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Risk-Averse Behaviour in Emerging Markets: The Role of Economic Indicators, Bank Characteristics and Developed Markets

(*Gelagat Mengelak Risiko dalam Pasaran Baru Muncul: Peranan Penunjuk Ekonomi, Ciri-ciri Bank dan Pasaran Maju*)

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ABSTRACT

This study aims to examine the impact of economic indicators and bank characteristics on investors' risk-averse behaviour in emerging countries. It further analyses the influence of the developed markets on the risk-averse behaviour of the emerging markets. This study specifically explores the tendency of risk-averse behaviour among investors, as described in the Prospect theory. Using India, Indonesia, Malaysia and China as the sample countries over the 2010-2021 period, this study employs panel data regression with excess return, three-factor alpha, five-factor alpha and six-factor alpha models for robustness testing. The results showed that the economic indicators, namely IMF growth forecast, GDP growth rate, and real interest rate significantly impact risk-averse behaviour. Bank characteristic of non-performing loans also explains risk-averse behaviour. In addition, the US as a developed market is significantly correlated with investors' behaviours in emerging markets. The results of the quantile regression showed that Malaysian investors have the highest tendency towards risk-averse behaviour, followed by Indonesia, China and India. This study may assist regulators, policymakers and practitioners in determining the tendency of risk-averse behaviour. The respective parties should regularly monitor, control and regulate investors' risk aversion as the contagion effect of extreme irrational behaviour can lead to market crash and financial crisis.

Keywords: Investors' reaction; bank characteristics; emerging market; prospect theory; risk-averse

ABSTRACT

Kajian ini bertujuan untuk mengkaji kesan faktor ekonomi dan bank faktor terhadap tingkah laku mengelak risiko pelabur di negara sedang pesat membangun, iaitu India, Indonesia, Malaysia dan China. Faktor ekonomi US dan bank faktor terhadap pasaran baru muncul juga ditentukan. Kajian ini meneroka kecenderungan tingkah laku mengelak risiko di kalangan pelabur, seperti yang diterangkan dalam teori prospek. Menggunakan India, Indonesia, Malaysia dan China sebagai negara sampel sepanjang 2010-2021, kajian ini menggunakan regresi data panel dengan pulangan berlebihan, model alfa tiga faktor, alfa lima faktor dan alfa enam faktor untuk ujian kekukuhan. Keputusan menunjukkan bahawa faktor ekonomi seperti ramalan pertumbuhan IMF, kadar pertumbuhan KDNK dan kadar faedah sebenar memberi kesan ketara kepada tingkah laku mengelak risiko. Pinjaman tidak berbayar adalah satu-satunya pembolehubah faktor bank faktor yang menjelaskan tingkah laku mengelak risiko. Kesan US sebagai pasaran maju amat berkait rapat dengan gelagat pelabur dalam pasaran baru muncul. Keputusan regresi kuantil menunjukkan bahawa pelabur Malaysia mempunyai kecenderungan tertinggi ke arah tingkah laku mengelak risiko, diikuti oleh Indonesia, China dan India. Kajian ini menyumbang kepada pengawal selia, penggubal dasar dan pengamal dalam menentukan kecenderungan tingkah laku mengelak risiko. Pihak masing-masing hendaklah sentiasa memantau, mengawal dan mengawal selia penghindaran risiko pelabur kerana kesan penularan daripada tingkah laku tidak rasional yang melampau boleh membawa kepada kejatuhan pasaran dan krisis kewangan.

Keywords: Reaksi pelabur; ciri-ciri bank; pasaran baru muncul

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INTRODUCTION

Studies on the decision-making process of investors in behavioural finance are controversial as compared with traditional finance. Kahneman and Tversky (1992) proposed the prospect theory to describe the abnormal behaviour of investors in perceiving differently the gains and losses. They argue that investors are risk-averse,

placing more weight on gains and generating a higher emotional impact in a loss. In other words, investors hate to lose their investment in the markets. Hence, the prospect theory is also known as the "loss-aversion theory" to explain the risk-averse behaviour of investors. This study aims to examine the impact of economic and bank-specific factors on investors' risk-averse behaviour in emerging markets. The impact of US economic and bank factors on risk-averse behaviour in other countries will be investigated. A comparative analysis of the tendencies of risk-averse behaviour between a few emerging markets can be established to indicate the dissimilar behaviours of investors in different markets.

This study contributes to academia in enhancing the existing literature by determining the impact of economic and bank factors on risk-averse behaviour as well as the impact of these factors from the US on investors' behaviours in emerging markets. Many studies have confirmed risk-averse behaviour and argued that investors' psychology and characteristics are risk-aversion determinants. Nonetheless, this study differs from previous studies investigating external factors' impact on risk aversion. Stricter rules and regulations should be implemented to target extreme risk-averse behaviour, which can lead to mispricing of securities and market crash. Investors and analysts could also benefit from knowing the determinants of risk-averse behaviours especially in formulating robust investment decisions.

The determinants of risk-averse behaviour can be broadly categorised into two causes; investors' characteristics (age, gender and financial literacy) and economic variables. Past studies have shown that macroeconomic variables such as GDP growth rate, real interest rate, unemployment, are often correlated to risk-averse behaviour (see Ciccarone et al. 2020; Gregoriou et al. 2019). Other potential determinants however, such as bank-specific factors and coincident economic indicators, have hardly been studied.

The existence of risk-averse behaviour is often shown in developed markets such as the US, UK, Hong Kong, Japan, France (Nguyen et al. 2020), Canada (Jawadi et al. 2018) and Italy (Jawadi et al. 2018). Nonetheless, findings that explain investors' behaviour in emerging markets are often contradictory. Momin and Masih (2015) showed that investors in emerging markets are less likely to be risk-averse in increasing the appearance of their portfolios in such markets compared to developed countries. Nonetheless, Ali and Asri (2019) argued that investors are risk-averse in prioritising the principal's safety invested in emerging markets. Therefore, there is a need to examine the contradictory evidence of risk-averse behaviour, especially in emerging markets since many studies (see for examples, Debata et al. 2018; Loang & Ahmad 2022; Haroon & Rizvi 2020) have shown that investors behave differently as compared to those in developed ones.

Furthermore, the impact of developed markets on the risk-averse behaviour of investors in emerging markets is often overlooked. Li and Giles (2015) argued that developed markets have a spill over effect on emerging markets due to higher global impact and economic activities. Similarly, Ting et al. (2019) showed that the performance of firms in emerging markets is influenced by developed ones. Therefore, investors are affected by the fluctuation of developed markets. Nonetheless, studies on the impact of developed markets that influence investors to be risk-averse in emerging markets have remained limited.

Additionally, the spill over effect of US bank-specific factors and economic variables should not be ignored as the US has the world's largest stock market, namely the New York Stock Exchange and NASDAQ. The movement of US international financial markets and economic indicators hugely impacts global stock markets (Morais et al. 2019). The empirical evidence of Bräuning & Ivashina (2020) showed that the role of US monetary policy strongly influences investors' behaviours in other financial markets. Investors tend to take the US economic performance as the leading indicator to forecast the performance of listed companies. Therefore, there is a need to examine the impact of US economic and bank-specific factors on risk-averse behaviour in emerging markets.

Risk-averse behaviour is often manifested in financial crises. Abdelhédi-Zouch and Abbes (2012) discovered that to mitigate their risk investors tend to reveal behaviour that is consistent with the Prospect theory in the Subprime Crisis. Yamamura and Tsutsui (2020) also showed that investors tend to be risk-averse to the emergence of COVID-19. This is because the market uncertainty at the beginning stage of financial crises has compelled investors to be conservative in trading. Similar evidence was documented in the studies of Haryanto and Mawardi (2021), Riaz et al. (2020) and Zhang et al. (2021) in which they demonstrated that risk-averse behaviour is the early signal of financial crises, as consistent with the Prospect theory.

The remainder of this paper is organised as follows: Section 2 discusses the previous studies on prospect theory and the determinants of risk-averse behaviour. Section 3 outlines the methodology for estimating economic factors, bank-specific factors and risk-averse behaviour. Section 4 presents the results and discussion. Lastly, Section 5 provides the conclusion, implications, limitations and recommendations for future studies.

LITERATURE REVIEW

PROSPECT THEORY AND RISK-AVERSE BEHAVIOUR

The Prospect theory was developed by Kahneman and Tversky (1992) who maintained that investors are generally risk-averse. They showed that investors behave differently based on the prospect of making a gain or a loss, hence they value gains and losses differently. Given the prospect of making a loss, investors tend to be risk-averse and conservative in trading. The theory explains that investors generally tend to be biased in making investment decisions when under risk. Wang et al. (2021) demonstrated that investors are prone to display the mental presentation effect and strong emotion to loss than gain when evaluating risk thus leading them to become risk-averse, as consistent with the Prospect theory.

Numerous studies have been devoted to examining risk-averse behaviour in developed markets such as the US (Zervoudi 2018), the U.K. (Blake et al. 2021), Hong Kong (Wang et al. 2017), Japan (Wang et al. 2017). These studies showed that investors are generally risk-averse in developed markets. Similarly, Ali and Asri (2019) discovered that investors in emerging markets can also exhibit risk-averse behaviour. Nonetheless, the empirical evidence from Gupta and Pathak (2018) suggested that investors in emerging markets are risk-seeking under market stress in order to remain in their positions in the pecking order. They argued that investors in emerging markets behave differently than those in developed markets. Similar evidence was documented in studies by Remolona et al. (2008), Demirer et al. (2018), Lizarazo (2013), Momin and Masih (2015) and Alquraan et al. (2016) which showed that investors have less tendency to be risk-averse as compared to their counterparts in developed markets. Studies on the risk-averse behaviour of investors in emerging markets, especially under market stress, are rather limited. Investors behave differently between developed and emerging markets (Da Costa Neto et al. 2019; Loang & Ahmad 2023). Furthermore, past studies have often overlooked the impact of developed markets on emerging ones. There is a need to elucidate whether investors in emerging markets are risk-averse, as in developed markets as well as the impact of the developed markets, such as the US, on emerging ones.

Another area of studies examines the factors determining investor risk-taking. Among others, the tendency of risk-aversion can be affected by factors such as gender (see for examples, Byder et al. 2019; Hillesland 2019) and financial literacy (Black et al. 2018). Another potential factor is the market size. Abdullah et al. (2015) claimed that investors exhibit different levels of risk-averse tendency based on differences in market size. They established that investors in bigger markets and with higher expected returns tend to be risk-averse. Sayim and Rahman (2015) also maintained that invertors' risk-averse behaviour can be affected by market volatility, which is often influenced by developed markets. Similar evidence was documented in Acheampong et al. (2014); Vissing-Jørgensen and Attanasio (2003) and Post et al. (2008).

The determinants of risk-averse behaviour are mainly built around the macroeconomic variables (see for examples, Sharif et al. 2015; Dimic et al 2016). González, Nave and Rubio (2018) argued that the macroeconomic variables affect the stock market beta and influence investors to be conservative in trading. Similar evidence was documented by Luchtenberg and Vu (2015) who showed that changes in macroeconomic leading indicators are the signal of financial crises, and most investors will fall into the bias of risk-averse behaviour. Banchit et al. (2020) indicated that changes in macroeconomic variables trigger investors' sentiment due to market uncertainty.

Furthermore, the impact of bank-specific factors on investor risk-taking behaviour is often overlooked in past studies. Silalahi et al. (2021) argued that the changes in bank-specific factors are coincident economic indicators that change simultaneously with the current economic status. Warue (2013) also suggested that bank-specific factors such as non-performing loans affect investors' behaviour since a high volume of non-performing loan is a red flag in the economy. Similar evidence was documented in the study by Aawaar et al. (2020) and Loang et al. (2022) in which they showed that investors' risk-taking behaviour is influenced by bank performance as part of economic performance that causes herding among investors. Moudud-Ul-Huq (2020) also maintained that investors rely upon bank factors to shape their investment patterns. They showed that bank-specific factors are the leading indicators that can be used to forecast the future economy. Nevertheless, studies on the impact of these factors on investors' risk-averse behaviour remained scanty.

In this context, this study aims to examine the impact of economic and bank-specific factors on investors' risk-averse behaviour. The tendency of this behaviour will be compared between four selected emerging markets, such as India, Indonesia, Malaysia and China. Furthermore, this study also aims to examine the impact of the US, as a developed market, on the investors' risk-averse behaviour in emerging markets. Thus, the following hypotheses are proposed:

H_1 Economic factors and bank-specific factors have significant impact on the investors' risk-averse behaviour in emerging markets

$H_{1(a)}$ The tendency of risk-averse behaviour is higher in bigger market capitalisation of emerging markets.

H_2 Economic factors and bank-specific factors of the US as a developed market have significant impact on the investors' risk-averse behaviour in emerging markets

DATA AND METHODOLOGY

DATA AND SAMPLING

Data employed in the study ranged from 1-Jan-2010 to 31-Dec-2021. India, Indonesia, Malaysia and China were selected as the Asian emerging markets due to their large and stable GDP growth rates in the past decade. Singapore was excluded due to its "emerged" status. For sampling, the number of stocks chosen were as follows: India (1375 listed companies), Indonesia (669 listed companies), Malaysia (749 listed companies) and China (Shanghai Stock Exchange - 1262 listed companies). Information on bank-specific factors was sourced from publicly listed banks of India (National Stock Exchange of India Limited - 48 banks), Indonesia (Indonesia Stock Exchange - 47 banks), Malaysia (Bursa Malaysia - 11 banks) and China (Shanghai Stock Exchange - 33 banks). Data on economic factors were sourced from the World Bank, International Monetary Fund (IMF), and Standard and Poor's Capital IQ. All data were collated on a quarterly basis.

ECONOMIC FACTORS

Five types of economic indicators were selected, namely IMF growth forecast (IMF), Gross Domestic Product (GDP) growth rate, real inflation rate (RIR), unemployment rate (UR) and balance of trade (BOT). These economic factors were shown to exert a major impact on the nation and market. The value-added approach was adopted to measure GDP in estimating the overall value of economic output after deducting the cost of intermediary products used in the process, such as raw materials. Table 1 gives the description and related studies of these economic factors.

TABLE 1. Economic factors

Variables	Description	Literature
IMF Growth Forecast	Year-on-year per cent changes in constant price GDP projected by IMF	Sandefur & Subramanian (2020)
GDP Growth Rate	The growth rate of GDP in the value-added approach	Boukhatem & Moussa (2018)
Real Interest Rate	Lending interest rate adjusted for inflation as measured by the GDP deflator	Kiley & Roberts (2017)
Unemployment Rate	The proportion of unemployed labours as per the total labour force	Hwang (2018)
Balance of Trade	Difference between total export and total import	Sodikin & Chaeriah (2018)

BANK-SPECIFIC FACTORS

Five types of bank-specific factors were chosen as the characteristics of banks. Non-performing loans (NPL) to total gross loans, dividend payout (DP), return on equity (ROE), bank capital to assets ratio (CAP) and regulatory capital to risk-weighted assets (CAR) are the indicators that measure the performance and profitability of banks. The description, formula and related studies are summarised in Table 2:

TABLE 2. Bank-specific factors

Variables	Formula	Description	Literature
Non-performing loans to total gross loans	$NPL_{i,t} = \frac{NPL_{i,t}}{TL_{i,t}}$	NPL evaluates the loans which are likely to default and be repaid by borrowers	Ciukaj & Kil (2020)
Dividend Payout	$DP_{i,t} = \frac{DPS_{i,t}}{EPS_{i,t}}$	DP evaluates the dividend paid as the proportion of banks' earnings.	
Return on Equity	$ROE_{i,t} = \frac{I_{i,t}}{E_{i,t}}$	ROE evaluates the efficiency of utilising the shareholders' equity to generate income.	Loang & Ahmad (2022)
Bank Capital To Assets Ratio	$CAP_{i,t} = \frac{BC_{i,t}}{TA_{i,t}}$	CAP evaluates the ability of banks to cover their risk-weighted assets	Abbas, Iqbal & Aziz (2019)
Regulatory Capital To Risk-Weighted Assets	$CAR_{i,t} = \frac{RC_{i,t}}{RWA_{i,t}}$	CAR evaluates the capital adequacy of banks	Hussain, Musa & Omran (2019)

INVESTORS' RISK-AVERSE BEHAVIOUR

The Prospect theory is a behavioural finance theory that posits that investors evaluate gains and losses differently. Investors are shown to be risk-averse and have greater emotions on investment loss. The theory explains why investors tend to deviate from the predictions of securities' returns (Barberis 2018). In this context, risk-averse behaviour is measured by the value function based on the historical returns of stocks, as follows:

$$RB = \sum_{i=-n}^{m} E(r_i) \, . \pi_i \tag{1}$$

Where:

$$E(r_i) = \begin{cases} r_i^c & r_i \geq 0 \\ -\lambda(-r_i)^c & r_i < 0 \end{cases} \tag{2}$$

is the value function for each stock return, and:

$$\pi_i = \begin{cases} f\left(\frac{m-i+1}{30}\right) - f\left(\frac{m-i}{30}\right) & r_i \geq 0 \\ f\left(\frac{i+n+1}{30}\right) - f\left(\frac{i+n}{30}\right) & r_i < 0 \end{cases} \tag{3}$$

with:

$$f(\mathrm{p}) = \frac{p^{\delta}}{\left[p^{\delta}+(1-p)^{\delta}\right]^{1/\delta}} \tag{4}$$

is known as the probability weighting function. In the above equations, RB is the risk-averse behaviour, r is the stock return, λ is the loss aversion, δ is the probability weighting, c is the concave/convex function. λ is greater than 1 when the investors are more sensitive to loss than gain in investment. On the contrary, λ less than 1 shows that investors have a higher weight on gain than loss. There is no evidence of risk-averse behaviour when λ is equal to zero.The probability weighting (δ) is used to examine the behaviour of investors in deciding to choose between an extremely large gain (loss) with a small probability and a certain small gain (loss). This study adopts the estimated parameters with loss aversion parameter (λ) is valued at 2.25, concave/convexity parameter (c) is 0.88 and δ is estimated at 0.61 for gains and 0.69 for losses. This is because these estimated parameters have been proven in the studies of Tversky and Kahneman (1992) and Barberis (2018) to be valid in justifying the risk-averse behaviour of investors.

PANEL DATA REGRESSION

The risk-averse behaviour can be measured in four models; excess return, three-factor alpha, five-factor alpha and six-factor alpha (Dirkx & Peter 2020). The three-factor alpha is adjusted based on the factors of the Fama and French model (Cox & Britten 2019), which are firm size (FS), book-to-market value (BM) and market return (MR). Five-factor alpha is adjusted for Fama and French factors, default rate (DR) and moving average (MA). The six-factor alpha is adjusted for Fama and French factors, DR, MA and stock liquidity (LIQ). Anh & Gan (2020) maintained that panel data regressions with multiple variables should undergo the Hausman test to determine the use of a fixed or random effect model to avoid endogeneity error in the regression. They claimed that multiple variables of panel data regression are reasonable, and the efficiency can be improved through the Hausman test. Therefore, the panel data regressions can be written as follows:

Excess Return

$$RB_{i,t} = \alpha_i + \beta_1 IMF_{m,t} + \beta_2 GDP_{m,t} + \beta_3 RIR_{m,t} + \beta_4 UR_{m,t} + \beta_5 BOT_{m,t} + \beta_6 NPL_{i,t} + \beta_7 DP_{i,t} + \beta_8 ROE_{i,t} + \beta_9 CAP_{i,t} + \beta_{10} CAR_{i,t} + \varepsilon_{i,t} \tag{5}$$

Three-Factor Alpha:

$$RB_{i,t} = \alpha_i + \beta_1 IMF_{m,t} + \beta_2 GDP_{m,t} + \beta_3 RIR_{m,t} + \beta_4 UR_{m,t} + \beta_5 BOT_{m,t} + \beta_6 NPL_{i,t} + \beta_7 DP_{i,t} + \beta_8 ROE_{i,t} + \beta_9 CAP_{i,t} + \beta_{10} CAR_{i,t} + \beta_{11} FS_{i,t} + \beta_{12} BM_{i,t} + \beta_{13} MR_{m,t} + \varepsilon_{i,t} \tag{6}$$

Five-Factor Alpha:

$$RB_{i,t} = \alpha_i + \beta_1 IMF_{m,t} + \beta_2 GDP_{m,t} + \beta_3 RIR_{m,t} + \beta_4 UR_{m,t} + \beta_5 BOT_{m,t} + \beta_6 NPL_{i,t} + \beta_7 DP_{i,t} + \beta_8 ROE_{i,t} + \beta_9 CAP_{i,t} + \beta_{10} CAR_{i,t} + \beta_{11} FS_{i,t} + \beta_{12} BM_{i,t} + \beta_{13} MR_{m,t} + \beta_{14} DR_{m,t} + \beta_{15} MA_{i,t} + \varepsilon_{i,t} \tag{7}$$

Six-Factor Alpha:

$$RB_{i,t} = \alpha_i + \beta_1 IMF_{m,t} + \beta_2 GDP_{m,t} + \beta_3 RIR_{m,t} + \beta_4 UR_{m,t} + \beta_5 BOT_{m,t} + \beta_6 NPL_{i,t} + \beta_7 DP_{i,t} + \beta_8 ROE_{i,t} + \beta_9 CAP_{i,t} + \beta_{10} CAR_{i,t} + \beta_{11} FS_{i,t} + \beta_{12} BM_{i,t} + \beta_{13} MR_{m,t} + \beta_{14} DR_{m,t} + \beta_{15} MA_{i,t} + \beta_{16} LIQ_{i,t} + \varepsilon_{i,t} \tag{8}$$

Where, RB is the risk-averse behaviour, $IMF_{m,t}$ is the IMF GDP forecast of market *m* at period *t*, $GDP_{m,t}$ is the GDP growth of market *m* at period *t,* $RIR_{m,t}$ is the real interest rate of market *m* at period *t,* $BOT_{m,t}$ is the balance of trade of market *m* at period *t*, $NPL_{i,t}$ is the non-performing loan of bank *i* at period *t*, $DP_{i,t}$ is the dividend payout of bank *i* at period *t*, $ROE_{i,t}$ is the return on equity of bank *i* at period *t*, $CAP_{i,t}$ is the bank capital to assets ratio of bank *i* at period *t,* $CAR_{i,t}$ is the regulatory capital to risk-weighted assets, $FS_{i,t}$ is the firm size of bank *i* at period *t,* $BM_{i,t}$ is the book-to-market value. $MR_{m,t}$ is the market return of market *m* at period *t*, $DR_{m,t}$ is the loan default rate of market *m* at period *t*, $MA_{i,t}$ is the moving average of bank *i* at period *t* and $LIQ_{i,t}$ is the liquidity of bank *i* at period *t*.

QUANTILE REGRESSION

The risk-averse behaviour can also be examined in quantile regression. Quantile regression is a technique that may be used in conjunction with traditional analysis when the data do not fulfil the assumption of error normality necessary for ordinary least square regression (Kannadhasan & Das 2020). The primary advantage of the quantile regression method is that it enables the analysis of correlations between variables of the mean data (Loang 2022). The difference between quantile and panel data regression is the examination in τth quantiles. One advantage of quantile regression is the opportunity to examine extreme quantiles, which may represent market stress. Thus, quantile regression provides a more holistic result on risk-averse behaviour compared to panel data regression. The quantile panel data regression is written as:

$$Q_\tau(\tau|V_\tau) = \beta_{0,\tau} + \beta_{1,\tau}.Economic\ Factors_{m,t} + \beta_{2,\tau}.Bank - \text{Specific Factors}_{m,t} + \beta_{3,\tau}.Apha\ Factors_{i,t} + \varepsilon_{t.\tau} \quad (9)$$

RESULTS AND DISCUSSION

DESCRIPTIVE STATISTICS, PEARSON CORRELATION ANALYSIS AND VIF

Table 3 summarises the descriptive statistics of all variables. For economic factors, the mean value of GDP is 0.05, which indicates that the selected countries have an average of 5.3 per cent of GDP improvement from 2010 to 2021. The maximum value of GDP is 0.106, which is the highest GDP annual growth rate in China in 2010. Surprisingly, India has the highest NPLs to total gross loans, with a NPL maximum value of 0.098 in 2017.

TABLE 3. Descriptive statistics of all variables

	Economic Factors					Bank-Specific Factors				
	IMF	GDP	RIR	UR	BOT	NPL	DP	ROE	CAP	CAR
Mean	0.062	0.053	0.042	0.056	0.244	0.047	0.617	0.165	0.062	0.122
Median	0.046	0.038	0.024	0.046	0.133	0.031	0.593	0.174	0.061	0.124
Std. Dev.	0.024	0.134	0.336	0.245	0.352	0.078	0.124	0.087	0.009	0.013
Minimum	-0.052	-0.065	0.024	0.023	-0.239	0.011	0.437	-0.025	0.046	0.098
Maximum	0.080	0.106	0.083	0.097	1.394	0.098	0.780	0.349	0.081	0.153
Skewness	0.284	0.582	0.802	2.274	-1.384	0.646	0.024	-0.304	0.095	-0.035
Kurtosis	0.073	0.852	1.824	0.872	1.479	0.840	1.687	-0.170	0.894	-0.331

The Pearson Correlation Analysis was conducted to detect the potential existence of multicollinearity, which indicates that two variables are highly correlated. Table 4 outlines the result of the analysis. None of the variables had more than a 0.7 correlation coefficient, indicating that the evidence of multicollinearity was not detected.

TABLE 4. Pearson correlation analysis

	RB	IMF	GDP	RIR	UR	BOT	NPL	DP	ROE	CAP	CAR
RB	1.000										
IMF	0.284*	1.000									
GDP	0.040*	0.133**	1.000								
RIR	0.274	0.382*	0.023	1.000							
UR	0.178**	0.284*	0.024*	0.072	1.000						
BOT	0.256*	0.472	0.132*	0.271	0.076*	1.000					
NPL	0.392	0.385	0.134*	0.113	0.003	0.148	1.000				
DP	0.402*	0.189*	0.024*	0.078*	0.071	0.219	0.013	1.000			
ROE	0.149***	0.092*	0.242	0.004*	0.179	0.107	0.074*	0.013	1.000		
CAP	0.012*	0.014*	0.016	0.013*	0.103	0.024	0.041*	0.042	0.015	1.000	
CAR	0.451	0.163	0.278**	0.081*	0.031	0.004	0.103	0.145	0.063	0.017	1.000

*Note: *, ** and *** represents significant level at 10%, 5% and 1%.*

Another method of measuring multicollinearity is using Variance Inflation Factors (VIF). The results of VIF are as follow: RB (1.383), IMF (2.843), GDP (3.728), RIR (3.682), UR (4.379), BOT (3.842), NPL (2.974), DP (1.314), ROE (4.759), CAP (4.982) and CAR (5.489). As a rule of thumb, VIF values of more than 10 indicate that multicollinearity exists. The results suggest that there is no multicollinearity issue in the variables.

ESTIMATES OF INVESTORS' RISK-AVERSE BEHAVIOUR TO ECONOMY AND BANK-SPECIFIC FACTORS

The main objective of this research is to examine and compare the impact of economic and bank-specific factors on investors' risk-averse behaviours in emerging countries. Panel data regression was employed, and the Hausman test used to determine the selection of either a fixed or a random-effect model. With the p-value of the Hausman tests was less than 0.05, the suitable model should thus be the fixed-effect model. Further, the White test and Pesaran CD test were conducted to examine the potential existence of heteroscedasticity. The p-values of both tests were less than 0.05 thus indicating the presence of heteroscedasticity in the panel data regression.

Table 5 summarises the impact of economic and bank-specific factors on investors' risk-averse behaviour and to illustrate that investors value gains and losses differently. The Prospect theory posits that investors have greater emotion for the loss of investment and tend to be risk-averse. The Hausman test results showed that the fixed effect model should be adopted in the panel data regressions of India, Indonesia – excess return, Indonesia – Three-Factor alpha and China. On the contrary, a random-effect model should be employed in Indonesia, Indonesia – Five-factor alpha and Indonesia – Six-factor alpha regressions. Besides, the result shows that heteroscedasticity exists in the panel data regression of China, but there was no evidence of its presence in India, Indonesia and Malaysia. Hence, panel-corrected standard errors (PCSE) were adopted to rectify heteroscedasticity in the China panel data regression.

TABLE 5. Impact of economic factors and bank-specific factors on risk-averse behaviour

		Economic Factors					Bank-Specific Factors					Specification		
	Model	IMF	GDP	RIR	UR	BOT	NPL	DP	ROE	CAP	CAR	Hausman	White	Pesaran CD
India														
Excess Return	Fixed-Effect	-0.139*	-0.072*	0.049	0.173	-0.061	1.483**	0.072	-0.284	0.072	-0.076*	0.004	0.239	0.783
Three-Factor Alpha	Fixed-Effect	-0.138**	-0.046*	0.273*	0.061*	-0.486	1.492*	0.249	-0.294	0.084*	-0.134	0.002	0.342	0.274
Five-Factor Alpha	Fixed-Effect	-0.219*	-0.084*	0.103*	0.240	0.084	1.985*	0.037	-1.085*	0.092	-0.082	0.004	0.864	0.174
Six-Factor Alpha	Fixed-Effect	-0.248**	-0.252*	0.074*	0.023	0.272	2.492	0.248	-0.952	0.134	-0.139	0.028	0.273	0.371
Indonesia														
Excess Return	Random-Effect	0.074**	-0.134**	0.027	0.138	0.239*	0.983*	-0.092	0.024	0.025	0.023	0.283	0.482	0.184
Three-Factor Alpha	Random-Effect	0.075*	-0.394*	0.081	0.741	0.138	1.092*	-0.024	0.072	-0.135	0.033	0.074	0.273	0.072
Five-Factor Alpha	Random-Effect	0.274*	-0.382*	0.138	0.273	-0.672	1.942**	-0.133	0.094	-0.088	0.193	0.289	0.874	0.582
Six-Factor Alpha	Random-Effect	0.138*	-0.284*	0.374	0.583	-0.742	1.393*	-0.024	0.104	0.093	0.084	0.193	0.682	0.284
Malaysia														
Excess Return	Fixed-Effect	0.074*	-0.248**	0.072*	0.149	-0.862	2.492*	0.092	0.042	-0.015	0.044	0.023	0.374	0.479
Three-Factor Alpha	Fixed-Effect	0.029*	-0.283**	0.129*	0.294	0.542	1.284*	0.102	0.085*	0.084	-0.052	0.048	0.274	0.279
Five-Factor Alpha	Random-Effect	0.302*	-0.139*	0.274*	0.283	0.573	1.352**	0.082	0.089	0.193*	0.079	0.424	0.184	0.753
Six-Factor Alpha	Random-Effect	0.862*	-0.865*	0.393*	0.384	-0.972	1.852***	0.099	0.193	0.194	-0.026*	0.294	0.075	0.485
China – Shanghai Stock Exchange														
Excess Return	Fixed-Effect - PCSE	-1.083	-2.490*	2.379	0.071	-1.382	3.824*	0.156	0.046	0.234	0.053	0.038	0.003	0.024
Three-Factor Alpha	Fixed-Effect - PCSE	-0.837	-1.307**	3.293	1.383	3.924	2.592**	0.146	0.022	0.535	-0.074	0.013	0.013	0.025
Five-Factor Alpha	Fixed-Effect - PCSE	-2.487	-4.085*	3.085	2.498	2.480	4.382**	0.135	0.083	-0.252	0.244	0.039	0.008	0.004
Six-Factor Alpha	Fixed-Effect - PCSE	-4.384	-3.802**	2.489	3.485*	4.597	3.792*	0.092	0.072	-0.340	0.149	0.004	0.039	0.097

*Note: *, ** and *** represents significant level at 10%, 5% and 1%.*

Table 5 shows that the IMF growth forecast and GDP growth rate are significantly correlated to the value of risk-averse behaviour at the significance level of 1%, 5% and 10% in India, Indonesia, Malaysia and China markets. The real interest rate positively and significantly correlates with the Indian and Malaysian markets. A higher real interest rate may also induce investors to accept a higher risk-averse level. Moreover, the GDP growth rate was also negatively correlated with risk-averse behaviour in China. It shows that investors are more likely to experience a higher risk-averse level with a lower GDP growth rate. There was no evidence to indicate the impact of unemployment rate and trade balance on investors' risk-aversion.

For bank-specific factors, NPLs to the total gross loan are the only variable with a significant relationship with investors' risk-averse behaviour in India, Indonesia, Malaysia and China. The other variables, such as dividend payout, return on equity, bank capital to assets ratio and regulatory capital to risk-weighted assets, are not significant. It shows that investors are inclined to be risk-averse with a higher level of NPLs, which is indicative of a poor economy.

This result is consistent with Mairafia et al. (2020) who argued that economic and bank-specific factors can have an impact on investors' risk-averse behaviour. The Prospect theory is validated through the results of this study which showed that the fluctuation in the economy and NPLs can stimulate investors to become more conservative in trading. Investors worry about losing money in their investments, especially under market uncertainty. Furthermore, risk-averse behaviour is also shown in all emerging markets, which is inconsistent with Amstad et al. (2020) who maintained that the behaviour is often found in developed economies. They contended that developed markets have higher efficiency, prompting investors to be risk-averse. One of the possible explanations is that investors in emerging markets have become more sophisticated than before due to the advancements in investment technologies and the availability of public information assisting them in making risk-averse decisions.

ESTIMATES OF INVESTORS' RISK-AVERSE BEHAVIOUR TO ECONOMY AND BANK-SPECIFIC FACTORS UNDER US IMPACT

The second objective of this study is to examine the impact of the US economy and bank-specific factors on investors' risk-averse behaviour. This is because the US is considered the largest and most developed country in the world, and its influence on emerging countries is quite significant. Table 6 outlines the impact of the US economy and bank-specific factors on investors' risk-averse behaviour. The fixed-effect model was used for the excess return and three-factor alpha regression in Indian and Malaysian markets. The other regressions used the random-effect model since the hypothesis of the Hausman test was not rejected. The White test and Pesaran CD test showed that none of the regression had p-values less than 0.05. Hence, heteroscedasticity was not detected due to the influence of the US market.

The result shows that the IMF growth forecast and US GDP growth significantly impact on investors' risk-averse behaviour in India and China. Nonetheless, both factors, including the GDP growth rate, were not significant in Indonesia and Malaysia. Furthermore, NPLs to the total gross loan as one of the variables of US bank-specific factors are also significantly correlated with the risk-averse behaviour in Malaysia and China, but not in India and Indonesia. The other variables such as real interest rate, unemployment rate, the balance of trade, dividend payout, return on equity, bank capital to assets ratio and regulatory capital to risk-weighted assets of the US are not significant to the risk-averse behaviour of emerging countries.

TABLE 6. Impact of economic factors and bank-specific factors on risk-averse behaviour under the US impact

		US Economic Factors					US Bank-Specific Factors					Specification		
		IMF	GDP	RIR	UR	BOT	NPL	DP	ROE	CAP	CAR	Hausman	White	Pesaran CD
India														
Excess Return	Fixed-Effect	0.025*	-0.083***	0.024	0.027*	0.479	1.432***	0.075	-0.062	0.125	0.395	0.029	0.238	0.239
Three-Factor Alpha	Fixed-Effect	0.083*	-0.244*	0.058	0.072	-0.284	1.204*	0.224	-0.174	0.072	0.245*	0.003	0.772	0.733
Five-Factor Alpha	Random-Effect	0.072*	-0.072**	0.078	0.097	-0.489	1.084**	0.184	-0.284	0.284	0.104*	0.284	0.724	0.482
Six-Factor Alpha	Random-Effect	0.024**	-0.190	0.097	0.129	0.582	1.424**	0.294	0.084	0.184	0.420	0.284	0.875	0.397
Indonesia														
Excess Return	Random-Effect	0.025	0.082	0.078	0.082	0.082	1.084	0.084	0.184	0.084	-0.082	0.474	0.349	0.238
Three-Factor Alpha	Random-Effect	0.074	0.085	0.284	-0.179	0.154	0.972	0.185	0.282	0.040	-0.190	0.249	0.472	0.472
Five-Factor Alpha	Random-Effect	0.008	0.193	0.154	0.424	-0.078	1.090	0.284	0.294	0.139	-0.294	0.454	0.649	0.684
Six-Factor Alpha	Random-Effect	0.071	-0.142	0.254	0.574	-0.384	1.139	0.486	0.485	0.284	-0.073	0.582	0.385	0.238
Malaysia														
Excess Return	Fixed-Effect	0.082	0.323	0.283	0.783*	-0.574	1.249	0.172	-0.279	0.082	0.084	0.002	0.485	0.582
Three-Factor Alpha	Fixed-Effect	0.084	0.972	0.973	0.924	-0.572	1.082	0.139	-0.894	0.027	0.194	0.013	0.238	0.385
Five-Factor Alpha	Random-Effect	0.194	0.962	0.972	0.293	-0.742	0.979	0.248	-0.583	0.239	0.080	0.239	0.795	0.324
Six-Factor Alpha	Random-Effect	0.076	0.784	0.882	0.384	0.249	0.989*	0.474	-0.479	0.185	0.185	0.374	0.395	0.248
China – Shanghai Stock Exchange														
Excess Return	Random-Effect	1.824**	-2.482*	3.882	-2.495	4.893	1.985*	0.893	2.593	-0.592	0.279	0.273	0.094	0.583
Three-Factor Alpha	Random-Effect	1.472*	-1.084*	1.408	3.985	0.873	-2.984	0.883	1.824	-0.865	0.495	0.471	0.274	0.757
Five-Factor Alpha	Random-Effect	2.325*	-4.835**	2.084	2.490	-2.499	1.893	0.255	0.582	0.973	1.074	0.578	0.875	0.786
Six-Factor Alpha	Random-Effect	1.398*	-3.975**	2.985	1.394	-1.075	2.274***	0.305	1.499	0.856	0.495	0.495	0.779	0.349

*Note: *, ** and *** represents significant level at 10%, 5% and 1%.*

One of the reasons for this finding is that the market value of India ($3.55 Trillion) and China (Shanghai stock exchange - $8.15 Trillion) stock exchanges are much bigger compared to that of Indonesia ($0.54 Trillion) and Malaysia ($0.41 Trillion). Further, India and China have higher import and export values than the US. Therefore, any US economic and bank-specific changes can influence investors' behaviour in India and China.

This result is consistent with Balcilar et al. (2019), who showed that developed markets have a greater global impact on the growth of emerging markets. This is because developed markets have higher values of economic activities than emerging markets. Nonetheless, the study discovered that the US's global impact is not felt in smaller emerging markets. This finding is not consistent with Paramati et al. (2018). The authors argued that the impact of developed markets is dominant, and may affect the smaller markets. One of the possible reasons is that the economic activities of smaller markets have low level global trading and as such any changes in developed markets are thus not reflected.

QUANTILE REGRESSION OF RISK-AVERSE BEHAVIOUR

Most past studies examined risk-averse behaviour based on the OLS approach. Nevertheless, this study differs from previous studies that assessed investors' risk-averse behaviour in quantile regression. This is because quantile regression focuses on the existence of risk-averse behaviour based on different τth quantiles. With quantile regression, this study can better explore the risk-averse behaviour of investors with and without market stress.

Table 7 summarises the results of risk-averse behaviours in emerging countries. This behaviour is apparent in Indonesia and Malaysia markets with the median quantile (τ=0.5). Nevertheless, it is more pronounced in the upper quantile (τ>0.5) and lower quantile (τ<0.5) in the markets in India and China. This indicates that investors in India and China are more sensitive to abnormal market conditions.

Under market stress, the result shows that investors in emerging countries are most likely to be risk-averse in the upper and lower quantiles. All emerging markets have shown similar evidence under market stress. The result indicates that investors are afraid of the loss of investment in the outliers of the distribution. The result of the risk-averse behaviours is different for the two market conditions. The risk-averse tendency is higher under market stress compared to the market condition without market stress.

TABLE 7. Quantile regression of risk-averse behaviour

Quantile	Without Market Stress				Market Stress			
	India	Indonesia	Malaysia	China	India	Indonesia	Malaysia	China
	Risk-Averse Behaviour							
0.10	0.043	0.309	0.084	0.005	0.392*	0.143**	0.984**	0.048**
0.20	0.053	0.585	0.087	0.133	0.482*	0.874	0.274	0.004
0.30	0.104	0.075	0.149	0.482	0.183	0.573	0.975*	0.098
0.40	0.194	0.103	0.103	0.253	0.482	0.149	0.784	0.244
0.50	0.184	0.395	0.582	0.489	0.529	1.082	0.845	0.395
0.60	0.48	0.502*	0.949***	0.774	0.820	0.982	1.399	0.785
0.70	0.549**	0.584***	0.972*	0.389**	0.924	0.894	0.894	0.876**
0.80	0.774**	0.675*	0.842*	0.485**	0.289**	0.990*	0.885***	0.985*
0.90	0.482*	0.583**	0.484**	0.034**	0.840**	1.085*	0.875**	1.084*

*Note: *, ** and *** represents significant level at 10%, 5% and 1%.*

Figures 1(a) and 1(b) outline the coefficient of risk-averse behaviour based on the quantile regression. Market stress is denominated as "1" when the market return is negative, while without market stress is denominated as "0" when the market return is positive. The following indexes: Malaysia Stock Market (FBM KLCI), Indonesia Stock Market (JCI), India Stock Market (SENSEX) and China Stock Market - Shanghai Stock Exchange Composite Index (SSE), are used to determine the market return. The result shows that investors' risk-averse behaviours tend to be stronger in the upper quantile without market stress. Interestingly, risk-averse behaviours tend to be stronger in the lower and upper quantiles under market stress. It indicates that investors are more panicked and frequently change their investment decisions when the markets have negative returns. Based on Figures 1(a) and 1(b), the coefficient result shows that Malaysian investors tend to have the highest tendency toward risk-averse behaviour, followed by Indonesian investors, who are found to be highly risk-averse under market stress. Then, China investors are ranked as having the second least tendency to risk-averse behaviour. Indian investors have the lowest tendency of risk-averse compared to other emerging markets.

FIGURE 1(A). Risk-averse behaviour without market stress

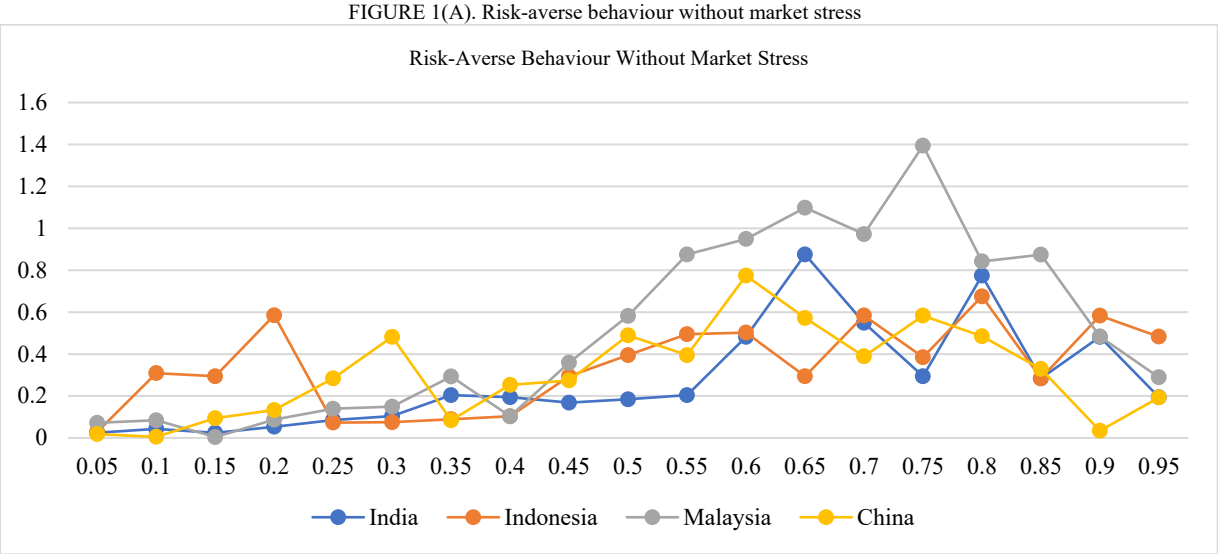
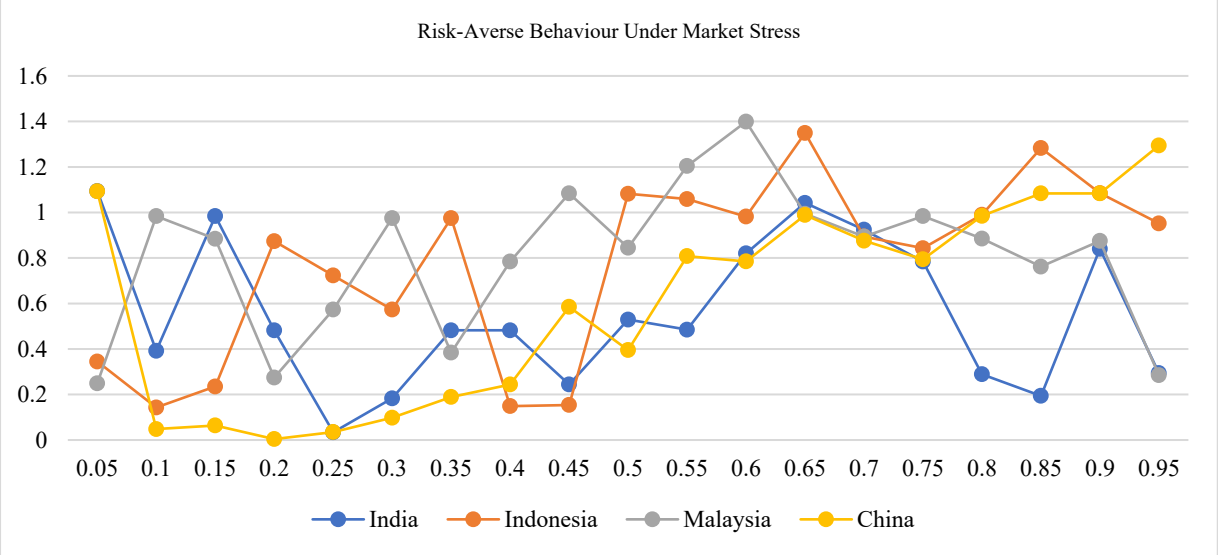


FIGURE 1(B). Risk-averse behaviour under market stress



This result is consistent with Fassas & Papadamou (2018) who suggested that investors are more pronounced to risk-averse in financial crises. This study validates the Prospect theory as investors were found to be risk-averse with or without market stress. The empirical evidence suggests that loss aversion exists among investors, who tend to be more emotional on loss in investment as compared to its gain . Nevertheless, this study showed that investors can also be risk-averse without market stress. The tendency for risk-aversion was observed to differ between markets. One of the possible reasons for this is that investors can generally be risk-averse as they are concerned about securing positive investment returns with higher market volatility. Besides, the advancements in technology and availability of information have also necessitated the investors to receive and process more relevant trading information that drives the investors to be risk-averse.

CONCLUSION

This study examined the impact of economic and bank-specific factors on investors' risk-averse behaviour in emerging countries, namely India, Indonesia, Malaysia, and China. The second objective of this study is to examine the cross-market impact of US economic and bank-specific factors on investors' risk-averse behaviour in these emerging countries. This study also explored the tendency of risk-averse behaviour in different countries. Data from 1-Jan-2010 to 31-Dec-2021 were used, and panel data regression and quantile were adopted. Four different models; namely, excess return, three-factor alpha, five-factor alpha and six-factor alpha, were used for robustness testing.

The results showed that the IMF growth forecast and GDP growth rate were significantly correlated with risk-averse behaviour in India, Indonesia, Malaysia and China markets. The real interest rate was significantly

correlated with risk-averse behaviour in India and Malaysia. The NPLs to the total gross loan showed positive and significant impact on risk-averse behaviour in all emerging countries. Other variables, such as the unemployment rate, the balance of trade, dividend payout, return on equity, bank capital to assets ratio and regulatory capital to risk-weighted assets, were not significant to risk-averse behaviour.

On the impact of the US as a developed market, the results showed that the IMF growth rate, GDP growth rate and NPLs of the country were significant to the risk-averse behaviour in Indian and China markets. There is no evidence to demonstrate the impact of the US market on Indonesia and Malaysia. One of the reasons is that the Indonesian and Malaysian market capitalisation and total trade activities with the US are relatively smaller than those in India and China. The global impact of the US was thus not felt in the smaller emerging markets. The result of the quantile regression shows that Malaysian investors showed the greatest tendency for risk-averse behaviour, followed by Indonesia, China and India. Indian investors showed the lowest tendency compared to the other emerging markets.

IMPLICATION

This study contributes to the literature on Prospect theory, specifically in validating the theory in emerging markets. Most past studies emphasised the risk-averse behaviour in developed markets, while emerging markets were often ignored. This study also went a step further to examine the determinants of risk-averse behaviour in emerging markets. The result is consistent with the argument of Prospect theory in assuming that investors are risk-averse. This is because investors favour gain over loss. The result provides an alternative explanation of the determinants of risk-averse behaviour since economic and bank-specific factors are found to be significant and consistent with the Prospect theory. Furthermore, the study validates the theory of Capital Asset Pricing Model (CAPM), as the CAPM claims that all investors are risk-averse by nature. Due to this behaviour, investors in emerging markets exhibit dissimilar trading activities that differ from those of developed markets. The originality of examining the cross-market impact of developed markets sheds light on investors' risk-averse behaviour and its determinants in emerging markets.

The study contributes to the understanding of the tendency towards risk-averse behaviour which may benefit investors, regulators, policymakers and governments. With the contagion effect of extreme risk-averse behaviour, the respective parties should monitor, control, and regulate this among investors so as to avoid potential financial crises. More pertinent rules and regulations should be established to manage risk-averse behaviour. Intense behaviour can lead to market mispricing and overreaction that distort the efficiency of the market in reflecting accurate information, especially under market stress. The Prospect theory can mislead investors to collectively withdraw their investments during market stress and cause a shock in the economy's circular flow. Moreover, institutional investors should consider the impact of the risk-averse behaviour of individual investors in planning investment strategies. Investors should also be aware of the impact of developed markets in triggering a higher risk-averse tendency under market uncertainty. The markets can otherwise be misshaped by this behaviour that may drive the prices away from fundamentals.

RECOMMENDATIONS FOR FUTURE RESEARCH

One of the limitations of the study is that it does not differentiate between local and foreign investors, thus the tendency of risk-averse behaviour cannot be differentiated between them. Future studies should consider comparing the tendency of risk-averse behaviour between emerging and developed markets. In addition, the impact of the Covid pandemic should also be examined to detect risk-averse behaviour in the market.

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