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EXPOSURE TO COMMON IDIOSYNCRATIC VOLATILITY ON STOCK RETURNS IN ASEAN STOCK MARKETS

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ABSTRACT

This research aims to examine whether the shocks from common idiosyncratic volatility (CIV) are priced in emerging markets, especially in Southeast Asia. We estimate idiosyncratic volatility employing an exponential generalized autoregressive conditional heteroskedasticity (GARCH) method to provide control for time-varying behaviour. Furthermore, we construct the CIV from the average of the monthly expected idiosyncratic volatility across the firms in our sample. After that, a 60-month rolling regression is conducted to estimate the CIV-beta to form a quintiles portfolio that is sorted by CIV-beta. This study found that there is no significant result for the CIV-beta investment strategy (long in highest CIV-beta and short in lowest CIV-beta), and showed that exposure to CIV is not priced in stock market returns in the Association of Southeast Asian Nations (ASEAN).

Keywords: Firm volatility; Idiosyncratic risk; Cross-section of stock returns; Emerging markets

1. INTRODUCTION

1.1. Background

The general theory with respect to risk and return is that the higher the risk, the higher the return, or that can mean there is positive risk premium. The assumption relating to risk-averse investors is that it induce investors to invest their money in assets that have no risk (risk-free assets) if the risky assets have zero risk premium. That is why positive risk premium theory is used to induce risk-averse to invest their money in risky assets rather than risk-free assets.

The capital asset pricing model (CAPM) explains that market risk, or systematic risk, is the only risk that is being priced. While risk that comes from individual assets is considered to not have any systematic effects on other assets, or is unsystematic risk. Some financial experts argue that the risks involved with stocks or assets, known as idiosyncratic risk, can be eliminated or minimized by portfolio diversification, so the total risk can become close to zero. Unfortunately, diversifying a portfolio is not easy, and not all investors have a diversified portfolio because of the market imperfections and also considering the psychology of each investor. Therefore, there is always compensation for the holders of undiversified portfolios.

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There are some empirical studies about idiosyncratic risks; unfortunately, the results of those studies are still inconsistent, even though most of the results of studies indicate the importance of idiosyncratic risk. Some researchers, such as (Xu & Malkiel, 2003), (Goyal & Santa-Clara, 2003), (Jiang & Lee, 2006), (Fu, 2009), (Huang, Liu, Rhee, & Zhang, 2010), and (Miffre, Brooks, & Li, 2013) explain that there is a positive relation between idiosyncratic volatility and stock returns. Meanwhile, Ang, Hodrick, Xing, & Zhang (2006) and Guo & Savickas (2006) maintain that there is a negative relation, and others even conclude that there is no significant relation between idiosyncratic volatility and stock returns (Bali & Cakici, 2008; Bradrania, Peat, & Satchell, 2015).

The differences in effects can be caused by several things, such as data frequency and the treatment of the data (Khovansky & Zhylyevskyy, 2013), or the proxy used for idiosyncratic risk (Vozlyublennaia, 2012). Even after using different weighting schemes, breakpoints, and different data and frequencies for analysing the effect of idiosyncratic volatility, Bali & Cakici (2008) still could not find a significant relation between stock returns and idiosyncratic volatility. Also, Bradrania at al. (2015) did not find any significant evidence after controlling the liquidity factor for which there is empirical evidence that it affects the relation between stock returns and idiosyncratic volatility (liquidity bias). A recent study reports that the commonality in idiosyncratic volatility can explain the cross-section of stock returns by measuring the exposure of stock returns against changes in common idiosyncratic volatility (CIV) or CIV-shocks (Herskovic, Kelly, Lustig, & Van Nieuwerburgh, 2016).

A study about the relation between idiosyncratic volatility and stock returns mostly focuses on developed markets; however, studies of emerging markets are still not often seen in the literature. Nartea, Ward, & Yao (2011) point out that the generalized results and conclusion about idiosyncratic volatility in developed markets cannot be equated to emerging markets. Their study finds a positive relation between idiosyncratic volatility and stock returns in four countries in Southeast Asia: Singapore, Thailand, Malaysia and Indonesia. This result gives some evidence that idiosyncratic volatility's effect on stock returns give different sign for the effect in some of the emerging markets in Asia and even developed markets, such as Singapore, than for the evidence from the US.

Similar to the evidence in the developed markets, the relation between idiosyncratic volatility and stock returns seems to be inconsistent. As a positive relation is found by Nartea at al. (2011), a negative relation between idiosyncratic volatility and stock returns is then found in emerging markets (Nartea, Wu, & Liu, 2013; Blitz, Pang, & van Vliet, 2013). In addition, Yunengsih & Husodo (2014) did not find any significant evidence of a relation between idiosyncratic volatility and stock returns in Indonesia.

This conclusion gives the reason why the exposure of CIV-shocks in emerging markets is interesting to study, as there is still no literature that brings evidence for other emerging markets about exposure to CIV-shocks. (Nartea at al., 2011) also show that an idiosyncratic-volatility-based trading strategy could result in trading profits in Southeast Asian stock markets, except for the Philippines. The potency of the growth in Asian emerging markets can be appealing to investors, and it is important to study those markets to gain comprehension about them.

Furthermore, there is evidence that the relation between idiosyncratic volatility and stock returns has a liquidity bias (Han & Lesmond, 2011; Bradrania at al., 2015). Both studies reveal that the significant relation between idiosyncratic volatility and stock returns identified in previous studies comes from the effect of liquidity on stock returns. Then, after controlling the liquidity factor, the relation between idiosyncratic volatility and stock returns becomes less significant (Han & Lesmond, 2011) or not significant (Bradrania at al., 2015); also, the value of the average stock returns in the portfolio is also higher than for a portfolio without liquidity control. This evidence also needs to be examined in order to find out whether the ability of idiosyncratic volatility to affect stock returns changes after controlling the liquidity.

1.2. Purpose of Research

The aim of this study is to examine the impact of the exposure to changes in CIV on firms' stock returns. Studies about CIV have recently been done on developed markets (US). CIV is a proxy for all firms' idiosyncratic volatility and is calculated by averaging idiosyncratic volatility across firms; this CIV term is introduced by Herskovic at al. (2016) who determine the synchronized idiosyncratic volatility of US firms.

Therefore, this study will explore how the exposure to changes in CIV (CIV-shocks) affects the average stock returns in Association of Southeast Asian Nations (ASEAN) emerging markets, whether the exposure to changes in CIV (CIV-shocks) has the same effect as in developed markets, and also compares the outcome of the exposure to CIV-shocks in ASEAN stock markets. Another aim of this study is to find out whether the exposure to changes in market volatility and liquidity can affect the relation between idiosyncratic volatility and stock returns in ASEAN stock markets.

2. LITERATURE REVIEW

2.1. Risk and Return Theory

Sharpe (1964) states the importance of market risk, which can systematically affect the stock (systematic risks), and how the risk from the firm's stocks is not considered to be important because of its effect is unsystematic (unsystematic risks). According to his study, risk on assets can be eliminated through portfolio diversification, so that the number of risks will not affect the yield from the portfolio. Depending on investors' preference, to create a balance on asset prices, he contends that it is not efficient if the investors hold assets that are not diversified because there is no consistency in the relation between expected returns for stocks and total risks. Meanwhile, market risk has a consistent relation with the expected returns.

The theory of capital asset pricing model (CAPM) has become established in many financial experts' mindsets, in which asset return is only determined by the systematic risks, or the risks that are related to economic activities, and that affect the market and the values of other assets (Sharpe, 1964). However, the model is not able to describe all of the phenomena that emerge for asset returns. According to Roll (1977), CAPM is not enough for a review of all phenomenon occurring between risks and returns.

Modigliani & Pogue (1974) describe the concept of the relation between risk and returns where unsystematic risk, or idiosyncratic risk, is not needed to explain this relation because the effect can be neutralized by portfolio diversification. However, erasing or reducing the effect of idiosyncratic volatility is not easy because of market imperfections, and not all investors hold a diversified portfolio or it can at least be said that the investors hold a portfolio that is not entirely diversified depending on the strategy that is chosen (Hueng & Yau, 2006). This will increase investors' risk-averse behaviour and increase the expected return for the investor as compensation for the risk they bear in the holding period.

2.2. Empirical Evidence of Idiosyncratic Risk

Malkiel & Xu (2002) show that the volatility of individual stocks increases over time. They also point out that idiosyncratic volatility has an effect on stock returns, if all investors do not have a diversified portfolio. Their study is based on Campbell, Lettau, Malkiel, & Xu (2001), which clarifies how volatile individual stocks are from the historical movements of volatility and the indication of decreasing correlation among stocks. According to (Campbell at al., 2001), a declining correlation among stocks indicates a higher chance of using a diversification strategy in order to form an efficient portfolio that can reach investors' goals.

Goyal & Santa-Clara (2003) report a positive relation between idiosyncratic risk and stock returns that uses average stock risk as a proxy. They explain that an investor holds non-traded assets that increase the risk of the investor, which then increases the investors' expectations for a bigger return as the compensation. Jiang & Lee (2006) examine the relation between dynamic idiosyncratic volatility and expected return using an autoregressive method to find the dynamic effect of idiosyncratic volatility. The result illustrates a positive and significant relation, even though the relation was not affected by firm size. The study also shows the linkage or relation between idiosyncratic volatility and fundamental variables.

Miffre at al. (2013) indicate that there is investor demand for additional returns when they are holding an undiversified portfolio. Their study explains that if idiosyncratic volatility on a portfolio that is sorted on size and is value weighted, the result is still robust even after controlling some factors, based on size, value, past performance, liquidity and total volatility.

Another finding, stocks with high idiosyncratic volatility have low average returns; this the opposite to the existing theory that points out the higher the risk, the higher the return (Ang at al., 2006, 2009). This research not only studies the idiosyncratic risk but also the aggregate volatility risk, or market risk. The result shows that the bigger the sensitivity to the volatility of risk gives a lower average return on a portfolio that is sorted on idiosyncratic volatility. Based on this result, they contend that the cause is the sensitivity of the stock to the aggregate volatility risk. They also argue that previous studies did not examine idiosyncratic volatility at the firm level or did not sort the portfolio based on idiosyncratic volatility. Another piece of evidence is from Guo & Savickas (2006) that also found the negative relations between idiosyncratic volatility and stock return. The difference of both study lie on the positive relation with aggregate volatility risk.

After verifying the weaknesses of the study of Goyal & Santa-Clara (2003), Bali, Cakici, Yan, & Zhang (2005) do not found any significant relation between idiosyncratic risk and stock returns in the portfolio measured using value weighting. In attempting to confirm the insignificant results, Bali & Cakici (2008) still do not find a significant relation between idiosyncratic risk and stock returns. Even after analysing it with different methods of portfolio sorting, such as different weighting schemes (equal and value weighting), and the use of different breakpoints (Center for

Research in Security Prices [CRSP] and New York Stock Exchange [NYSE] breakpoints), different data sources (CRSP and NYSE data) and different data frequencies (daily and monthly), the only significant results they find is in the value-weighted portfolio formed with CRSP daily data and CRSP breakpoints, which suggests it is having many small-sized stocks that has driven the negative relation.

Bradrania at al. (2015) also explain that, even after controlling the liquidity cost, which is suspected to be the cause of the positive relation between idiosyncratic risk and returns, the result do not confirm any significant relation. This result is more or less similar to the results from Bali at al. (2005) and Bali & Cakici (2008).

Fu (2009) uses an exponential generalized autoregressive conditional heteroskedasticity (EGARCH) model to estimate the expected idiosyncratic volatility and exposes a positive relation between idiosyncratic volatility and stock returns. He argues that the idiosyncratic volatility that is usually used in the previous studies is realised idiosyncratic volatility, and is not the expected idiosyncratic volatility that has a time-series property or is volatile over time. This result contradicts the conclusions from Ang at al. (2006, 2009) that show a negative relation.

Fu (2009) argues that the expected idiosyncratic volatility used should be for the same period as the expected return, not on a lagged one-month period, and the negative relation in Ang at al.'s (2006, 2009) conclusion could be caused by the effect of return reversal. This presumption is verified by Huang at al. (2010). The negative relation is revealed to not be significant after controlling the return reversal. This result clearly shows that realised idiosyncratic volatility is not suitable for proving the relation between idiosyncratic volatility and stock returns.

Other studies about the differences in realised idiosyncratic volatility and expected idiosyncratic volatility come from (Peterson & Smedema, 2011) and (Fink, Fink, & He, 2012). Both of them compare the results from Ang at al. (2006, 2009) and Fu (2009). Peterson and Smedema (2011) argue that the negative relation is still robust because of the January effect, a seasonal stock price increase during the month of January. Meanwhile Fink at al. (2012) did not identify any negative relation for realised idiosyncratic volatility, but find a positive relation after controlling the return reversal.

Vozlyublennaia (2012) examines the relation between idiosyncratic risk and stock returns using a GARCH-in-mean model, and confirms there is an indication that around 15% of securities have a significant relation for risk and return, at the 5% level of confidence, and this proportion has time-series variation. The significant relation in this study has a different sign depending on the proxy of idiosyncratic risk used to explain idiosyncratic risk.

In addition, Khovansky & Zhylyevskyy (2013) maintain that the positive or negative relation between idiosyncratic risk and stock returns depends on the data frequency used for the analysis, whether it was daily, weekly, monthly, quarterly or annually. They did this analysis because they argue that every researcher was using a different data frequency, which resulted in a different outcome. They conclude that daily data tends to show a positive relation while other frequency data tends to a show negative relation.

One of the latest studies about idiosyncratic volatility states that the idiosyncratic volatility of US firms is synchronized. This research, done by Herskovic at al. (2016), reveals the commonality in the factor structure of idiosyncratic volatility is because there is a synchronization among firms' idiosyncratic volatilities and explains the existence of CIV across firms. Their study shows that CIV is one of the asset pricing factors in the US stock market, and the lower the exposure to CIV-shocks (negative CIV-beta), the higher the stock returns, rather than the higher the CIV-beta. In addition to the evidence of a relation with stock returns, CIV has a relation with household labour income.

2.3. Idiosyncratic Volatility in Emerging Markets

Nartea at al. (2011) study the relations of idiosyncratic volatility and stock returns in Southeast Asian emerging markets: Malaysia, Singapore, Thailand, Indonesia and the Philippines. The study verifies the positive relation between idiosyncratic risk and stock returns, except for the Philippines, using the standard deviation of the residual of a Fama-French regression as the idiosyncratic volatility. However, Nartea at al. (2013) find new evidence using stock data from China, and confirm a negative relation between idiosyncratic risk and stock returns in emerging markets. They argue that idiosyncratic volatility in China is period specific, coinciding with regime shifts and structural market reforms.

Similar to Ang at al. (2006, 2009), the relation of idiosyncratic volatility and stock returns in Indonesia is a significant negative relation (Murhadi, 2013). He argues that the result implies that investors tend to focus on firms with lower risk when they cannot form a diversified portfolio to minimize the effect of idiosyncratic risk. However, Yunengsih and Husodo (2014) give evidence that idiosyncratic risk in Indonesia does not matter because they find no significant results in their study.

Other evidence from emerging markets comes from Blitz at al. (2013), as they reveal a significant negative relation between idiosyncratic risk and returns. The study also finds that the relation between idiosyncratic risk and returns was more significantly strong when the volatility was used in the analysis rather than the beta.

2.4. Idiosyncratic Volatility and Liquidity

Idiosyncratic volatility has a negative relation with the liquidity factor, although both of these factors have the same ability to explain stock markets (Spiegel & Wang, 2005), not only in developed markets but also in emerging markets, such as Indonesia (Murhadi, 2013). Furthermore, the evidence shows that liquidity can affect the ability of idiosyncratic volatility to explain stock returns (Han & Lesmond, 2011).

Han and Lesmond (2011) argue that the significant relation between idiosyncratic volatility and stock returns is being affected by liquidity. In order to prove their argument, Han and Lesmond (2011) study the relation between idiosyncratic volatility and stock returns by controlling the liquidity factor to determine whether the stock returns and the significant relation change after liquidity is controlled. The study observes that the relation becomes less significant after controlling the liquidity, and that the portfolio stock returns are higher. Bradrania at al. (2015) also conducted a study using a more advanced method and find no significant evidence of a relation between idiosyncratic volatility and stock returns after controlling the liquidity. This finding is in accordance with Bali and Cakici's (2008) research that also demonstrates there is no significant evidence after screening the portfolio using liquidity.

3. METHODOLOGY

3.1. Data

The stock price data that is used in this study consists of monthly frequency data for firms that are listed on each market, and data on each country's stock market index. The data used is secondary data, with a sample of non-financial firms that are still active in each market where the firms are listed. The sample period is from January 2006 to August 2016, and is to explore the effect of CIV-beta on stock returns in the last ten years.

3.2. Research Plot

This study focuses on how firms' exposure to CIV can affect firms' stock return. The regression model used to get the residuals is the market model; this model is used because, according to Herskovic at al. (2016), the result and the conclusion from the market model, FF-3 model, and the first five principal components are quantitatively similar and qualitatively the same.

However, different from the previous studies, the idiosyncratic volatility in this study will be obtained using the EGARCH method, which is the method used by Fu (2009) to obtain idiosyncratic volatility that controls variation over time. This different method is used because if Herskovic at al.'s (2016) opinion about idiosyncratic volatility inheriting time-varying volatility from the common factor of return is correct, then the proxy of idiosyncratic volatility should be the expected idiosyncratic volatility that has a time-series property rather than the realised idiosyncratic volatility.

After obtaining the idiosyncratic volatility, the next step is averaging the idiosyncratic volatility across the firms to get the monthly CIV. The changes in CIV per month then become CIV-shocks (CIVs). These shocks are used in an excess return regression against CIVs and market-volatility shocks (MVs) to get the exposure to changes in CIV (CIV-beta) on firms' stock returns. Then, the portfolio is formed into quintiles and sorted based on the CIV-beta for each month. This portfolio will be sorted from lowest CIV-beta to the highest CIV-beta, and from this portfolio it can be seen how the average stock return reacts to changes in CIV.

3.3. Research Method

The idiosyncratic volatility that is estimated in this study is an idiosyncratic volatility that varies over time; according to Fu (2009), expected idiosyncratic volatility varies and is volatile over time, so it can produce a positive relation between idiosyncratic volatility and stock returns. Expected idiosyncratic volatility is estimated using the EGARCH (p,q) method suggested by Fu (2009).

$$(r_i - r_f)_t = \alpha + \beta_{i,t}(R_m - r_f)_t + \varepsilon_{i,t} \quad (1)$$
$$\varepsilon_{i,t} \sim N(0, \sigma_{it}^2)$$
$$ln\ \sigma_{it}^2 = a_i + \sum_{l=1}^{p} b_{i,l} ln\ \sigma_{it}^2 + \sum_{k=1}^{q} c_{i,k} \left\{\theta\left(\frac{\varepsilon_{i,t-k}}{\sigma_{i,t-k}}\right) + \gamma\left[\left|\frac{\varepsilon_{i,t-k}}{\sigma_{i,t-k}}\right| - (\frac{2}{\pi})^{1/2}\right]\right\} \quad (2)$$

The idiosyncratic volatility that is estimated using the previous model is the variance of the residual from the market model regression. Residual εi,t is assumed to be normal, with a mean of zero and conditional variance of σ_{it}^2. This model has several advantages over the GARCH model: it does not restrict parameter values to avoid negative variance and captures the asymmetry effect on conditional volatility (Brooks, 2014). Another parameter that will be measured for its effect on firms' stocks is market volatility (MV). MV will explain the impact of the exposure to changes in MV on firms' stock returns.

After obtaining the idiosyncratic volatility, the CIV is calculated as the average idiosyncratic volatility across firms:

$$CIV = \frac{1}{N_m} \sum_{i=1}^{n} expIVOL_{i,m} \quad (3)$$

Where

CIV	= common idiosyncratic volatility
$expIVOL_{i,m}$	= expected idiosyncratic volatility of stock i in month m
N_m	= number of firms each month

Next, the CIV-beta will be obtained by regressing the excess returns on CIV-shocks and MV-shocks using a 60-month rolling-window regression:

$$(r_i - r_f)_t = \alpha + \beta_{CIVs_t} CIVs_t + \beta_{MVs_t} MVs_t + \varepsilon_{i,t} \quad (4)$$

Equation 4 explains the effect of CIV-shocks on excess returns $(R_i - r_f)_t$ for stock i in period t. $CIVs_t$ is the CIV-shocks in period t. Furthermore, MVs_t is the MV-shocks in period t. Parameter β_{CIVs_t} is the exposure of firms' to changes in CIV, which is called CIV-beta, and β_{MVs_t} is the exposure of firms' to changes in MV, which is called MV-beta. These betas are used for sorting the portfolio each month to find the average returns for the portfolio quintiles.

The control of liquidity factors on the CIV-beta portfolio is performed in the same way as in Herskovic at al.'s (2016) study to control the effect of MV change exposure. Portfolios are double sorted by liquidity and idiosyncratic volatility, or CIV-beta (Ang at al., 2006; Bali & Cakici, 2008; Bradrania at al., 2015). Subsequently, each share of quantile CIV-beta in each quantile of liquidity is collapsed to become a single sorted quantile portfolio.

The liquidity proxy used is ILLIQ (Amihud, 2002), which is calculated by averaging the ratio of the absolute value of stock returns to the volume of stock dollars in a given period:

$$\mathrm{ILLIQ}_{\mathrm{i,m}} = \frac{1}{\mathrm{D}_{\mathrm{i,m}}} \sum_{\mathrm{t=1}}^{\mathrm{D}_{\mathrm{i,y}}} \frac{|\mathrm{R}_{\mathrm{i,m,d}}|}{\mathrm{VOLD}_{\mathrm{i,m,d}}} \quad (5)$$

Equation 5 is the illiquidity equation, where $D_{i,m}$ is the number of days of data availability for the stock i in month m. $|R_{i,m,d}|$ is the absolute value of stock i in m days d. $VOLD_{i,m,d}$ is the dollar volume or trading volume of stocks in US dollars for stock i in m days d.

4. RESULTS AND DISCUSSIONS

This study will attempt to find whether exposure to changes in CIV matters and can be priced in ASEAN stock markets. Based on Herskovic at al.'s (2016) research, firm-level risk has a similar factor structure to the total risk for stock returns and gives evidence of synchronized volatility across US firms. This synchronized volatility gives Herskovic at al. (2016) their conclusion that there is commonality in idiosyncratic volatility and the average idiosyncratic volatility across firms is a sufficient proxy of idiosyncratic volatility, known as CIV. According to Herskovic at al. (2016), the exposure to CIV-shocks is priced and has a negative relation to stock returns. However, since there is inconsistency in the studies on idiosyncratic volatility and there is a lack of evidence on emerging markets, this gives motivation to others to study this beta effect of CIV using different methods and different market criteria. The following table details the descriptive statistics for the variables used in this study.

Table 1 gives the descriptive statistics for CIV over the 2006–2016 period across the ASEAN stock markets: Indonesia (IND), Thailand (THAI), Malaysia (MAY) and Singapore (SGP).

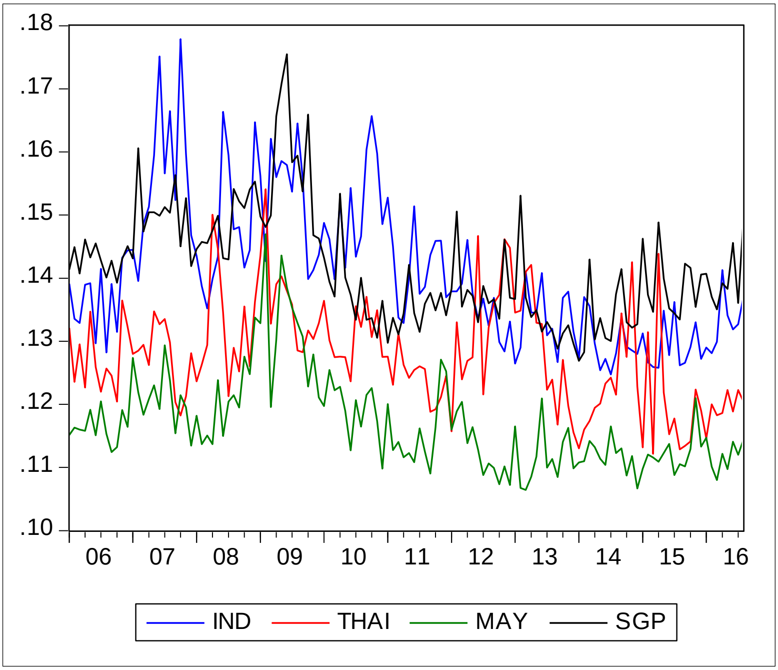
The descriptive statistics in Table 1 give the mean, standard deviation, and maximum and minimum values for CIV in the period of analysis. The mean columns give a simple picture of the CIV across the markets; the lowest CIV is seen for Malaysia's (MAY), with a CIV value around 0.117 per month, and the Singapore and Indonesia markets seems to have the highest CIV among the four markets, with the value of CIV more than 0.14 per month. Singapore, as a developed market in Southeast Asia, seems to have a high CIV compared to other markets. The gap between the median data and the mean is not that big, which means that the data is not being driven by outliers. The historical movements of CIV across ASEAN markets can be seen in the Figure 1.

Table 1: Descriptive Statistics of Common Idiosyncratic Volatility (CIV)

	IND	**THAI**	**MAY**	**SGP**
Mean	0.141	0.128	0.117	0.142
Median	0.140	0.127	0.115	0.140
Maximum	0.178	0.154	0.147	0.176
Minimum	0.125	0.112	0.106	0.127
Std Dev.	0.012	0.009	0.008	0.009
Skewness	0.864	0.499	1.369	1.028
Kurtosis	3.238	3.005	5.302	4.240

Source: Research analysis

Figure 1: History of Common Idiosyncratic Volatility (CIV) across ASEAN Stock Markets over the 2006–2016 period



Source: Research analysis

Figure 1 shows the pattern for CIV across the ASEAN markets over a ten-year period. Overall, the pattern does not reveal any trend on CIV movements in Indonesia and Singapore, though it is slightly downward. Meanwhile, Thailand and Malaysia's CIV seems to show a flat and slightly downward trend over time. The benefits of diversification are implied by the upward trend in idiosyncratic volatility that suggests a decreasing correlation among stocks as well. A decreasing correlation among stocks means that portfolio diversification among stocks will be easier and gives more benefits to investors (Campbell at al., 2001).

Generally, a similar pattern of CIV is demonstrated across the ASEAN stock markets. Moreover, there is a highly volatile pattern in 2008–2009. The levels of CIV across the ASEAN stock markets are not much different; the movements also seem to overlap. The CIV level in Singapore and Indonesia are the highest among these markets and similar to the depiction in the descriptive statistics above, Malaysia has the lowest CIV and the volatility tends to be flat, which is similar to the volatility in Thailand. Comparing those CIVs with the CIV of the US in Herskovic at al.'s (2016) study identifies a big difference in CIV level. The CIV level of the US is much higher than the CIV level of Singapore in this study.

The idiosyncratic volatility of US firms is higher than for other countries (Bartram, Brown, & Stulz, 2012). Despite that, the level of idiosyncratic volatility does not show that the risk is bad based on the higher idiosyncratic volatility or good based on the low level of idiosyncratic volatility. Highly volatile markets should be analysed to determine whether the highly volatile state is a good or bad condition for firms and markets. Bartram at al. (2012) argue that high volatility in the US is expected to be good volatility, as the firms become more risky prospects because of riskier decision-making that increases the performance and benefits of firms.

In order to examine the effect of CIV on the stock returns of ASEAN markets, this study follows the method of Herskovic at al. (2016), which identifies the effect of beta or exposure to change in the CIV on the average stock returns. The easiest method to illustrate the effect of CIV-beta on stock returns is by forming a portfolio sorted on CIV-beta or the independent variables, then applying an investment strategy that is long on the top portfolio (with the highest CIV-beta) and short on the bottom portfolio (with the lowest CIV-beta).

The portfolios construction uses two variables that are believed to have relations with stock returns, CIV-beta and MV-beta (Herskovic at al., 2016). These betas are estimated from regressing the excess returns of individual stocks on CIV-shocks and MV-shocks (changes in CIV and MV) using a 60-month rolling-window regression to get different coefficients for CIV-shocks and MV-shocks each month. These betas will be used to sort stocks' excess returns into quintiles of equally weighted portfolios.

Table 2: Descriptive Statistics of Variables

Variables	Mean	Std Dev.	Median	N
Xret	0.014	0.411	-0.001	193,792
CIV-beta	1.450	6.562	1.060	193,792
MV-beta	-1.409	5.841	-1.230	193,792

Source: Research analysis

Table 2 gives the descriptive statistics of the variables that are used in the quintiles' portfolio formation, sorted on CIV-beta and MV-beta. Xret is the stock returns in excess of the risk-free rate each month; CIV-beta is the exposure to shocks from CIV estimated using a 60-month rolling-window regression for excess returns, with CIV-shocks and MV-shocks; and MV-beta is exposure to shocks from MV estimated from a 60-month rolling-window regression for excess returns, with CIV-shocks and MV-shocks.

The mean for monthly stock returns in excess of the risk-free rate return is around 1.4% per month. Meanwhile, the mean of the CIV-beta is about 1.45 and for MV-beta it is the reverse of the value for CIV-beta, which is around -1.41 per month. These values show that the average value of CIV-beta is a positive value, and this implies that the excess return will rise when CIV rises in ASEAN markets, which is the pay-off from the highly volatile state. Meanwhile, the average value of MV-beta is a negative value, which implies that the excess return will fall when MV rises, giving the reverse of the impact from CIV.

Table 3 shows the portfolios formed from the CIV-beta using different methods of sorting. Panel A is the portfolio formed with a one-way sort on CIV-beta. Meanwhile, Panel B is a one-way sort on CIV-beta, controlling MV-beta, which is created by following the steps from Herskovic at al. (2016) and collapsing the double-sorted portfolio on MV-beta and CIV-beta. Table IV is a double sort or two-way sort on CIV-beta and MV-beta. This portfolio-based approach is the easiest way to interpret the returns on feasible investment strategies; sorting stocks into portfolios based on variables gives a simple picture if the returns are increasing or decreasing based on independent variables. The most feasible investment strategy is long in highest CIV-beta and short in lowest CIV-beta.

The portfolio in Panel A, from a one-way sort on CIV-beta, shows decreasing average returns in CIV-beta. The stocks on the lowest CIV-beta (CIV1) give more returns than the portfolio in the last quintile (with the highest CIV-beta). Overall, the results demonstrate that the returns are decreasing in CIV-beta; this can be seen in the CIV-beta investment strategy (5-1), which reveals similar results to those in Herskovic at al. (2016), where the CIV-beta premium is a negative value. Similar results are seen in Panel B, for the CIV-beta sorted portfolio, controlling MV-beta; even after controlling the exposure to MV, the premium for CIV-beta still does not change its value sign.

The pattern are different to those from Herskovic at al. (2016) for US idiosyncratic volatility, which has an average return pattern that linearly decreases in CIV-beta. Fu (2009) suggests that patterns of returns that linearly decreasing across the idiosyncratic volatility base portfolio are completely driven by small stocks with high idiosyncratic volatility. The results of Herskovic at al.'s (2016) research may have followed this suggestion, as they did not report robust results that explain groups of small stocks.

Table 3: Portfolios Formed on Common Idiosyncratic Volatility (CIV-beta)

Panel	CIV1 (*low*)	CIV2	CIV3	CIV4	CIV5 (*high*)	Q5–Q1
A: One-way sort on CIV-beta						
Indonesia	-3.615	-6.652	-4.163	-1.077	-4.728	-1.113 (0.036)
Thailand	-0.882	0.665	1.667	1.957	-3.562	-2.681 (-0.166)
Malaysia	-3.220	-2.144	-0.607	-3.243	-6.257	-3.037 (-0.276)
Singapore	-5.655	-2.951	-1.308	-4.616	-9.975	-4.320 (-0.241)
B: Sort on CIV-beta controlling MV-beta						
Indonesia	-3.609	-4.162	-4.355	-1.210	-5.641	-2.032 (-0.084)
Thailand	-1.833	2.334	2.305	-0.181	-2.883	-1.049 (-0.017)
Malaysia	-3.964	-1.530	-1.147	-2.023	-6.412	-2.448 (-0.172)
Singapore	-7.083	-3.268	-2.910	-3.475	-10.927	-3.844 (-0.264)

Source: Research analysis

Table 3 shows the average excess returns in annual percentage form for the portfolios that are sorted on monthly CIV-beta, or exposure to changes in CIV, for the 2006–2016 period. Panel A reports the equally weighted, average excess returns for the sample stocks from a one-way sort on CIV-beta. Panel B reports equally weighted, average excess returns for the sample stocks from a one-way sort on CIV-beta, controlling MV-beta. CIV1 is the lowest CIV-beta quintile and CIV5 is the highest CIV-beta quintile. Q5–Q1 is the CIV-beta premium from the CIV-beta investment strategy that is long in CIV5 and short in CIV1; the t-statistics are given in parentheses.

Herskovic at al. (2016) explains that stocks in the first quintile portfolio (with the lowest CIV-beta) tend to have a negative CIV-beta, indicating that the value of stocks in the first quintile tends to fall when CIV rises. Meanwhile, stocks in the last quintile have a positive CIV-beta and tend to hedge value when CIV rises. This gives the assumption that the first quintile portfolio has a higher risk than the last quintile portfolio.

Even though they are similar, the CIV-beta premium is not significant statistically: no t-statistics value exceeds the critical value of t-stat. This gives another implication that a trading strategy based on exposure to CIV, or even the MV, is not considered by investors, and investors only consider a trading strategy based on market factors in ASEAN stock markets. Another thing that is implied by this research is that there are differences in the results and conclusions between the studies of idiosyncratic risk in developed and emerging markets.

Table 4 reports the excess returns in a double-sorted portfolio on CIV-beta and MV-beta (5 by 5). These portfolios are the same portfolio as the ones described for controlling MV-beta. The results are similar to Table 3, along with the significance of the CIV-beta premium, where the low CIV-beta quintiles earn higher average returns within the MV-beta quintiles in each of the ASEAN stock markets. However, in some MV-beta quintiles, especially for Indonesia, the CIV-beta premium seems to have a positive value.

Even though the study uses the expected idiosyncratic volatility to form the CIV, the results still show a non-linear decreasing pattern of returns across the CIV-beta portfolios, and the CIV-beta premium is not significant statistically. This could be caused by the return reversal from the previous month that has positive returns, especially from small stocks that have high idiosyncratic volatility, as argued by Fu (2009).

Table 4: Double-sorted Portfolios for CIV-beta and MV-beta

	CIV1 (*low*)	CIV2	CIV3	CIV4	CIV5 (*high*)	Q5–Q1
Panel A: Indonesia						
MV1 (*low*)	-10.989	-3.659	-5.110	3.585	-5.376	5.613 (0.647)
MV2	-9.764	-2.516	-2.032	5.297	-3.603	6.161 (0.699)
MV3	-6.948	-0.750	-8.132	-6.073	-7.150	-0.202 (0.195)
MV4	-5.675	-6.276	-4.294	-8.365	-2.033	3.642 (0.440)
MV5 (*high*)	0.469	-8.295	-11.333	-5.150	-8.506	-8.975 (-0.826)
Q5-Q1	11.459 (1.042)	-4.636 (-0.599)	-6.223 (-0.536)	-8.734 (-0.894)	-3.130 (-0.449)	-

	CIV1 (*low*)	CIV2	CIV3	CIV4	CIV5 (*high*)	Q5–Q1
Panel B: Thailand						
MV1 (*low*)	-6.683	-0.202	3.943	-6.398	-11.064	-4.380 (-0.317)
MV2	-0.848	0.551	3.112	4.133	-3.199	-2.352 (-0.193)
MV3	-2.002	5.788	1.877	1.957	-2.880	-0.878 (-0.071)
MV4	-5.064	0.342	2.695	-1.689	-1.711	3.352 (0.548)
MV5 (*high*)	-2.47	-3.979	-3.292	-3.533	-7.467	-4.997 (-0.382)
Q5-Q1	4.214 (0.291)	-3.777 (-0.648)	-7.235 (-1.002)	2.865 (0.169)	3.596 (0.251)	-
Panel C: Malaysia						
MV1 (*low*)	-12.069	-2.261	-0.811	-4.807	-14.235	-2.166 (-0.144)
MV2	-4.064	-1.640	-3.676	-2.877	-4.544	-0.480 (0.042)
MV3	-0.278	0.605	0.672	-2.264	-4.164	-3.886 (-0.319)
MV4	-1.003	-1.270	-0.846	-1.391	-6.986	-5.983 (-0.505)
MV5 (*high*)	-7.199	-4.730	-3.921	-5.679	-7.918	-0.718 (0.014)
Q5-Q1	4.869 (0.573)	-2.469 (-0.352)	-3.110 (-0.364)	-0.872 (-0.105)	6.317 (0.621)	-
Panel D: Singapura						
MV1 (*low*)	-6.406	-6.824	-5.696	-2.886	-14.60	-8.194 (-0.579)
MV2	-1.290	-4.986	0.908	-0.597	-13.28	-11.99 (-0.855)
MV3	-6.731	2.534	1.097	-1.954	-6.413	0.319 (0.114)
MV4	-3.590	-5.130	-1.657	-4.314	-8.528	-4.938 (-0.321)
MV5 (*high*)	-15.46	-9.539	-5.976	-8.213	-23.62	-8.165 (-0.683)
Q5-Q1	-9.051 (-0.849)	-2.716 (-0.317)	-0.279 (-0.184)	-5.327 (-0.473)	-9.021 (-0.809)	-

Source: Research analysis

Table 4 shows the average excess returns in annual percentage form for the double-sorted portfolios that are sorted on monthly CIV-beta and MV-beta for the 2006–2016 period. Panels A–D report equally weighted, average excess returns for the sample stocks in Indonesia, Thailand, Malaysia and Singapore for the aforementioned double-sorted portfolios. CIV1 is the lowest CIV-beta quintile and CIV5 is the highest CIV-beta quintile. MV1 is the lowest MV-beta quintile and MV5 is the highest MV-beta quintile. Q5–Q1, in the last column of each panel, is the CIV-beta premium from the CIV-beta investment strategy that is long in CIV5 and short in CIV1; the t-statistics are given in parentheses. Q5–Q1, in the last row of each panel, is the MV-beta premium from the MV-beta investment strategy that is long in MV5 and short in MV1; the t-statistics are given in parentheses.

Stock returns can be affected by many factors, such as size, book-to-market ratio, liquidity, etc. Liquidity is being considered to be an important factor for stock returns, since liquidity is the response of price to asset trading activity (Amihud, 2002). A change in asset prices can affect the returns volatility, not only in developed markets but also in emerging markets (Lesmond, 2002). Spiegel and Wang (2005) find that idiosyncratic risk and liquidity has a negative relation, and argue that idiosyncratic volatility has a stronger effect on stock returns than liquidity. In contrast, Han and Lesmond (2011) examine the pricing ability of idiosyncratic volatility and maintain that controlling the liquidity can decrease the idiosyncratic volatility's ability to explain stock returns.

Based on the previous explanation, this research also aims to find out whether the effect of CIV-beta on stock returns can change after controlling the liquidity. In order to see whether liquidity has an effect on a CIV-beta portfolio, the portfolio is then two-way sorted based on illiquidity as a proxy for the liquidity factor (Amihud, 2002) and CIV-beta. Then, the double-sorted portfolio is collapsed in order to form a single sort on CIV-beta; the method of sorting is the same as for the double sort of the portfolios on MV-beta and CIV-beta.

Table 5: Portfolio Sort on CIV-beta Controlling the Liquidity

	CIV1 (*low*)	CIV2	CIV3	CIV4	CIV5 (*high*)	Q5–Q1
Indonesia	0.281	0.164	0.178	0.207	0.160	-0.1213 (-0.636)
Thailand	0.124	0.193	0.184	0.276	0.159	0.035 (0.357)
Malaysia	0.128	0.095	0.136	0.112	0.099	-0.029 (-0.156)
Singapore	0.120	0.082	0.063	0.099	0.115	-0.006 (0.084)

Source: Research analysis

Table 5 reports the average excess returns in annual percentage form for portfolio that is sorted on CIV-beta, or exposure to changes in CIV, controlling the liquidity for the 2006–2016 period. CIV1 is the lowest CIV-beta quintile and CIV5 is the highest CIV-beta quintile. Q5–Q1 is the CIV-beta premium from the CIV-beta investment strategy that is long in CIV5 and short in CIV1; the t-statistics are given in parentheses.

Table 5 gives the portfolios that are sorted on CIV-beta, controlling the liquidity factor. The CIV-beta premium in each market still has a negative value, except for Thailand's stock market, which shows a positive CIV-beta premium. However, the same as with the previous results, the CIV-beta premium is statistically not significant. This is different from the conclusion of Spiegel and Wang (2005), who argue that the pricing ability of idiosyncratic volatility is stronger than the pricing ability of liquidity. This research shows that, even after controlling the liquidity, exposure to CIV is still not priced in ASEAN stock markets. Similar to the findings of Han and Lesmond (2011), and Bradrania at al. (2015), the premium from the investment strategy after controlling the liquidity is higher than the premium before controlling the liquidity. Even the CIV-beta premium of Thailand becomes positive after controlling the liquidity, implying that the liquidity premium in Thailand is higher or has more impact on stock returns than idiosyncratic volatility.

Even after using the EGARCH method to estimate the expected idiosyncratic volatility and controlling the effect of liquidity, the exposure to idiosyncratic volatility does not have any significant effect on average stock returns in ASEAN stock markets. This result is in accordance with Bali and Cakici's (2008), and Bradrania at al.'s (2015) research, which reveals no significant evidence of a relation between stock returns and idiosyncratic volatility. This indicates that the CIV factor is not considered to be a pricing factor for stock returns, and investors prefer market-based trading strategies rather than idiosyncratic-risk trading strategies in the ASEAN stock markets.

The volatile movements of CIV show that the changes in CIV in the ASEAN stock markets are not much different between countries. The shocks to CIV are quite stable in ASEAN stock markets, which is why the effect or sensitivity of CIV has a small impact on stock returns in ASEAN countries. The exposure to changes in CIV is not considered to be a big risk in ASEAN markets.

5. CONCLUSION

Idiosyncratic volatility is a firm-level volatility that is unsystematic and can be minimized by diversification of the portfolio. Unfortunately, diversification is not easy to accomplish, as not all investors hold a balanced, diversified portfolio. Much literature gives evidence of the importance of idiosyncratic volatility as the common factor in stock returns. Recently, common idiosyncratic volatility (CIV) is being calculated as the average of idiosyncratic volatility across firms. This CIV is a representation of the commonality in idiosyncratic volatility over time and across firms, and the evidence states that CIV is one of the common factors in stock returns in US markets.

Even if the CIV is priced in the cross-section of stock returns in the US, which is a developed market, the sensitivity to change in CIV is not the same if the factor is analysed in an emerging market. This study found that the average stock returns decreases in CIV-beta, though the CIV-beta premium is statistically not significant even after controlling the exposure to market volatility (MV) and liquidity. This result confirmed that changes in CIV or CIV-shocks are not priced in the cross-section of stock returns in the Association of Southeast Asian Nations (ASEAN) stock markets. Investors may not consider that there are any benefits in applying an idiosyncratic-volatility-based trading strategy in ASEAN stock markets.

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