

Market multiples and stock returns among emerging and developed financial markets

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Abstract

This paper compares the impact of market multiples on stock returns between emerging (ASEAN) and developed (European) financial markets. A *t*-test, fixed effects, and GMM are applied to a sample of 4725 firms for fifteen years. The findings show that market multiples differ across emerging and developed financial markets. In both markets, the ratios of price/book, price/cash flow, price/dividend, and price/sales positively affect stock returns. Price/earnings and dividend growth negatively affect stock returns in ASEAN. In contrast, price/earnings is insignificant, while dividend growth positively affects stock returns in European markets. The 2008–2009 financial crisis and the 2011–2012 European debt crisis have a negative impact on stock returns. Furthermore, the relationship between market multiples and stock returns differs significantly before and after the crisis. The study helps practitioners to understand that the characteristics of financial markets vary and so does the impact of market multiples on stock returns.

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1. Introduction

Financial market practitioners are concerned about the market price of stocks, with regard to whether they are overpriced, underpriced, or at equilibrium compared to the intrinsic value. The methods used in the past to evaluate assets by applying accounting measures include fundamental analysis (Penman, 1992). Market indicators, such as price/sales ratio, price/earnings ratio, price/dividend ratio, price/cash-flow ratio, and book/market ratio, were used to analyze the value of stocks (Bodie et al., 2002; Stowe et al., 2007). These measures help investors to reduce information asymmetry cost and loss on their investment (Alroaia et al., 2012) and have also been used to predict stock returns (Trevino & Robertson, 2002).

Researchers have found several market indicators to evaluate stock returns in different markets. Applying financial ratios as a benchmark often resulted in inappropriate or erroneous conclusions, especially when applying from one country to another country to evaluate firms (Decker & Brunner, 1997).

Financial characteristics of firms differ significantly across countries (Choi et al., 1983), as do the economic, institutional, and accounting environments (Padmalingam, 2002). Variances in the economic, institutional, and operating environments further decrease the comprehensibility and comparability of financial accounting information across borders (Choi et al., 1983). Choi and Levich (1990) argued that, due to wide economic differences among countries, investors face a problem in interpreting financial accounting information. These difficulties with diversity in accounting procedures may lead to lower returns for investors than expected in the financial markets because they use the same indicators to predict returns as benchmarks for all markets (Mueller et al., 1984). Thus,

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investors need to know the nature and characteristics of financial markets. Based on this knowledge, they should set different benchmarks for different markets.

Xiao et al. (2004) and Nobes (2006) reported that the main drivers of a financial reporting system are the characteristics of the finance system in a country. The characteristics and financial structure of a developing market are different from those of developed financial markets. Fama (1970) stated that the reliability of information depends on the efficiency of the stock markets. Securities prices do not reflect all available information in developing financial markets due to market inefficiency (Bessembinder & Chan, 1995). Bessembinder and Chan (1995) showed that technical trading rules could predict changes in several emerging stock market indices, suggesting that these markets were inefficient from 1975 to 1989. However, financial markets in developed economies are more efficient and help investors to use the information contained in the market price of stocks. In addition, differences in technical exchange rules and the accounting standards lead to the forecasting of stock returns in a different way in emerging markets than in developed markets (Bessembinder & Chan, 1995). Thus, the predictability of stock returns with the use of fundamental ratios is different in emerging markets from developed markets. Moreover, unexpected circumstances, for example, the financial crisis also affects the predictability of stock returns as changes in financial conditions change the behavior of investors, policymakers, and investment conditions. Pinto et al. (2018) argued that a difference is found in the regional use of market multiples. They further argued that the use of market multiples in predicting stock returns depends on geographic regions, the nature of job functions, firm types, and client types. These arguments further support the foundation of our study.

In the literature, researchers have discussed the impact of market multiples on stock returns, for example, Akhtar and Rashid (2015), Alroaia et al. (2012), Anwaar (2016), Barbee et al. (2008), Bird and Whitaker (2003), Capaul et al. (1993), Cordeiro da Cunha Araújo and André Veras Machado (2018), Damodaran (2006), Dechow et al. (2001), Fama and French (1998, 2006), and Park (2010). More recently, Dai and Zhu (2020) combined the sum-of-the-parts method and ensemble empirical mode decomposition to check the impact of the market multiples on stock returns. However, these studies still lack evidence on whether the ability of market multiples to predict stock returns varies from market to market and whether unexpected financial circumstances change the predictability of stock returns and the relationship between market multiples and stock returns.

To fill this gap, we study the five largest emerging economies in the members of the Association of Southeast Asian Nations (ASEAN) and the five largest economies in the European Union (EU) to determine the relationship between stock returns and market multiples. The ASEAN members are Malaysia, Philippines, Indonesia, Thailand, and Singapore. Chien et al. (2015) documented that over the past two decades market capitalization of the ASEAN countries has increased,

along with capital appreciation and the number of firms listed on ASEAN markets, resulting in an increase in the size of stock markets. They added that other factors, such as financial liberalization and deregulation undertaken domestically, as well as a high inflow of foreign investment, helped boost ASEAN capital markets. These statistics highlight the importance of ASEAN markets in global economic development. Furthermore, these economies are the founders of ASEAN and have similar financial characteristics and macroeconomic factors. The member countries in the EU are France, the United Kingdom, Germany, Spain and Italy. These economies collectively represent more than 70 percent of the European gross domestic product. These countries are also similar in terms of financial market characteristics and have similar macroeconomic factors.

The fundamental objectives of both associations, the EU and ASEAN, are similar in their common interests, including economic, cultural, social, technical, administrative, scientific, educational, professional, trading, agricultural, and industrial fields. However, the EU's markets are well established and enjoy stronger mutual assistance, as well as active collaboration, than those in ASEAN. These markets provide us with a better setting for comparing differences in the impact of market multiples on stock returns. This study also provides evidence on the role of market multiples in predicting stock returns by identifying the most influential indicators in both markets. The impact of market multiples on stock returns during the before and after the global financial crisis in 2008–2009 and the European debt crisis in 2011–2012 has also been analyzed as additional evidence. This study raises the following questions to support our contribution to the literature:

- Do market multiples differ between emerging and developed financial markets in predicting stock returns?
- Do the results of this study differ between emerging and developed markets?
- How do market multiples affect stock returns before and after the 2008–2009 financial crisis and the 2011–2012 European debt crisis?

To answer these questions, the current study employs data on ASEAN and European firms. We used price/book, price/cash flow, price/dividend, price/sales, and price/earnings to check their impact on stock returns. The reason for using these indicators is that Pinto et al. (2018) reported that these multiples are the most widely used and trustworthy indicators among practitioners, investors, and firms worldwide. The findings show that market multiples have higher predictive power in European markets. Price/book, price/cash flow, price/dividend, and price/sales have similar results in predicting stock returns on both ASEAN and European markets, although price/dividend has a slightly weaker relationship in the ASEAN markets. Price/earnings has a significantly negative relationship with stock returns in ASEAN markets, but it is insignificant in European markets. The coefficient for dividend growth is significantly negative in ASEAN but significantly

positive in European markets. The results are robust in the dynamic panel model, where price/earnings has a strong positive relationship with stock returns in European markets. Hence, market multiples and their relationship with stock returns differ in developing and developed financial markets. Moreover, the financial crisis of 2008–2009 and the European debt crisis of 2011–2012 have a negative impact on stock returns. The results have significant differences in predictive power, along with the significance of market multiples in predicting stock returns before and after the 2008–2009 financial crisis and the 2011–2012 European debt crisis.

In the remainder of the paper, section 2 reviews the related literature, followed by a discussion of the important market multiples and the crisis. Samples and data are discussed in the following section, followed by the results of the study. The last section offers conclusions, limits and recommendations.

2. Literature review

Investors and market makers rely heavily on market indicators to assess stock market performance (Molodovsky, 1953). Researchers have used technical analysis, fundamental examination, capital market theory, portfolio study, and an institutional location for many years to predict stock returns. Fundamental price ratios, including earnings/price, cash flow/price, book/market, and value/market have been used by market analysts to refine investment strategies (Dechow et al., 2001). Investors and organizations use market multiples because they are simple and easy to calculate and use actual data for quick analysis and actual results (Damodaran, 2006).

The concept of using market multiples to evaluate stocks was first introduced by Graham and Dodd (1934). Nicholson (1960) established the relationship between the price/earnings ratio and stock returns and found an inverse relationship between them. To evaluate the usefulness of the price/earnings ratio as an analytical tool, McWilliams (1966) studied 390 firms from 1953 to 1964 and argued that stocks with a low price/earnings ratio had better investment performance. The study then conducted a cross-sectional test on a hundred stocks for the same sample period and sorted them based on the price/earnings ratio to test their relationship to market indicators. The results showed that stocks with maximum returns every year had a low price/earnings ratio.

Capaul et al. (1993) studied the price/book ratio for Japanese, Swiss, German, French, UK, and US markets over a ten-year sample period (1981–1992). They found a significantly positive association between the book/market ratio and stock returns. Fama and French (1998) investigated the relationship between stock returns and financial ratios sorted on earnings/price, cash flow/price, book/market, and dividend/price ratios for the period 1975–1995, in twelve major markets, including the US, the UK, France, the Netherlands, Singapore, Belgium, Australia, Switzerland, Sweden, Hong Kong, Japan, and Germany. They found higher returns for stocks with higher ratios. Bird and Whitaker (2003) inspected four key ratios (book/market, dividend yield, earnings yield, and sales/price) to examine their impact on stock returns at sample firms in

eight European countries. They found a higher return on value stocks than growth stocks.¹

In the UK market, Levis (1989) found a strong relationship between the dividend yield, price/earnings ratio, and stock returns for the period April 1961 to March 1985. Strong and Xu (1997) found a significant positive relationship between β , book/market equity, and market leverage with average stock returns in the UK market for the period July 1973 to July 1992. Basu (1977) investigated 1400 industrial firms listed on the New York Stock Exchange (NYSE) from 1956 to 1971. By adjusting the risk factor, the study found that the portfolios composed of lower price/earnings ratio stocks had higher than average returns, compared to stocks with a higher price/earnings ratio. In an updated version of the research, Basu (1983) again found an inverse relationship between the price/earnings ratio and risk-adjusted stock returns even after controlling for firm size. Goodman and Peavy (1983), Jaffe et al. (1989), and Tseng (1988) achieved similar results, following Basu (1983). Based on NYSE and AMEX stock data, Reinganum (1981) found an inverse connection between the price/earnings ratio and the average returns. Bleiberg (1989) and Good (1991) also documented the inverse relationship between the price/earnings ratio and stock returns. Levy and Lerman (1985) found that stocks with lower transaction costs as well as a lower price/earnings ratio have higher returns. Chan and Chen (1991) found higher returns for stocks with lower market multiples in the Japanese stock market from 1971 to 1988, especially stocks with a lower book/price and lower cash-flow/price ratio. A significant negative relationship was found by Fama and French (2006) between market multiples and stock returns in the US stock market in 1963–2004. They also found a similar relationship for fourteen major stock markets excluding the US, for the period 1975–2004.

Several authors have documented a positive association between stock returns and basic indicators. Stocks with a higher cash-flow/price ratio and book/market ratio have higher risk-adjusted returns and prediction power (Chan et al., 1993). A study on the Korean stock market (1982–1993) by Dhatt et al. (1997) showed that stocks with a higher sales/price ratio, debt-to-equity ratio, and book/market ratio have higher returns. For the Russell 2000 index, sales/price, book/market, and debt to equity positively affected stock returns, and book/market had greater explanatory power than other variables in 1979–1997 (Manjeet et al., 1999). The price/earnings ratio had a positive relationship with earnings growth and the dividend payout ratio for S&P 500 stocks, in 1968–1993 (Loughlin, 1997). The effect of the price/earnings ratio on stock returns was confirmed by White (2000), over a long sample period, 1926 to 1997. Damodaran (2006) argued that high-growth firms had higher price/earnings ratios than low-growth firms and that less-risky firms had a higher price/earnings ratio than high-risk firms. A study on the daily trading price of stocks for forty-six firms listed on the Tehran Stock Exchange from 2001 to 2008

¹ Value stocks are stocks with low ratios while growth stocks have high ratios (Capaul et al., 1993).

also showed a significant positive association between the price/earnings ratio and stock returns (Alroaia et al., 2012). A positive relationship was found between basic market indicators and stock returns (Dechow et al., 2001). Lau et al. (2002) examined the relationship between stock returns and firm-specific variables, such as beta, firm size, price/earnings ratio, cash-flow/price ratio, market/book ratio, and the growth rate of sales. They employed a cross-sectional analysis on 82 Singaporean and 163 Malaysian firms in 1988–1996. In their study, sales growth had a negative relationship with the returns on Singaporean stocks and earnings/price had a positive relationship with returns on Malaysian stocks. Pech et al. (2015) reported that, for a limited period, financial ratios predict future stock returns. They found that the financial ratios predict the return on stocks for one year, but the following year, the ratios were not significant.

Some studies documented the lack of a significant relationship between market multiples and stock returns. Gillan (1990) did not find any effect of the price/earnings ratio on stock returns from 1977 to 1984, in New Zealand's stock markets. Trevino and Robertson (2002) studied the US stock market (S&P 500 Composite Index) between 1949 and 1997 to examine the effect of the price/earnings ratio on stock returns. The results of their study showed a lack of significant relationship between the price/earnings ratio and short-term returns, but it was useful in estimating long-term stock returns. Mahdi and Farzaneh (2012) studied ninety-five firms listed on the Tehran Stock Exchange over the period 2006–2010. They found the absence of a significant relationship between the price/earnings ratio, earnings per share, price/book ratio, and short-term stock returns.

More recently, Anwaar (2016) examined FTSE-100 Index London data to test the relationship between financial ratios and firm performance. The results of his study showed that the net profit margin and return on assets have a positive effect on stock returns, whereas earnings per share have a negative effect on stock returns. Igrejas et al. (2017) studied the Brazilian stock market and found that the EV/EBITDA (earnings before interest, taxes, depreciation, and amortization) has strong predictive power for stock returns. They found higher abnormal returns for stocks with higher EV/EBITDA ratios. Zaremba and Szczygielski (2019) studied seventy-three national equity indices to assess their performance in 1996–2017. They found that EBITDA/EV (enterprise value) ratio as the dominant indicator of a stock's performance. Cordeiro da Cunha Araújo and André Veras Machado (2018) investigated the relationship between stock returns in the Brazilian capital market and the book/market ratio and the return on equity. They found that the book/market ratio and the return on equity, together with proxies for risk factors, explain the fluctuations in stock returns. Musallam (2018) studied Qatari listed firms and found that the earnings-yield ratio, earnings per share, and dividend yield ratio positively affect stock returns.

Studies have shown mixed evidence regarding the relationship between market multiples and stock returns that supports our argument that market multiples differ in different markets in predicting stock returns. However, current studies

still lack empirical evidence that market multiples differ in predicting stock returns in different markets. To prove this, the current study uses five multiples—price/book, price/sales, price/dividend, price/cash flow ratio, and price/earnings ratio—to determine their impact on stock returns. The reason for using a number of multiples is that no single multiple has generally been accepted for evaluating stocks (Lie & Lie, 2002). The next section discusses market multiples and proposed hypotheses developed in this study.

2.1. Differences in market multiples among different financial markets

Differences in the accounting practices and standards, cultural, economic, and institutional environments result in significant differences in the financial ratios across countries. This paper offers new evidence on the differences in market multiples among different financial markets and their impact on stock returns. Numerous researchers have argued about the differences in financial ratios in different financial markets. For example, US firms showed higher liquidity ratios than Latin American firms (Etter et al., 2006). US firms had higher solvency ratios than Japanese, Korean, and Italian firms (Choi et al., 1983; Hagigi & Sponza, 1990). Hagigi and Sponza (1990) found lower asset turnover in Italy than in the US, with its more aggressive sales practices. Asheghian (2012), Fuglister (1997), and Liu and O'Farrell (2009) documented significant differences in financial ratios between US and Chinese firms. Based on this evidence, our study predicts the differences in market multiples between emerging (ASEAN) and developed (Europe) financial markets (H1).

2.2. Price/book ratio

The price/book ratio is a function of the projected level of profitability (Fairfield, 1994). A higher price/book ratio shows that a firm will generate higher earnings in the future with the assets it owns. However, a lower price/book ratio indicates that the firm will not create financial value for investors that would cover their return on equity, as they require. Fama and French (1992) found that the book/market ratio had higher predictability than the earnings/price ratio. In European markets, Bird and Whitaker (2003) and Bird and Casavecchia (2007) found that the book/market ratio and the sales/price ratio are the best indicators for predicting stock returns, rather than the earnings/price ratio. For average US stocks, Rosenberg et al. (1985) reported higher returns with a higher book/market ratio. Fama and French (1992) studied data on nonfinancial firms listed on NYSE from 1963 to 1990 and found a positive association between stock returns and the book/market ratio. Louis et al. (1991) showed a significant positive relationship between earnings yield and the book/market ratio during the period 1971–1988 at manufacturing and non-manufacturing firms listed on the Tokyo Stock Exchange. In the Indonesian stock market, stocks with a higher price/book ratio had lower returns in 1985–1992 (Roll, 1995). Chan and Chen (1991) found that stocks on the Japanese stock market with a lower

book/price ratio have higher returns. Aydoğan and Gursoy (2000) and Aby et al. (2001) also reported higher returns for stocks with a higher price/book ratio. With this evidence, the current study argues that stocks with a higher price/book ratio have higher returns (H2).

2.3. Price/cash-flow ratio

Investors use the price/cash-flow ratio to predict the financial strength of a firm based on market opportunities. Price/sales and price/earnings ratios use the measures of accounting earnings that can be manipulated in financial statements of firms. Misleading and biased estimates of economic earnings can be overcome with the use of the cash-flow per share. The nature of cash-flow helps to reduce manipulation, as the cash flow is less exaggerated by accounting measures and deals with cash that comes into or goes out of the firm. A low price/cash-flow ratio indicates that the firm is generating abundant cash that is not yet absorbed by the current stock price and vice versa. A positive association is found between stock returns and the cash-flow ratio scaled by price for nonfinancial firms listed on the NYSE (Lakonishok et al., 1994; Sloan, 1996). Chan and Chen (1991) found a positive effect of cash-flow/price ratios on stock returns in Japan. Stocks with a higher cash-flow/price ratio and book/market ratio showed high risk-adjusted returns and predictive power (Chan et al., 1993). A significant negative relationship between stock returns and price/cash-flow ratios is documented by Barbee et al. (2008) and Akhtar and Rashid (2015). Hence, based on the previous empirical findings, we develop a hypothesis that the relationship between stock returns and the price/cash-flow ratio is ambiguous, as it can either be positive or negative (H3).

2.4. Price/dividend ratio

The price/dividend ratio can be used to analyze the market performance of stocks with regard to the dividend. Fama and French (1988) and Campbell and Shiller (1988) discussed the role of the price/dividend ratio in explaining stock returns. Boudoukh et al. (2007) and Robertson and Wright (2006) studied changes in the predictive power of the price/dividend ratio due to the changing policies of firms regarding the repurchase of shares. Using international data, Park (2010) explained that the predictive power of the price/dividend ratio depends on the consistency of the vast majority of markets. Levis (1989) found a positive relationship between the dividend yield and stock returns in the UK market. The positive impact of the dividend yield on stock returns is also documented by Funda (2010). Bauman et al. (1998) observed higher returns for stocks that had a lower price/dividend ratio and price/cash-flow ratio. Hence, this study also expects to see a negative impact of the price/dividend ratio on stock returns (H4).

2.5. Price/sales ratio

Fisher (1984) discussed the role of the price/sales ratio in affecting stock returns. According to his research, the price/

sales ratio is the least affected ratio in terms of accounting value. From 1979 to 1991, Barbee et al. (1996) found that the sales/price and debt-to-equity ratio had stronger predictive power for stock returns than the book/market ratio. They also argued that using the price/sales ratio was important because it absorbs the role of the market/book ratio, the debt-to-equity ratio, and firm size in explaining stock returns. Studies by Dhatt et al. (1997) and Manjeet et al. (1999) showed higher returns for stocks with a higher sales/price ratio. Rahimi (1995) found an inverse relationship between the price/sales ratio and returns on stocks listed on the Tehran Stock Exchange in 1990–1994. A significant positive relationship between the price/sales ratio and expected stock returns was reported by Barbee (1989) and Barbee et al. (1996). Because of the mixed evidence by past researchers, this study hypothesizes that the relationship between the price/sales ratio and stock returns is ambiguous, as it can either be positive or negative (H5).

2.6. Price/earnings ratio

One of the most useful indicators for predicting fluctuations in future profits is the price/earnings ratio (Fairfield, 1994). The price/earnings ratio helps predict a firm's future market value in terms of earnings per share (Barbee et al., 2008). A higher price/earnings ratio indicates that the investors are paying more for earnings (DeBondt & Thaler, 1985). At the same time, investors feel secure because a higher price/earnings ratio means that the firm is on the path to growth with good opportunities, and its earnings are risk-free and safe. However, a low price/earnings ratio is a sign of low growth opportunities with high risk, poor earnings, and undervaluation of stocks. Interpreting price/earnings and the other multiples is always challenging. To predict the future market value of stocks, researchers have documented the price/earnings relationship to stock returns in different markets. Rousseau and Rensburg (2003) studied the monthly dividend-adjusted returns of stocks listed on the Johannesburg Stock Exchange for the period January 1982 to August 1998. They found that the best indicator for predicting stock returns is the price/earnings ratio. Lakonishok et al. (1994), White (2000), Damodaran (2006), and Funda (2010) found positive impacts of the price/earnings ratio on stock returns. This study predicts higher stock returns for firms with a higher price/earnings ratio in both emerging and developed financial markets (H6).

2.7. The 2008–2009 global financial crisis and the 2011–2012 European debt crisis

The 2008–2009 global financial crisis is considered the most dramatic and severe financial crisis since the Great Depression, which began with the subprime mortgage crisis in the US in early 2007. Developed and emerging financial markets were both severely hit in September 2008, which had major economic consequences (Bordo, 2008; Brunnermeier, 2009; Swagel, 2009). After reaching its peak on October 9, 2007, the US stock market fell 53.78 percent on March 9, 2009 (Al-Rjoub & Azzam, 2012). The crisis also affected major

European and Asian stock markets. The main reason for this crisis was the massive monetary expansion in the US before 2007, in which US securities were heavily funded by Asian countries (Bordo, 2008; Brunnermeier, 2009; Orlowski, 2008). In March 2008, the crisis worsened and turned into a recession. Investors began to move their investment into commodity futures (Orlowski, 2008). When the crisis ended in 2009, investors regained confidence and resumed investing in securities. The 2008 financial crisis had a significantly negative impact on stock returns in all sectors, with the banking sector the most heavily affected (Al-Rjoub & Azzam, 2012).

After the financial crisis, the European debt crises of 2011–2012 also affected developed and emerging financial markets. The European debt crisis is a product of the financial crisis, which forced the financial system to use commercial credit as an alternative to sovereign debt, which had collapsed (Soros, 2010). Some authors argued that the economic and financial crisis in Greece in late 2009 led to the European debt crisis. The factors that led to the onset of the European debt crisis include liberalization, financial globalization, financial dependence, and the presence of strong market links between states. These crises caused major economic and financial changes in European economies. The crisis may have had a negative impact on investor confidence that forced them to switch their investments out of securities. Thus the impacts of the financial crisis and the European debt crisis on the relationship between market multiples and stock returns are worth investigating. For that reason, this study hypothesizes that the financial crisis and the European debt crises had a significantly negative impact on stock returns (H7).

3. Sample, holding period return, and variables measurement

To test our empirical estimates and hypotheses, we compiled data on firms listed on five ASEAN and five European markets for the period 2000–2014 from the Thomson Reuters database. After excluding firms with missing information, the remaining sample totals 4725 firms (2236 ASEAN and 2489 European) for 15 years, creating 70,875 firm-year observations (33,540 for ASEAN and 37,335 for Europe) to test the hypotheses. Table 1 summarizes the country-wise data on ASEAN and European market sample firms. To reduce the effect of outliers, the data is winsorized at 1st and 99th percentiles, removing extreme values of the financial variables.

To measure stock returns as a dependent variable, this study uses the holding period return (HPR), the rate of return that investors obtain by holding a security over an extended period (Stowe et al., 2007).² The HPR is calculated based on the

Table 1
Summary of the sample firms.

ASEAN		European	
Country NAME	No. of firms	Country	No. of firms
Indonesia	313	France	550
Malaysia	737	UK	1225
Philippines	207	Germany	393
Singapore	498	Spain	113
Thailand	481	Italy	208
Total	2236	Total	2489

Note: Summary of the sample firms by country in ASEAN and European markets.

closing stock price at the end of each year. Yearly accounting data, including sales per share, earnings per share, cash flow per share, book value per share, the number of shares outstanding, net sales, depreciation and amortization, net income after tax, total dividends, earnings before interest, tax, and preferred dividends, are used to calculate market multiples. Accounting data and closing stock prices are collected for the fiscal years from December 31, 2000, to December 31, 2014. The measurements of the market multiples are shown in Table 2.

Following Akhtar and Rashid (2015) and Barbee et al. (2008), we estimate the relationship between market multiples and stock returns with the following equations:

For ASEAN markets:

$$HPR_A = \alpha_{A0} + \beta_{A1}PB_{i,t} + \beta_{A2}PCF_{i,t} + \beta_{A3}PD_{i,t} + \beta_{A4}PS_{i,t} + \beta_{A5}PE_{i,t} + \beta_{A6}DG_{i,t} + e_{i,t} \quad (1)$$

For European markets:

$$HPR_E = \alpha_{E0} + \beta_{E1}PB_{j,t} + \beta_{E2}PCF_{j,t} + \beta_{E3}PD_{j,t} + \beta_{E4}PS_{j,t} + \beta_{E5}PE_{j,t} + \beta_{E6}DG_{j,t} + e_{j,t} \quad (2)$$

where, α_{A0} and α_{E0} are constants in equation (1) (for ASEAN) and equation (2) (for Europe), with coefficients and β_1 to β_6 respectively, i for ASEAN and j for European individual stocks, and e is the error term in both equations.

4. Descriptive and statistical analysis

4.1. Descriptive statistics

The difference in the mean values of market multiples along with stock returns between ASEAN and European markets is shown in Table 3. The mean value of price/book in ASEAN markets is 0.85, which is lower than the mean value of 1.16 in European markets. Similarly, the mean price/dividend, price/sales, and price/earnings values are higher in European markets than ASEAN markets, excluding price/cash flow, for which the value is lower in European markets (4.71). Likewise, the standard deviation is also higher in European markets. This shows that the dispersion from the mean of market multiples is higher for firms in European markets. The higher mean and standard deviation for European firms than

² Investors obtain HPR when they buy and hold stocks. Lakonishok et al. (1994), Bird and Whitaker (2003), Rousseau and Rensburg (2003), and Bird and Casavecchia (2007) recommended investors to use a buy and hold strategy to obtain profits as well as capital appreciation. Rousseau and Rensburg (2003) found that the return increases when the period for holding securities was extended to over twelve months while Bird and Whitaker (2003) showed that return was better for stocks with a holding period of less than a year.

Table 2
Description of the variables used.

Variable	Label	Measurement	Definition
Price/book ratio	<i>PB</i>	$\frac{\text{Current stock price}}{\text{Book value per share}}$	
Price/cash-flow ratio	<i>PCF</i>	$\frac{\text{Current stock price}}{\text{Cash flow per share}}$	Cash flow per share = EPS + (Depreciation and amortization / No of shares outstanding)
Price/dividend ratio	<i>PD</i>	$\frac{\text{Current stock price}}{\text{Dividend per share}}$	Dividend per share = Total dividend / No of shares outstanding
Dividend growth	<i>DG</i>	D_t/D_{t-1}	where, D_t is the dividend at t , D_{t-1} is the dividend at $t-1$.
Price/sales ratio	<i>PS</i>	$\frac{\text{Current stock price}}{\text{Sales per share}}$	Sales per share = Net sales/No of shares outstanding
Price/earnings ratio	<i>PE</i>	$\frac{\text{Current stock price}}{\text{Earnings per share}}$	Earnings per share = (Net income after tax – preferred dividend)/ No of shares outstanding
Financial Crisis 2008		Dummy variable; assigned “0” to the years before the financial crisis 2008 and “1” after the financial crisis 2008.	
Holding period return	<i>HPR</i>	$(P_t - P_{t-1} + D_t)/P_{t-1}$	where, P_t is the stock price at t , P_{t-1} is the stock price at $t-1$ and D_t represents the dividend

ASEAN firms indicate the difference in market multiples and stock returns between the two markets.

4.2. Results of *t*-Test

To confirm the difference in the market multiples and their impact on stock returns, we conduct *t*-tests separately for all multiples. The results in Table 4 show the significant difference in the mean values of the market multiple used in this study. The mean price/book values are 0.85 and 1.16, with a significance of 0.00, in ASEAN and European markets, respectively. Similarly, the mean values of other multiples, including price/cash flow, price/dividend, price/sales, and price/earnings, differed significantly, with a significance of 0.00. Our results are consistent with those in [Asheghian \(2012\)](#), [Fuglister \(1997\)](#), and [Liu and O’Farrell \(2009\)](#). The difference in the mean values may be due to differences in accounting procedures, standards, and the characteristics of financial markets. Thus, as indicated earlier (H1), we confirm a significant difference in the market multiples and their impact on stock returns between emerging and developed financial markets.

Table 4
The *t*-Test Results.

		ASEAN	Europe
Price/book	Mean	.85	1.16
	Std. Err.	.004	.006
	<i>p</i> -value	0.000	
Price/cash flow	Mean	4.88	4.71
	Std. Err.	.030	.0305
	<i>p</i> -value	0.000	
Price/dividend	Mean	13.16	16.17
	Std. Err.	.099	.11
	<i>p</i> -value	0.00	
Price/sales	Mean	1.18	1.36
	Std. Err.	.008	.011
	<i>p</i> -value	0.000	
Price/earnings	Mean	7.71	8.17
	Std. Err.	.052	.0546
	<i>p</i> -value	0.00	
Dividend growth	Mean	.769	.926
	Std. Err.	.0051	.0035
	<i>p</i> -value	0.00	
HPR	Mean	.035	.049
	Std. Err.	.0013	.0014
	<i>p</i> -value	0.00	

Table 3
Descriptive statistics of variables.

		Price/book	Price/cash-flow	Price/dividend	Price/sales	Price/earnings	Dividend growth	HPR
Mean	ASEAN	0.85	4.88	13.16	1.18	7.71	0.77	-0.035
	European	1.16	4.71	16.17	1.36	8.17	0.93	0.049
Standard deviation	ASEAN	1.12	6.60	22.31	2.01	11.55	0.69	0.30
	European	1.38	6.74	24.24	2.28	11.96	0.50	0.32
Minimum	ASEAN	0.00	0.00	0.00	0.00	0.00	0.00	-1
	European	0.00	0.00	0.00	0.00	0.00	0.00	-.537
Maximum	ASEAN	3.59	23.48	76.36	6.82	43.0	2.2	.73
	European	5.51	22.62	83.38	10.16	42.23	3.4	.821

Table 5
The impact of market multiples on stock returns: Results of fixed-effects model.

	ASEAN	Europe
	HPR	HPR
Price/book	0.028*** (0.005)	0.085*** (0.003)
Price/cash-flow	0.002** (0.001)	0.003*** (0.001)
Price/dividend	0.001* (0.000)	0.003*** (0.000)
Price/sales	0.019*** (0.003)	0.019*** (0.002)
Price/earnings	−0.012*** (0.000)	−0.000 (0.000)
Dividend Growth	−0.022*** (0.000)	0.019*** (0.001)
_cons	−0.066*** (0.008)	−0.226*** (0.007)
Number of Groups	2785.000	2546.000
Observations	17,818.000	19,473.000
F Statistics	25.861	462.870
Significance F	0.000	0.000
R Square	0.110	0.241
Year Fixed Effect	Yes	Yes

Notes: Coefficient values estimated by fixed effect panel regression, using equations (1) and (2), for both ASEAN and European data. Standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

4.3. Regression results

We conduct a fixed-effect panel regression analysis to estimate the intercept and slope of market multiples for stock returns in both ASEAN and European markets. The reason for performing fixed-effect panel regression is to investigate whether market multiples are significant in predicting stock returns in both emerging and developed financial markets. Year fixed effects are also included in the model to control for differences in HPR that stem from the business cycle. The models are adjusted for heteroskedasticity by using the White estimate of variance errors.

The results in Table 5 show the difference in the stock return prediction for ASEAN and European markets with R-squared values of 0.110 and 0.241, respectively, indicating the percentage of variations in stock returns that can be explained by the variation in market multiples. The results show that market multiples better able to predict stock returns in European markets than ASEAN markets. Table 5 also shows the relationships between market multiples and stock returns in ASEAN and European markets. The market multiples, including price/book, price/cash flow, price/dividend, and price/sales, have a significantly positive impact on stock returns, in both ASEAN and European markets. However, price/earnings and dividend growth have a significant negative coefficient for stock returns in ASEAN markets. However, price/earnings is insignificant, and dividend growth has a significantly positive coefficient for stock returns in European markets.

As predicted earlier (H2), the price/book ratio has a significantly positive relationship to stock returns in ASEAN and European markets, with coefficients of 0.0028 and 0.085, respectively. This shows that an increase in the price/book ratio

by one percentage point increases stock returns by USD 0.028 in ASEAN markets and USD 0.085 in European markets. Shefrin and Statman (1995) argued that good companies always have a higher price/book ratio. Thus, as argued by Fairfield (1994), the positive relationship is an indication that firms can generate higher earnings in the future because the firms have higher assets. Our results are consistent with Aydoğan and Gursöy (2000) and Aby et al. (2001). In nineteen emerging markets, including Malaysia, Indonesia, Thailand, and the Philippines, Aydoğan and Gursöy (2000) found a positive association between the price/book ratio and stock returns in 1986–1999. Aby et al. (2001) found that stocks with a higher price/book ratio and price/earnings ratio have higher returns than those with lower ratios.

In line with our prediction (H3), the price/cash flow has a significantly positive relationship with stock returns on both ASEAN and European markets with coefficients of 0.02 and 0.003, respectively. As argued earlier, firm managers cannot manipulate the price/cash-flow ratio in financial statements because cash flows cannot be manipulated as easily as earnings per share (Bernard & Stober, 1989). Thus, a positive relationship between price/cash flow and stock returns is a good sign for firms and investors. Our findings are consistent with Brown et al. (2009), who documented a positive relationship between stock returns and the price/cash-flow ratio.

Contradictory to our prediction (H4), price/dividend has a significantly positive relationship with stock returns with coefficients of 0.001 and 0.003 for ASEAN and European markets, respectively. This in contrast to the results of Bauman et al. (1998), who studied the data on twenty-one stock markets and found a significantly negative relationship between the price/dividend ratio and stock returns between 1986 and 1996. Our results are consistent with the findings of Funda (2010), who found a positive relationship between the joint effect of the dividend yield and the price/earnings ratio on returns for stocks listed on the Istanbul Stock Exchange 100 index over the period 2000–2009. Another measure used in the study that is related to dividends is dividend growth. Dividend growth significantly negatively affects stock returns on the ASEAN market, but it has a significantly positive impact on stock returns on European markets.

The price/sales ratio also has a significantly positive impact on stock returns in both ASEAN and European markets, with a coefficient of 0.019 in each market. The results are consistent with Barbee (1989) and Barbee et al. (1996). These results indicate that an increase in the price/sales ratio by one percentage point increases stock returns by USD 0.019 in both the ASEAN and European markets. Thus, we confirm H5.

The price/earnings ratio has a significantly negative relationship with stock returns at the 1 percent level in ASEAN markets. The coefficient, −0.012, indicates that a one-percentage-point increase in price/earnings decreases stock returns by USD 0.012. The coefficient for price/earnings is also negative for European markets, but the relationship is insignificant. This implies that stocks with a higher price/earnings ratio yield lower returns, contrary to our predictions (H6), which is consistent with Barbee et al. (2008) and Liem and Sautma (2012).

For each model, the F-statistic is significant, which shows that the models are stable and reliable. A comparison of the results of both emerging and developed markets reveals a difference in the effect of market multiples on the stock returns of both markets.

This confirms the differences in the impact of market multiples on stock returns in different regions. This may be due to differences in market structure, development, efficiency, accounting standards, and procedures across different regions, which requires caution on the part of investors and market analysts. Our results support the argument of Konijn et al. (2011), that the diversity of countries and financial market structure lead to differences in the relationship between market multiples and stock returns.

4.4. Results of dynamic panel model

In this study, the Arellano-Bond first-difference generalized method of moments (GMM) is used to control for potential endogeneity (Arellano & Bond, 1991). The difference-GMM estimator is suitable for panel data in the current study, as it has a relatively short time dimension and a large unique-firm dimension. The difference-GMM estimator is an effective method for controlling for unobserved firm heterogeneity and potential endogeneity in other regressors. The models in the GMM estimations treat the lagged HPR as an endogenous variable, and thus an instrumental variable is employed. In both models, the independent variable is treated as endogenous and lagged twice. The lag of the endogenous variable is employed as an instrument. Table 6 reports GMM results for both ASEAN and European markets. The coefficient of the lagged HPR is significantly and positively related, which shows that HPR is serially related.

Table 6
The impact of market multiples on stock returns: Results of dynamic panel model.

	ASEAN	Europe
HPR _{t-1}	0.030 (0.028)	-0.278*** (0.042)
Price/book	0.042*** (0.013)	0.081*** (0.023)
Price/cash-flow	0.001 (0.002)	0.007 (0.006)
Price/dividend	0.003*** (0.000)	0.001 (0.001)
Price/sales	0.012** (0.006)	0.065*** (0.008)
Price/earnings	-0.009*** (0.001)	0.019*** (0.004)
Dividend Growth	0.001 (0.001)	0.142** (0.065)
_cons	-0.015 (0.014)	-0.670*** (0.033)
Number of Groups	2591.000	1938.000
Observations	16,193.000	17,832.000
Hansen test	0.21	0.17
AR(2)	0.58	0.38

Notes: Coefficient values estimated by dynamic panel regression, using equations (1) and (2), for both ASEAN and European data. Standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

The results of the dynamic panel model are slightly different from those of the fixed-effect model in resolving endogeneity issues. However, the overall results confirm the differences in the relationship between stock returns and market multiples for ASEAN and European markets. The results of the dynamic model show that the price/cash flow has become insignificant in both markets. The growth dividend and price/dividend became insignificant for the ASEAN and European markets, respectively.

This shows that, after controlling for unobserved heterogeneity and potential endogeneity problems, the overall results are robust. We therefore confirm that market multiples and their impact on stock returns is significantly different between emerging and developed financial markets. The results of the Hansen test of overidentification show that the instruments used are valid, as the p -values are higher, that is, 0.21 and 0.17, for ASEAN and European markets, respectively. This means that we cannot reject the null hypothesis that all instrumental variables are valid. The AR(2) test has higher p -values, 0.58 and 0.38, indicating that the null hypothesis of “no second-order serial correlation” cannot be rejected.

4.5. The 2008–2009 global financial crisis and the 2011–2012 European debt crisis

A dummy variable is used to investigate the impact of the global financial crisis and the European debt crisis on stock

Table 7
The impact of the 2008–2009 financial crisis and the 2011–2012 European debt crisis on stock returns.

	Fixed-effect HPR	GMM HPR
HPR _{t-1}		-0.135*** (0.026)
Price/book	0.044*** (0.002)	0.084*** (0.010)
Price/cash flow	0.001*** (0.000)	0.004** (0.002)
Price/dividend	0.002*** (0.000)	0.001* (0.000)
Price/sales	0.011*** (0.001)	0.038*** (0.004)
Price/earnings	-0.001*** (0.000)	-0.002 (0.002)
Dividend Growth	-0.000*** (0.000)	0.002 (0.002)
Dummy Variable	-0.000 (0.004)	-0.109*** (0.010)
_cons	-0.085*** (0.004)	-0.087*** (0.019)
Number of Groups	5331.000	4529.000
Observations	37,291.000	34,025.000
R Square	0.46	.
Year Fixed Effect	Yes	.
Hansen test		0.00
AR(2)		0.00

Notes: Coefficient values estimated by panel regression, including the dummy variable for the 2008–2009 financial-crisis and the 2011–2012 European debt crisis. Standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 8
The impact of market multiples on stock returns pre- and post-crisis.

	ASEAN before crisis	ASEAN after crisis	Europe before crisis	Europe after crisis
Price/book	−0.009 (0.006)	0.032*** (0.005)	0.034*** (0.003)	0.044*** (0.003)
Price/cash-flow	0.003*** (0.001)	−0.001 (0.001)	0.000 (0.001)	0.002*** (0.001)
Price/dividend	0.001*** (0.000)	0.001*** (0.000)	0.002*** (0.000)	0.003*** (0.000)
Price/sales	0.005 (0.004)	0.008*** (0.002)	0.008*** (0.001)	0.005*** (0.001)
Price/earnings	−0.002*** (0.001)	−0.002*** (0.000)	−0.001** (0.000)	0.000 (0.000)
Dividend Growth	−0.001* (0.001)	−0.000** (0.000)	0.005*** (0.001)	0.005*** (0.001)
_cons	−0.130*** (0.008)	0.029*** (0.008)	−0.001 (0.006)	−0.153*** (0.007)
Number of Groups	2340.000	2640.000	2193.000	2492.000
Observations	7548.000	10,270.000	9120.000	10,352.000
F Statistics
R Square	0.1121	0.2531	0.2064	0.1591
Year-Fixed Effect	Yes	.	Yes	Yes

Notes: Coefficient values estimated by panel regression before and after the crisis for both ASEAN and European Markets. Standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

returns. Following Elyasiani et al. (2020), we divided the sample firms into two periods: 2000 to 2007 is the pre-crisis period, and 2008 to 2014 is the financial crisis period. The results in Table 7 show that the dummy variable has a significantly negative relationship with stock returns for the full dataset in both the fixed-effects and dynamic panel models (both ASEAN and European markets). The results are consistent with those of Al-Rjoub and Azzam (2012), who found a negative impact of the financial crisis on stock returns.

Price/book, price/cash flow, price/dividend, price/sales, and price/earnings have a significant relationship with stock returns in the fixed-effects model. In the dynamic panel model, price/earnings and dividend growth become insignificant after endogeneity issues are controlled for. The inclusion of dummy variable slightly changes the impact of market multiples on stock returns. Thus, the overall results are robust.

We performed an additional test to confirm that the predictive power and the significance of market multiples vary before and after the financial crisis and the European debt crisis. The results are reported in Table 8. In ASEAN markets, the coefficients of price/book, price/sales, and dividend growth are insignificant before the crisis. These variables have a significantly positive relationship with stock returns after the crisis. However, price/cash flow was significant before the crisis, but it became insignificant after the crisis. R^2 increased from 0.1121 to 0.2531, which shows that the crisis increased the predictability of market multiples.

However, price/cash flow was insignificant before the crisis, but it became significantly positive after the crisis for European markets. Moreover, prior to the crisis, the price/earnings ratio was significantly negative, but it became insignificant after the crisis in European markets. R^2 decreased from 0.2064 to 0.1591, which shows that the predictability of market multiples was hit hard by the crisis. Hence, the results are

confirmed for H5: the financial crisis and the European debt crisis have a significant impact on the relationship between stock returns and market multiples.

5. Conclusion

Because of the nature of rapid growth, ASEAN markets are attracting attention from investors all over the world. Despite this growth and increasing interest from international investors, few studies have focused on ASEAN markets. However, much attention has been drawn to developed financial markets, such as European markets. Investors, market participants, and financial actors are always looking for effective investment strategies using a variety of market indicators. In the past, market indicators were used in various financial markets to estimate stock returns, and most market analysts and investors use these market indicators to predict stock returns. This study provided evidence to show that market indicators are different for evaluating stock returns in different markets. Thus, investors, market analysts, and firms' managers should be careful when evaluating stocks based on market multiples in one market to evaluate firms in another market.

The findings of our study reveal that market multiples have a greater ability to predict stock returns in European markets than in ASEAN markets. However, after the financial crisis, the predictive power in ASEAN and European markets increased and decreased, respectively. Among the market multiples used in the study, price/book, price/cash flow, price/dividend, and price/sales have similar results in the two markets. However, price/earnings has a significantly negative relationship to stock returns in ASEAN markets but an insignificant relationship in European markets. The coefficient for dividend growth is significantly negative in ASEAN markets but significantly positive in European markets. In the

robustness testing, price/earnings showed a positive relationship with stock returns in European markets. The study also analyzed the impacts of the 2008–2009 financial crisis and the 2011–2012 European debt crisis on stock returns. The results showed that the crisis negatively affects stock returns. The study found that the significance level, predictive power, and the magnitude of market multiples in predicting stock returns differ significantly before and after the 2008–2009 financial crisis and the 2011–2012 European debt crisis.

5.1. Limitations and Directions for future research

The study focuses on two different regions, developing and developed regions. Future studies should extend the literature to developed or developing financial markets to explore differences in different markets with the same characteristics. Future studies might also seek insights into the reasons for these differences, such as why predictability of market multiples in different financial markets is different. Some scholars have documented that fundamental valuation is not enough for fully determining stock prices. Other factors also influence stock market returns, such as the length of the stock-holding period (Campbell & Shiller, 1988; Rousseau & Rensburg, 2003). Future researchers should also consider those factors in their studies.

5.2. Recommendations

Investors are shown how to use these value investment methods as a part of stock selection, at least in a supporting way. Investors and market analysts are advised to adopt a long-term investment strategy to get higher returns.

Declaration of Competing Interest

There is no conflict of interest.

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