Mei Jianping, 1993,

Where do Betas Come From? Asset Price Dynamics & the Sources of Systematic Risk, Review of Financial Studies Vol. 6 No.3 , 567-592

Campbell John Y. & Robert Shiller, 1988,

The Dividend Price Ratio and Expectations of Future Dividends and Discount Factors, Review of Financial Studies Vol. 1 No.3 Autumn, 195-228

Campbell Rachel, Kees Koedijk & Paul Kofman, 2002,

Increased Correlation in Bear Markets, Financial Analysts Journal January/February, 87-94

Capaul Carlo, Ian Rowley & William F. Sharpe, 1993,

International Value & Growth Stock Returns, Financial Analysts Journal Vol. 49 No.1 January-February, 27-36

Carhart Mark M., 1997,

On Persistence in Mutual Fund Performance Journal of Finance Vol.52 No.1 March , 57-82

Bibliography

Carlson John B., Eduard A. Pelz & Mark E. Wohar, 2002,

Will Valuation Ratios Revert to Historical Means? Journal of Portfolio Management Summer, 23-33

Chan K.C., 1988,

On the Contrarian Investment Strategy, Journal of Business 61, 147-163

Chan Louis K.C., Jason Karceski & Josef Lakonishok, 1998

The Risk and Return From Factors, Journal of Financial & Quantitative Analysis Vol. 33 No. 2 June, 159-188

Chan Louis K.C., Jason Karceski & Josef Lakonishok, 2000,

New Paradigm or Same Old Hype in Equity Investing, Financial Analysts Journal July/August, 23-37

Chan Louis K.C. & Josef Lakonishok, 1995,

The Behavior of Stock Prices Around Institutional Trades, Journal of Finance Vol. L No. 4 September, 1147-1174

Chan Louis K.C. & Josef Lakonishok, 2004,

Value and Growth Investing: Review and Update, Financial Analysts Journal January/February, 73-86

Chan K.C. & Nai Fu Chen, 1988,

An Unconditional Asset-Pricing Test and the Role of Firm Size as an Instrument Variable for Risk,

Journal of Finance 43, 309-325

Chan K.C. & Nai-Fu Chen, 1991,

Structural and Return Characteristics of Small and Large Firms, Journal of Finance Vol. XLVI No.4, 1467-1484

Chan K.C., Nai-Fu Chen & David Hsieh, 1985,

An Exploratory Investigation of the Firm Size Effect, Journal of Financial Economics 14, 451-471

Chan K.C., Narasimhan Jegadeesh & Josef Lakonishok, 1995,

Evaluating the Performance of Value versus Glamour Stocks: The Impact of Selection Bias,

Journal of Financial Economics 38, 269-296

Chan K.C., Narasimhan Jegadeesh & Josef Lakonishok, 1996,

Momentum Strategies, Journal of Finance Vol. LI No.5, 1681 -1713

Chan K.C., Narasimhan Jegadeesh & Josef Lakonishok, 1999,

The Profitability of Momentum Strategies, Financial Analysts Journal November/December, 80-90

Chan Louis K.C., Yasuhi Hamao & Josef Lakonishok, 1991,

Fundamentals & Stock Returns in Japan, Journal of Finance Vol. XLVI No.5 December, 1739-1764

Chan Louis K.C., Yasuhi Hamao & Josef Lakonishok, 1993

Can Fundamentals Predict Japanese Stock Returns? Financial Analysts Journal July-August, 63-69

Chan Siu Y. & Wai-Ming Fong 2004,

Individual Investors' Sentiment and Temporary Stock Price Pressure,

Journal of Business Finance & Accounting Vol.31 No.5/6 June, 823-836

Chen Nai-Fu, 1991,

Financial Investment Opportunities and the Macroeconomy, Journal of Finance Vol. XLIV No.2, 529-554

Chen Nai-Fu & Feng Zhang , 1998,

Risk & Return of Value Stocks, Journal of Business Vol. 71 No.4, 501-535

Chen Nai-Fu and Richard Roll and Stephen Ross, 1986,

Economic Forces and the Stock Market, Journal of Business 59, 383-403

Chopra Navin, Josef Lakonishok & Jay R. Ritter, 1992,

Do Stocks Overreact? Journal of Financial Economics 31, 235-268

Clarke Roger & Meir Statman, 1994,

Growth, Value, Good and Bad, Financial Analysts Journal Vol. 50 No.6, 82-86

Bibliography

Clement Michael B. & Senyo Tse, 2005,

Financial Analyst Characteristics and Herding Behavior in Forecasting, Journal of Finance Vol. LX No.1 February, 307-341

Cochrane John H., 1989,

The Sensitivity of Tests of the Intertemporal Allocation of Consumption to Near-Rational Alternatives,

American Economic Review 79(3), 319-337

Coggin Daniel T., 1998,

Long Term Memory in Equity Style indexes, Journal of Portfolio Management, 25 No. 2, 37-46

Cole Kevin, Helwege Jean & Laster David, 1996,

Stock Market Valuation Indicators: Is this Time Different? Financial Analysts Journal May/June, 56-64

Conlisk, John, 1980,

Costly Optimizers Versus Cheap Imitators Journal of Economic Behaviour September, 1(3) 275-293

Conlisk, John, 1983,

Competitive Aprroximation of a Cournot Market Review of Economic Studies 50(4) June, 597-607

Conlisk, John, 1989,

An Aggregate Model of Technical Change Quarterly Journal of Economics 104(4) November, 787-821

Conlisk, John, 1996,

Why Bounded Rationality? Journal of Economic Literature Vol. 34 No. 2 June, 669-700

Conrad Jennifer, Michael Cooper & Gautam Kaul, 2003,

Value versus Glamour, Journal of Finance Vol. 58 No. 5 October, 1969–1996

Conroy R.M. & R.S. Harris, 1995,

Analysts' Earnings Forecasts in Japan: Accuracy and Sell-Side Optimism,

Pacific-Basin Finance Journal Vol.3 No.4 December, 393-408

Cook Thomas J. & Michael Rozeff, 1984,

Size and Earnings/Price Ratio Anomalies: One Effect or Two? Journal of Financial and Quantitative Analysis Vol.19 No.4 December, 449-465

Corhay Albert, Gariel Hawawini & Pierre Michel, 1988,

The Pricing of Equity on the London Stock Exchange, Stock Market Anomalies, E Dimson, Cambridge University Press

Cottle Sidney, Murray Roger F., Black Frank E.,

Graham & Dodd's Security Analysis Fifth Edition

Coval Joshua D., & Shumway Tyler, 2005,

Do Behavioral Biases Affect Prices, Journal of Finance Vol.60 No.1 February, 1-34

D

Daniel Kent & Sheridan Titman, 1997,

Evidence on the Characteristics of Cross Sectional Variation in Stock Returns, Journal of Finance 52, 1-33

Daniel Kent & Sheridan Titman, 1999,

Market Efficiency in an Irrational World, Financial Analysts Journal November/December, 28-40

Daniel Kent, Sheridan Titman & K.C. John Wei, 1999,

Explaining the Cross-Section of Stock Returns in Japan: Factors or Characteristics?

Journal of Finance, Vol. LVI No.2 April, 743-766

Daniel Kent, David Hirshleifer, Avanidhar Subrahmanyam 2001,

Overconfidence, Arbitrage & Equilibrium Asset Pricing

Journal of Finance, Vol. 56 No.3 June, 921-965

Damodaran Aswath, 1994,

Damodaran on Valuation, Security Analysis for Investment & Corporate Finance, John Wiley & Sons Inc.

Bibliography

Davis James L., Eugene F Fama & Kenneth R. French, 2000

Characteristics, Covariances & Average Returns:1929 to 1997, Journal of Finance Vol. 55 No.1 February, 389-406.

Dimson Elroy and Paul Marsh, 1994,

An Analysis of Brokers' & Analysts' Unpublished Forecasts of UK Stock Returns,

Journal of Finance Vol. 39 No.5 December, 1257-1292

Dimson Elroy and Paul Marsh, 1998,

Murphy's Law and Market Anomalies, London Business School IFA Working Paper 279

Dimson Elroy and Paul Marsh, 2004,

Hoare Govett Smaller Companies Index 2004, ABN Amro

Dimson Elroy, Paul Marsh & Mike Staunton, 2000,

The Millenium Book, A Century of Investment Returns, London Business School in Association with ABN Amro

Dimson Elroy, Paul Marsh & Mike Staunton, 2001,

The Millenium Book II, London Business School in association with ABN Amro

Dimson Elroy, Paul Marsh & Mike Staunton, 2003,

Global Investment Returns Yearbook 2003, London Business School with ABN Amro

Dimson Elroy, Paul Marsh & Mike Staunton, 2004,

Irrational Optimism, Financial Analysts Journal January/February, 15-25

Dimson Elroy, Paul Marsh & Mike Staunton, 2004,

Low-Cap and Low-Rated Companies, Journal of Portfolio Management, 1-12

Dimson Elroy, Stefan Nagel & Garrett Quigley, 2003,

Capturing the Value Premium in the United Kingdom, Financial Analysts Journal November/December, 35-45

Dirk Schiereck, Werner De Bondt & Martin Weber, 1999,

Contrarian and Momentum Strategies in Germany, Financial Analysts Journal November/December, 104-116

De Bondt Werner F.M., 1993,

Betting on Trends: Intuitive Forecasts of Financial Risk & Return, International Journal of Forecasting 9, 355-371

De Bondt Werner F.M. & Richard Thaler, 1985,

Does the Stock Market Overreact? Journal of Finance Vol. XL No.3 July, 793-807

De Bondt Werner F.M. & Richard Thaler, 1987,

Further Evidence on Investor Overreaction & Stock Market Seasonality, Journal of Finance Vol. XLII No.3 July, 557-581

Dechow Patricia M. & Richard G. Sloan Richard, 1997,

Returns to Contrarian Investment Strategies: Tests of Naïve Expectations Hypotheses,

Journal of Financial Economics 43, 3-27

Dhatt Manjeet S., Yong H. Kim, and Sandip Mukherji, 1999,

The Value Premium for Small-Capitalization Stocks, Financial Analysts Journal September/October, 60-68

Dowen Richard J. & Scott W. Bauman, 1986,

The Relative Importance of Size, P/E and Neglect, Journal of Portfolio Management Vol. 12 No.3, 30-35

Dreman David N. & Michael A. Berry , 1995,

Analyst Forecasting Errors & their Implications for Security Analysis, Financial Analysts Journal May-June, 30-41

Dreman David N. & Michael A. Berry , 1995,

Overreaction, Underreaction & the Low P/E Effect, Financial Analysts Journal Vol 51 No. 4 July/August, 21-30

Domowitz Ian, Jack Glen & Ananth Madhavan, 1997,

Market Segmentation and Stock Prices: Evidence from an Emerging Market, Journal of Finance Vol. LII No.3, 1059-1085

Bibliography

F

Fama Eugene F., 1965,
The Behavior of Stock Market Prices, Journal of Business 38, 34-105

Fama Eugene F., 1970,
Efficient Capital Markets: A Review of Theory and Empirical Work, Journal of Finance 25, 382-417

Fama Eugene F., 1981,
Stock Returns, Real Activity, Inflation and Money, American Economic Review 71, 545-565

Fama Eugene F., 1990,
Term Structure Forecasts of Interest Rates, Inflation and Real Returns, Journal of Monetary Economics 25, 59-76

Fama Eugene F., 1991,
Efficient Capital Markets II, Journal of Finance Vol. XLVI No.5, 1575-1617

Fama Eugene F., 1998,
Market Efficiency, long term returns and behavioural finance, Journal of Financial Economics 49, 283-306

Fama Eugene F. & James MacBeth, 1973,
Risk, Return and Equilibrium: Empirical Tests, Journal of Political Economy 81, 607-636

Fama Eugene F. & Kenneth R. French, 1989,
Business Conditions and Expected Returns on Stocks and Bonds, Journal of Financial Economics 21, 23-49

Fama Eugene F. & Kenneth R. French, 1992,
The Cross-section of Expected Stock Returns, Journal of Finance Vol. XLVII No. 2 June, 427-466

Fama Eugene F. & Kenneth R. French, 1993,
Common Risk Factors in the Returns on Stocks nad Bonds, Journal of Financial Economics 33, 3-56

Fama Eugene F. & Kenneth R. French, 1995,
Size & Book-to-Market Factors in Earnings & Returns, Journal of Finance Vol. L No.1 March, 131-155

Fama Eugene F. & Kenneth R. French, 1996,
Multifactor Explanations of Asset Pricing Anomalies, Journal of Finance Vol. LI No.1 March, 55-84

Fama Eugene F. & Kenneth R. French, 1998,
Value versus Growth: The International Evidence, Journal of Finance Vol. LIII No.6 December, 1975-1999

Fama Eugene F. & Kenneth R. French, 1993,
Differences in the Risks and Returns of NYSE and NASD Stocks, Financial Analysts Journal January/February, 37-41

Fama Eugene F. & Kenneth R. French, 1998,
Market Efficiency, Long Term Returns & Behavioral Finance, Journal of Financial Economics 49, 283-306

Fama Eugene F. & Kenneth R. French, 2000,
Forecasting Profitability & Earnings, Journal of Business Vol. 73 No.2 April, 161-175

Ferson Wayne E., & Campbell R. Harvey, 1999,
Conditioning Variables and the Cross-Section of Stock Returns, Journal of Finance Vol. LIV No.4, 1325-1360

Ferson Wayne E., & Robert A. Krajczyk, 1995,
Do Arbitrage Pricing Models Explain the Predictability of Stock Returns?, Journal of Business Vol. 68 No.3, 309-349

Finn Mark T., Russell J. Fuller, John L. King, 1999
Equity Mispricing: It's Mostly on the Short Side, Financial Analysts Journal November/December, 117-124

Fisher Kenneth L. & Meir Statman, 2000,
Investor Sentiment & Stock Returns, Financial Analysts Journal March/April, 16-23

Fitzpatrick Eileen, 2001,
Growth vs. Value – Which Way From Here, AIB Govett Inc

Bibliography

G

Garza-Gomez Xavier, 2001,

The information Content of the Book-Market Ratio, Financial Analysts Journal November/December, 78-95

Garza-Gomez Xavier, Jiro Hodoshima & Michio Kunimura, 1998,

Does Size Really Matter in Japan? Financial Analysts Journal November/December, 22-34

George Leledakis & Ian Davidson, 2001,

Are Two Factors Enough? The UK Evidence, Financial Analysts Journal November/December, 96-108

Griffin Paul A., 1976,

Competitive Information in the Stock Market: An Empirical Study of Earnings, Dividends and Analysts Forecasts, Journal of Finance Vol. XXXI No.2 May, 631-650

Grinold Richard C., 1994,

Alpha is Volatility Times IC Score, Journal of Portfolio Management, Vol.20 No.3, 9-15

Grinold Richard C. & Ronald Kahn, 1994,

Active Portfolio Management, McGraw-Hill

Gruber Martin J., Jeffrey A. Busse, 1998,

Do Investors Care About Sentiment? Journal of Business Vol. 71 No.4, 477-500

H

Harris Robert S. & Felicia C. Marston, 1994,

Value versus Growth Stocks: Book-to-Market, Growth & Beta, Financial Analysts Journal Vol.50 No.5 September/October, 18-24

Harvey Campbell R., 1993,

Predictable Risk and Returns in Emerging Markets, Working Paper, Duke University

Harvey Campbell R., 1994,

Conditional Asset Allocation in Emerging Markets, National Bureau of Economic Research March

Harvey Campbell R., 1995,

The Risk and Exposure of Emerging Equity Markets, The World Bank Economic Review Vol. 9 No.1 January

Harvey Campbell R., 1995,

The Cross-Section of Volatility and Autocorrelation in Emerging Markets, Finanzmarkt & Portfolio Management Vol. 9

Harvey Campbell R.,

Asset Pricing in Emerging Markets, Duke University & NBER

Harvey Campbell R.,

The Drivers of Expected Returns in International Markets, Duke University & NBER

Harvey Campbell R. & Andrew H. Roper, 1999,

The Asian Bet, National Bureau of Economic Research June

Harvey Campbell R., 2001,

International Cost of Capital and Risk Calculator (ICCRC), National Bureau of Economic Research

Hawawini Gabriel & Donald Keim, 1999,

The Cross-section of Common Stock Returns: A Synthesis of the Evidence and Explanations, in Keim, Donald and William Ziemba. Security imperfections in World Wide Equity markets, Cambridge University Press

Heiner Ronald A., 1983,

The Origin of Predictable Behaviour, American Economic Review September 73(4), 560-595

Heiner Ronald A., 1989,

The Origin of Predictable Dynamic Behaviour, Journal of Economic Behaviour October 12(2), 233-258

Ho Yiu-Wah, Roger Strange & Jenifer Piese, 2000,

CAPM Anomalies and the Pricing of Equity: Evidence for the Hong Kong Market, Journal of Applied Economics Vol. 32 No. 12 October, 1629-1636

Bibliography

Hunter John E., 1988,

Analyst Judgment: The Efficient Market Hypothesis versus a Psychological Theory of Human Judgment, Organizational Behavior & Human Decision Processes 42, 284-302

J

Jacques William E. & Rie Dan, 1994,

Valuation Factors Across Countries, The Handbook of Corporate Earnings Analysis, Probus Publishing, Chapter 25, 335-353

Jaffe Jeffrey, Keim Donald B. & Randolph Westerfield, 1989,

Earnings Yields, Market Values & Stock Returns, Journal of Finance Vol. XLIV No.1 March, 135-148

Jain Prem C., 1992,

Equity Issues and Changes in Expectations of Earnings by Financial Analysts Vol 5 No.4, 669-683

Jegadeesh Narasimhan, 1990,

Evidence of Predictable Behavior of Security Returns, Journal of Finance, Vol. XLV No.3 July, 881-898

Jegadeesh Narasimhan, 1992,

Does Market Risk Really Explain the Size Effect? Journal of Financial and Quantitative Analysis 27, 337-351

Jegadeesh Narasimhan & Sheridan Titman, 1993,

Returns to Buying Winners and Selling Losers: Implications for Stock Market Efficiency, Journal of Finance, Vol. XLVIII No.1, 65-91

Jegadeesh Narasimhan & Sheridan Titman, 1995,

Overreaction, Delayed Reaction and Contrarian Profits, Review of Financial Studies Vol. 8 No.4

Jegadeesh Narasimhan, Joonghyuk Kim, Susan D. Krische & Charles M.C. Lee, 2004,

Analyzing the Analysts: When Do Recommendations Add Value? Journal of Finance Vol. LIX No.3 June, 1083-1125

Jensen Gerald R.., Robert R. Johnson & Jeffrey M. Mercer, 1996,

Business Conditions, Monetary Policy and Expected Security Returns, Journal of Financial Economics 40, 213-237

Jensen Gerald R.., Robert R. Johnson & Jeffrey M. Mercer, 1997,

New Evidence on Size & Price-to-Book Effects in Stock Returns, Financial Analysts Journal November/December, 34-42

K

Kahn Ronald N. & Kristina Gedvila,

Modelling Analyst Behavior, Understanding Analysts' Behavior, Barclays Global Investors, 6-7

Kamesaka A., J.R. Nofsinger & H. Kawakita, 2003,

Investment Patterns and Performance of Investor Groups in Japan, Pacific-Basin Finance Journal Vol.11 No.1 January, 1-22

Keim Donald, 1983,

Size Related Anomalies and Stock Returns Seasonality: Further Empirical Evidence, Journal of Financial Economics 12, 13-32

Keim Donald, 1990,

A New Look at the Effects of Firm Size and E/P Ratio on Stock Returns, Financial Analysts Journal Vol.46 No.2, 56-67

Keim Donald & Robert Stambaugh, 1986,

Predicting Returns in the Stock and Bond Markets, Journal of Financial Economics 17, 357-390

Kim Chansog (Francis) & Christos Pantzalis, 2003,

Global/Industrial Diversification and Analyst Herding, Financial Analysts Journal March/April, 69-79

Kim Dongcheol, 1997,

A Reexamination of Firm Size, Book-to-Market and Earnings Price in the Cross-Section of Expected Stock Returns, Journal of Financial and Quantitative Analysis Vol. 32 No.4 December, 463-489

Koch Adam S. & Amy X. Sun, 2004,

Dividend Changes and the Persistence of Past Earnings Changes, Journal of Finance Vol. LIX No.5 October, 2093-2116

Kothari S.P. & Jay Shanken, 1992,

Stock Return Valuation and Expected Dividends: A Time Series and Cross Sectional Analysis, Journal of Financial Economics 31, 177-210

Bibliography

Kothari S.P., Jay Shanken & Richard G. Sloan, 1995,

Another Look at the Cross-section of Expected Stock Returns, Journal of Finance, Vol. L No.1 March, 185-224

L **La Porta Rafael, 1996,**

Expectations & the Cross-Section of Stock Returns, Journal of Finance Vol. LI No.5 December, 1715-1742

Lakonishok Josef, Andrei Shleifer & Robert W. Vishny, 1994,

Contrarian Investment, Extrapolation & Risk, Journal of Finance Vol. XLIX No.5 December, 1541-1578

Lakonishok Josef & Jay R. Ritter, 1992,

Measuring Abnormal Performance Do Stocks Overreact? Journal of Financial Economics 31

Lakonishok Josef, Rafael La Porta , Andrei Shleifer & Robert W. Vishny, 1995,

Good News for Value Stocks: Further Evidence on Market Efficiency, NBER Working Paper 5311 October, 1-18

Levis Mario, 1985,

Are Small Firms Big Performers, The Investment Analyst 76, 21-27

Levis Mario, 1989,

Stock Market Anomalies: A Re-Assessment Based on the UK Evidence, Journal of Banking and Finance, 675-696

Levis Mario, 1995,

Macroeconomic Factors in Size and Value Strategies, paper presented at Inquire UK Conference,
Hertfordshire, October 1995, 1-42

Levis Mario, 1999,

The Record on Small Companies: A Review of the Evidence, unpublished manuscript, Cass Business School

Levis Mario & Dylan C. Thomas, 1999,

Country Funds and Investor Sentiment: UK & US Evidence, Working Paper, City University Business School, 1-36

Levis Mario & Manolis Liodakis, 1999,

Investors' Expectations and the Performance of Value and Growth Portfolios: The UK Evidence, Working Paper, City University Business School, 1-34

Levis Mario & Manolis Liodakis, 2001,

Contrarian Strategies and Investor Expectations: The UK Evidence, Financial Analysts Journal Vol. 57 No.5 September/October 2001, 43-56

Levis Mario & Michael Steliaros, 1999,

The Relative Performance and Characteristics of European Small Companies, unpublished manuscript, Cass Business School

Lim Terence, 2001,

Rationality and Analysts' Forecast Bias, Journal of Finance Vol. LVI No.1 February, 369-385

Lo Andrew W. & Craig A. MacKinlay, 1990,

When are Contrarian Profits due to Stock Market Overreaction, Review of Financial Studies 3, 175-208

Loh Roger K. & Mujtaba Mian, 2003,

The Quality of Analysts' Earnings Forecasts During the Asian Crisis: Evidence from Singapore, Journal of Business Finance & Accounting 30 No.5/6 June/July, 749-768

Loewenstein Mark & Gregory A. Willard, 2005,

The Limits of Investor Behaviour, Journal of Finance Vol. LXI No.1 February

M **McManus Ian, Owain ap Gwilyn & Stephen Thomas, 2004,**

The Role of Payout Ratio in the Relationship Between Stock Returns and Dividend Yield, Journal of Business Finance & Accounting Vol.31 No9/10 November, 1355-1387

McQueen Grant, Michael Pinegar, Steven Thorley, 1996,

Delayed Reaction to Good News & the Cross-Autocorrelation of Portfolio Returns,
Journal of Finance Vol. L1 No.3 July, 889-919

Bibliography

Miles David & Allan Timmermann, 1996,

The Predictability of Stock Returns: Evidence on the Pricing of Equities from a Cross-Section of UK Companies, Economica 63, 369-382

Morgan Stanley Capital International, 1998

Methodology & Index Policy

Mott Claudia E. & Daniel P. Coker, 1993,

Earnings Surprise in the Small-Cap World, Journal of Portfolio Management Fall, 64-76

Mozes Haim A., 2000,

The Role of Value in Strategies Based on Anticipated Earnings Surprise, Journal of Portfolio Management Winter, 54-62

Muradoglu Gulnur, 2001,

Portfolio Managers' & Novices' Forecasts of Risk & Return: Are There Predictable Forecast Errors?, City University Business School Faculty of Finance Working Paper No.3 October

Muradoglu Gulnur, Aslihan Salih & Muhammet Mercan, 2001,

A Behavioural Approach to Efficient Portfolio Formation, City University Business School Faculty of Finance Working Paper No.11 November

P **Pari Robert, Steven Carvell & Timothy Sullivan 1989,**

Analyst Forecasts and Price/Earnings Ratio, Financial Analysts Journal March/April 1989, 60-62

Petkova Ralitsa 2002,

Do the Fama and French Factors Proxy for Innovations in Predictive Variables?

Philips Thomas K. & Jarrod W. Wilcox 2005,

The P/B-ROE Valuatio Model Revisited, Journal of Portfolio Management Summer

R **Radner Roy & Michael Rothschild, 1975,**

On the Allocation of Effort, Journal of Economic Theory June 10(3), 358-376

Raghubir Priya & Sanjiv Ranjan Das, 1999,

A Case for Theory-Driven Experimental Enquiry, Financial Analysts Journal November/December, 56-79

Reiganum Marc, 1981,

Mis-specification of Capital Asset Pricing: Empirical Anomalies Based Earnings Yield and Market Values, Journal of Financial Economics 9, 19-46

Reiganum Marc, 1983,

Portfolio Strategies based on market capitalization, Journal of Portfolio Management Winter, 29-36

Roll Richard, 1981,

A Possible Explanation for the Small Firm Effect, Journal of Finance 36, 879-888

Rouwenhorst Geert K., 1999,

Local Return Factors & Turnover in Emerging Stock Markets, Journal of Finance Vol. 54, No.4, 1439-1464

Rozeff Michael S, 1984,

Dividend Yields Are Equity Risk Premiums, Journal of Portfolio Management 11 Fall, 68-75

Rubenstein Mark, 2001,

Rational Markets: Yes or No? The Affirmative Case, Financial Analysts Journal Vol. 57 No.3 May/June, 15-29

S **Salomon Smith Barney, A Member of Citigroup, 2000,**

Equity Style Investing and the Salomon Smith Barney World Equity Style Indices, January

Scott James, Margaret Stumpp & Peter Xu, 2003,

Overconfidence Bias in International Stock Prices, Journal of Portfolio Management Winter, 80-89

Sen Amartya, 1977,

Rational Fools: A Critique of the Behavioural Foundations of Economic Theory, Philosophy & Public Affairs Summer 6(4), 317-344

Bibliography

Sharpe William F., 1964,

Capital Asset Prices: A Theory of Market Equilibrium Under Conditions of Risk, Journal of Finance 19, 425-442

Shefrin Hersh , 2001,

Security Market Imperfections in Worldwide Equity Markets, Journal of Economic Literature Vol. 39 No.4, 1246-1248

Shefrin Hersh & Meir Statman, 1985,

The Disposition to Sell Winners Too Early and Ride Losers Too Long: Theory & Evidence, Journal of Finance 40(3), 777-792

Shefrin Hersh & Meir Statman, 1995,

Making Sense of Beta, Size and Book-to-Market, Journal of Financial and Quantitative Analysis Vol. 21 No.2, 26-34

Shefrin Hersh & Richard Thaler, 1988,

The Behavioural Life-Cycle Hypothesis, Economic Inquiry 26(4), 609-643

Shen Pu, 2000,

The P/E Ratio and Stock Market Performance, Economic Review, Fourth Quarter, 23-36

Shiller Robert J., 2002,

Bubbles, Human Judgment and Expert Opinion, Financial Analysts Journal Vol. 58 No.3 May/June 2002, 18-27

Shleifer Andrei & Robert W. Vishny, 1997,

TThe Limits of Arbitrage, Journal of Finance Vol. 52 No.1, 35-55

Sorensen Eric H. & Robert Arnott, 1988,

The Risk Premium and Stock Market Performance, Journal of Portfolio Management Vol. 14 No.4, 50-55

Statman Meir, 1999,

Behavioral Finance: Past Battles & Future Engagements, Financial Analysts Journal November/December, 18-27

Statman Meir, 1999,

Foreign Stocks in Behavioral Portfolios, Financial Analysts Journal March/April, 12-16

Statman Meir & Kenneth L. Fisher, 2003,

Consumer Confidence and Stock Returns, Journal of Portfolio Management Fall, 115-127

Strong Norman & Xinzhong Xu, 1997,

Explaining the Cross-Section of UK Expected Stock Returns, British Accounting Review 29, 1-23

Summers Lawrence H., 1986,

Does the Stock Market Rationally Reflect Fundamental Values?, Journal of Finance Vol.41 No.3 , 591-601

T

Tamura Hiromichi, 2002,

Individual-Analyst Characteristics and Forecast Error, Financial Analysts Journal Vol. 58 No.4 July/August, 28-35

Thaler Richard H., 1999,

The End of Behavioral Finance, Financial Analysts Journal November/December, 12-17

Teo Melvyn & Sung-Jun Woo, 2004,

Style Effects in the Cross-Section of Stock Returns, Journal of Financial Economics Vol.74 No.2 November, 367-398

V

Vuolteenaho Tuomo, 2002,

What Drives Firm-Level Stock Returns?, Journal of Finance Vol.57 No.1 February, 233-264

W

Warther Vincent, 1995,

Aggregate Mutual Fund Flows & Security Returns, Journal of Financial Economics 39, 209-235

Womack Kent L., 1996,

Do Brokerage Analysts' Recommendations Have Investment Value, Journal of Finance Vol. LI No. 1 March, 137-167

Z

Zhang Lu, 2005,

The Value Premium, Journal of Finance Vol.60 No.1 February, 67-103

Bibliography