Stock jump, underperformance and undervaluation: evidence from emerging market

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Abstract: This paper examines the ability of underperforming and undervalued stocks to stimulate stock jumps. Our study also considers firm's systematic risk as an important factor stimulating positive skewness of return which proxied for the stock jump. Using Indonesian data from 2016 until 2018, our findings show that underperforming stocks generally experience a positive stock jump in the subsequent period. Overperforming stocks that are undervalued also produce higher positive skewness of return. Our findings show that undervalued high-risk stocks are likely to trigger a stock jump. These findings have practical implications for both risk-averse and risk-seeking investors.

Keywords: stock jump; underperformance; undervaluation; risk; earnings; behavioural finance.

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1 Introduction

Market efficiency is a theory that has been extensively studied in the capital market and has received much attention from the very beginning. Many studies support it, but many also criticise it. Many have questioned how investors can consistently detect mispriced securities (Rossi, 2015). Behavioural finance (Shiller, 2000) explains how investors experience bias in making investment decisions. This bias could be due to calendar year effects (Rossi, 2015), overconfidence (Daniel and Hirshleifer, 2015; Kourtidis et al., 2015), investor sentiment (Mian and Sankaraguruswamy, 2012; Jokar and Daneshi, 2020; Gakhar and Kundlia, 2021), overreaction (DeBont and Thaler, 1985) and various other biases. This study complements the research in behavioural finance by investigating how investor bias in overreaction combined with anchoring and adjustment affects investors' trading behaviour, leading to stock jumps in the next period.

Overreaction studies show that investors have overly optimistic expectations, which contribute to stock's valuation being systematically overvalued or undervalued (DeBondt and Thaler, 1985; Blackburn and Cakici, 2017; Bordalo et al., 2020). This overreaction stimulates a crowd because investors place too much weight on the good (bad) news in their transactions. The situation illustrates market inefficiency. In the future, stock prices will experience a jump (crash) when investors currently put too much weight on underperforming (overperforming) firms. We believe that underperforming firms contribute to stock jump studies using behavioural finance theory.

Our study proposes the idea that underperforming firms exploit the suboptimal behaviour of investors who fixated their attention on overperforming firms. Noise traders (or crowds) exclude underperforming firms from their portfolios, but when they realise the price is undervalued, underperforming firms produce the stock jump in the subsequent period.

Earnings information is the primary indicator of performance. Barbier and Farfán (2021) state that earnings is essential information because it shows the potential for profit-generating and, therefore, investors consider this information as evidence of value creation. Earnings is superior information in the capital market, and together with complement information, it can influence investor reactions (Francis et al., 2002). Thus, earnings-return relation has become the testing standard for value relevance (Landsman et al., 2012).

Several studies show that managers have various motivations to accelerate (delay) good (bad) news (Hutton et al., 2009; Kothari et al., 2005). When managers report higher

earnings in the current period, the probability of stock jumps decreases in the future (Hutton et al., 2009). A higher (lower) current earnings will increase (decrease) investors' expectations of the company's prospects. This phenomenon refers to anchoring and adjustment (Pompian, 2012). If investors increase their expectations, companies will be increasingly difficult to meet or even beat investors' expectations (Bartov et al., 2002). Considering the bias of market psychology, where the market is more stingy in rewarding than punishing, this condition causes the high reported earnings for the current period to decrease the probability of the stock in experiencing a price jump in the future. Conversely, investors will not set high future expectations for companies that record low earnings or losses. Under this condition, the companies will be more likely to meet or even exceed the investors' expectations in the subsequent period which will be rewarded by a stock jump.

However, the market mechanism of the stock jump will be different if we consider the undervaluation and overvaluation of stock. Conrad et al. (2002) stated that glamour stocks tend to underperform compared to the value stocks in the subsequent period. Glamour stock is a company with a high PBV or can be said to be expensive. For glamour stocks, investors expect that the stocks experience a positive shock in the future. Therefore, if the stocks experience increased performance in the future, the market has anticipated this performance increase, so no price jump is expected. Conversely, companies that reported earnings last year and whose share prices were still low are categorised as value stocks. Value stocks tend to experience a correction in future prices, which increases the probability of a stock jump.

Stock returns will always be compared relative to the accompanying risk. In theory, the higher the risk, the higher the expected return demanded by investors. However, in reality, various empirical studies on risk and return still have mixed results (Baillie and DeGennaro, 1990).

The trade-off between risk and return also affects the probability of a stock jump. Stocks with higher risk are not attractive for risk-averse investors; therefore, stocks with high beta cause the demand for these stocks to decrease, which lowers future returns. Therefore, stocks with high risk reduce their chances of experiencing a stock jump in the future.

The above conditions do not apply if the stocks are included in the value stock category. If the stocks are classified as value stocks, investors will still consider investing in stocks with higher risk because the stock price is still low (undervalue). Therefore, for companies with low PBV, the risk-return trade-off will apply, meaning that the higher the risk of a stock, the more likely it will jump in the coming period.

The capital market plays a fundamental role in economic growth and development. It acts as one of the leading economic indicators. Stock prices also provide valuable information and confidence in the capital market (Tlemsani, 2020). Well-informed investors have a greater probability of making good decisions encouraging economic growth (Khalid et al., 2021). Therefore, various studies were conducted to get a more complete picture of the capital market and the behaviour of market participants.

Research on stock jump on emerging capital markets is still lacking, and Indonesia is considered a part of the most promising emerging capital markets (Danis et al., 2015). Thus, we employ the Indonesian Stock Exchange (IDX) as the representative sample of emerging capital markets characterised as a mostly positively skewed market.

This study examines the determinants of stock jumps in a developing capital market that is positively skewed. Developing markets respond to issues differently than developed markets (Harjoto et al., 2020). Wen and Yang (2009) find that stock returns in emerging markets are dominated by a positively skewed distribution of returns due to high turnover rates and more speculative trading. Prior studies focus on stocks or markets that are negatively skewed, which is related to the risk of stock crashes for investors (Kim and Zhang, 2016; DeFond et al., 2015; Andreou et al., 2016; Aziz and Ansari, 2018). A prior study examining the stock return movement of the IDX market is also focused on the stock price crash (Purwoto and Tandelilin, 2014). The findings of our study will be relevant for investors in developing capital markets who want to better understand and identify stocks with the potential of experiencing stock jump.

This research contributes to behavioural finance research. Contrary to the efficient market theory, we believe that investors are not always rational in allocating their portfolio and evaluating firm's performance, especially when they receive new information and process the numbers to their decision. Investors tend to experience overreaction to the earnings information they received in the past, reflected in stock returns. Overreaction is an essential cognitive bias to be discussed in the stock market that stimulates stock jump.

We present this paper by the following structure: Section 1 presents the background and motivation of this study. Next part discusses the literature review and hypothesis development. Section 3 describes the data and methodology. Section 4 presents the empirical results and analysis. Finally, Section 5 contains conclusions, limitations, and opportunities for further research.

2 Literature review

Investors react to earnings information (Abdolahi et al., 2020; Barth et al., 2021). The investor's reaction can be inferred from the movement of stock prices. The empirical research conducted by Hutton et al. (2009) examined the stock jump phenomenon and find that companies that posted earnings in the past period did not experience stock jumps in subsequent periods. Anchoring bias occurs when a person takes a certain value as an anchor to form his or her expectations in the future (Pompian, 2012). Investors will take current period earnings as an anchor and adjust the value of these earnings to form their expectations for the future.

Investors can build trading strategies based on past stock price trends, either using a momentum strategy or a contrarian strategy (Chancharat and Sinlapates, 2021). In momentum strategy, winner stocks are expected to produce higher return in the next period (Jegadeesh and Titman, 1993). As a result, the company's higher expected earnings will be harder to be achieved in the next period. In turn, this makes it difficult for the company's stock to experience stock jumps in subsequent periods as they cannot beat the investor's expectations (Bartov et al., 2002). The phenomenon of return reversal of winner stocks can also be attributed to the temporary shift of equilibrium price from investors who prefer to buy stocks with a history of high returns (Jegadeesh and Titman, 1993).

The resistance of high performing stocks against stock jump could also be explained by continuous disclosure of good news. Hutton et al. (2009) argue that companies experiencing good news have no incentive to keep the good news. Good performance

will encourage continuous information disclosure so that stock prices and returns are more stable over time. This condition causes companies with good news to have less chance of experiencing stock jumps in the next period.

Conrad et al. (2002) argue that good news is expected to be persistent in the future. Investors will expect the good news to be persistent in the next period if the previous period's earnings are considered good news. As a result, if the good news actually occurs in the future, the past stock prices have absorbed the information, and future prices could not reflect the new information. In turn, overperforming stocks are less likely to cause stock jumps in the subsequent period since the investors have already anticipated the subsequent good news in the stock price t–1. The opposite is true for companies that reported low earnings or even losses in the past period.

Conversely, for companies with low earnings or even losses in the current period, investors will not make expectations too high for the company's performance in the future. This condition makes it easier for companies to meet or even exceed investor's expectations so that these stocks tend to experience stock jumps in the next period.

H1a: Firms with low earnings in the current period stimulate a stock jump in the subsequent period.

We also examine whether stocks valuation affects stock's propensity to experience stock jump. Conrad et al. (2002) categorised stocks based on their valuation into glamour and value stocks. Glamour stocks are characterised by high PBV and tend to be overvalued compared to value stocks. Thus, the anchoring and adjustment theory (Pompian, 2012) predicts that the high expectation of glamour stocks will negatively associate with the stock jump. On the other hand, value stocks are stocks whose prices are considered to be undervalued and have low PBV. Price of value stocks are expected to increase in the next period, which has a greater chance of experiencing a jump. We argue that over or undervaluation of stocks moderates earnings and stock jumps relation.

H1b: Undervalued stocks moderate the negative relationship between earnings and stock jump.

We consider the effect of risk on the stock jump. In general, stocks with high risk are expected to have high expected returns. Theodossiou and Savva (2016) and Savva and Theodossiou (2018) find that risk and return relation is still inconclusive and is affected by skewness and kurtosis of the stock return.

If a company discloses news, investors will revise their expected return on the stock and decide whether to buy/sell/hold stocks (Pompian, 2012). From an investor's perspective, their utility will increase as the expected value increases and/or the risk in their investment portfolio decreases.

So, if the stock has a high beta or risk, adding the stock to the portfolio will increase the risk of his or her portfolio investment. Consequently, the higher the stock risk, the more investors will avoid the stock. If many risk-averse investors behave in this way, the higher the risk of the company's stock, the lower the demand of the stock. This condition, in turn, will reduce stock return (Scott, 2015) and also its probability to jump.

H2a: High-risk stocks prevent a stock jump in the subsequent period

Investors' differences in expectation on company's future performance generate the concept of glamour (value) stock to represent the overvalued (undervalued) stocks

(Conrad et al., 2002; DeBondt and Thaler, 1985; Blackburn and Cakici, 2017; Bordalo et al., 2020).

The risk-return trade-off is applied if the stock is categorised as undervalued. High-risk stocks have high price fluctuations as well. A discerning investor takes advantage of the timing to buy this high-risk stock when the price is low (undervalued) because this type of stock has a high probability to experiences a significant price reversal in the next period since it has a high fluctuating stock price pattern. So, when a slight positive surprise occurs, the probability of a stock jump will be higher.

On the other hand, the high-fluctuating stock will be very risky to fall when the price is overvalued because when there is a slight negative surprise, the price will fall and risk crashing.

H2b: Undervalued stocks moderate the relation between firm's risk and stock jump.

3 Data and method

We employ the stock market returns from the Indonesian Stock Exchange (IDX) as the sample of this study. The reasons are

1 BEI is an inefficient capital market even in weak form so that technical analysis becomes dominant (Andrianto and Mirza, 2016; Ginting et al., 2021; Hartono and Sulistiawan, 2014; McKenzie, 2007; Yang and Pangastuti, 2016)

2 low level of earnings informativeness (Landsman et al., 2012) so that stock prices may not reflect performance.

The sample used in this study is publicly traded companies in the IDX from 2016 to 2018, excluding the financial sector. All shares are actively traded throughout the year, at least traded for 90% of the maximum trading days during the year. Stock valuation in this research is proxied by positive skewness of stock return in the subsequent period. Positive skewness means that positive returns dominate the distribution of stock returns. Skewness is calculated from the company's weekly standard error return regressed with weekly market returns and weekly industrial returns for one year (Hutton *et al*., 2009; Kim and Zhang, 2016). Standard errors are obtained from the following regression equations:

$$r_{j,w} = \beta_0 + \beta_{1,j} r_{m,w-1} + \beta_2 r_{s,w-1} + \beta_{3,j} r_{m,w} + \beta_{4,j} r_{s,w} + \beta_{5,j} r_{m,w+1} + \beta_{6,j} r_{s,w+1} + \varepsilon_{j,w} \quad (1)$$

The symbol of $r_{j,\ w}$ is the weekly return of the firm j in week w. The weekly market (industrial) return is represented by r_m (r_s). Leads and lags on market return and industrial return capture the factor of non-synchronous trading.

Referring to Hutton et al. (2009), $\varepsilon_{j,w}$ is highly skewed. Next, we transform the residual ($\varepsilon_{j,w}$) of the regression to $W_{j,w} = \ln(1+\varepsilon_{j,w})$ so that the distribution becomes roughly symmetrical (normally distributed). $W_{j,w}$ represents the company's specific weekly return. Skewness is calculated from the specific weekly return of each company for each year. This transformation can specify crashes and positive jumps symmetrically because the residual return corresponds to a threshold number of standard deviations either above or below the average (Hutton et al., 2009). Furthermore, this study only selects objects with positive skewness values (POS_SKEW), reflecting the company

experiencing extreme positive returns. Previous studies use negative skewness to proxy stock crashes (Kim and Zhang, 2016; DeFond et al., 2015; Andreou et al., 2016). Our research fills the gap by using positive skewness as a proxy for the stock jump.

Earnings represent information on companies' profitability and performance, influencing investors' reactions in the capital market (Francis et al., 2002). Thus, earnings-return relation has become the testing standard for value relevance measurement (Landsman et al., 2012). Earnings per share (EPS) is an important variable used to explain the role of current performance in a highly positive future return. BETA is used to represent a risk in this study. Beta is calculated based on the market model for each firm for each year. Higher Beta indicates a higher risk of the stock relative to the market. We use price to book value (PBV) to represent relative valuation for stocks. We believe that undervalued stock produces positive skewness of return. Therefore, controlling PBV is an essential feature of our study. This study uses SIZE, CFO, and DAR as controlling variables. Size is measured as a natural logarithm of beginning total assets, while CFO is measured as cash flow from operation divided by the total asset. DAR represents the proportion of total debt to total assets. Regression to test hypotheses is:

$$\begin{aligned} POS\_SKEW_{j,t} = {} & \alpha_{j,t} + \beta_1 EPS_{j,t-1} + \beta_2 BETA_{j,t-1} + \beta_3 SIZE_{j,t-1} + \beta_4 PBV_{j,t-1} \\ & + \beta_5 CFO_{j,t-1} + \beta_6 DAR_{j,t-1} + \varepsilon_{j,t} \end{aligned} \tag{2}$$

H1a (H2a) is supported if β_1 (β_2) < 0.

To test H1b and H2b, we use PBV as a moderating variable:

$$\begin{aligned} POS\_SKEW_{j,t} = {} & \alpha_{j,t} + \beta_1 EPS_{j,t-1} + \beta_2 BETA_{j,t-1} + \beta_3 PBV_{j,t-1} + \beta_4 EPS_{j,t-1} * LOWPBV_{j,t-1} \\ & + \beta_5 BETA_{j,t-1} * LOWPBV_{j,t-1} + \beta_6 SIZE_{j,t-1} + \beta_7 CFO_{j,t-1} \\ & + \beta_8 DAR_{j,t-1} + \beta_9 EPS_{j,t} + \varepsilon_{j,t} \end{aligned} \tag{3}$$

LOWPBV is a dummy variable. We value one (1) for lower PBV and zero (0) otherwise. Higher and lower PBV are determined by the median PBV.

H1b (H2b) is supported if $\beta_4 (\beta_5) > 0$.

4 Empirical results and analysis

Table 1 exhibits the process of sample selection. We exclude firms in the financial sector and firms whose shares are traded less than 90% of the maximum trading days during the year, so we begin with 930 firm-years observations. Next, we exclude firm-years with missing empirical data (23 firm-years) and firm-years having negative skewness (293 firm-years), leaving us with 617 firm-years observation. Following previous studies (Khan and Watts, 2009; Kim and Zhang, 2016), we exclude firm-years with extreme values of each variable to anticipate extreme values influencing the results obtained. The firm-years are excluded if the data is above (below) the mean plus (minus) three times the standard deviation of each variable (42 firm-years). We are left with a final sample of 575 firm-years. This dataset consists of an unbalanced sample of 332 firms over the period 2016–2018.

Table 1 Sample selection

Description	*Number of firm-years*
Firms listed in the Indonesian Stock Exchange (IDX) from 2016 to 2018	930
Minus: Firms with missing empirical data	(23)
Firms with negative skewness	(293)
Firms with positive skewness of return	617
Minus: Firms with extreme value	(42)
Number of observations (firm-years)	**575**

Table 2 provides descriptive statistics of variables used in the empirical models. The data covers 575 firm-years in the sample period 2016–2018. The dependent variables (*POS_SKEW*) is presented in current-year values. The variables of interest (EPS and BETA) and control variables are presented in lag-one-year values, except for EPS for the current period.

Table 2 Descriptive statistics

	N	*Minimum*	*Maximum*	*Mean*	*Std. deviation*
$POS\_SKEW_{j,t}$	575	0.000	3.100	0.873	0.680
$EPS_{j,t-1}$	575	–549.600	1942.800	75.593	211.254
$BETA_{j,t-1}$	575	–6.545	2.232	0.513	0.668
$SIZE_{j,t-1}$	575	24.100	34.200	29.011	1.724
$PBV_{j,t-1}$	575	0.000	64.400	2.307	5.009
$CFO_{j,t-1}$	575	–2.900	8.000	0.169	0.823
$DAR_{j,t-1}$	575	0.000	2.100	0.504	0.256
$EPS_{j,t}$	575	–2261.300	3190.690	80.861	267.216

The correlation of all variables is depicted in Table 3. Table 3 exhibits that $POS\_SKEW_{j,t}$ is negatively correlated with $EPS_{j,t-1}$ and $BETA_{j,t-1}$. This condition shows that if the EPS and BETA of the *t*–1 period are low, then POS_SKEW is high for the subsequent period. $PBV_{j,t-1}$ has no significant correlation with $POS\_SKEW_{j,t}$. $DAR_{j,t-1}$ has a positive correlation with $POS\_SKEW_{j,t}$ so that the higher the DAR in the *t*–1 period, the higher the POS_SKEW in the subsequent period.

Table 4 shows that firms with lower EPS stimulate positive skewness in the following period. Model 1 (without EPS_t) and model 2 (with EPS_t) produce the same conclusions. These results support H1a that underperforming stocks will experience a positive stock jump in the subsequent period. This finding suggests that for companies that underperformed in this period, investors' expectations for future performance will be lower, which will be more likely to induce stock jumps in the following period. This result also supports the existence of investor bias due to anchoring and adjustment (Pompian, 2012). Investors overreact to the information and stimulate undervaluation in

the current year and stock jump when receiving bad news. The results of this test do not change even though we include EPS_t in Model 2. So, indeed the current investor reaction will trigger a stock jump in the future. This condition refers to an inefficient market condition. Additionally, this result implies that companies with good news have no incentive to keep that information, supporting Hutton et al.'s (2009) findings. As good news information will be immediately reflected in current earnings, it will be less likely for the companies to experience stock jumps in the next period.

Table 3 Pearson correlations

Correlation Coefficient (sig.)	POS_SKEW_t	EPS_{t-1}	$BETA_{t-1}$	$SIZE_{t-1}$	PBV_{t-1}	CFO_{t-1}	DAR_{t-1}	EPS_t
POS_SKEW_t	1							
EPS_{t-1}	–0.125***	1						
$BETA_{t-1}$	–0.0090**	0.102**	1					
$SIZE_{t-1}$	–0.074	0.221***	0.205***	1				
PBV_{t-1}	–0.032	0.045	–0.068	–0.058	1			
CFO_{t-1}	–0.058	0.082	0.019	–0.151***	0.015	1		
DAR_{t-1}	0.118***	–0.059	0.050	0.249***	0.007	–0.029	1	
EPS_t	–0.049	0.480***	0.109***	0.178***	0.040	0.058	–0.009	1

*, **, ***represents statistical significance at the 0.1; 0.05 and 0.01 level (2-tailed), respectively.

Table 5 present the effect of EPS on the stock jump changes after considering PBV as a moderating variable. Overall, in Model 3, 4, and 5 appears that lower EPS stimulates stock jump. Conversely, the higher the previous EPS, the higher the current stock jump for undervalued firms (having low PBV) in the previous period (See Model 3 and Model 5 in Table 5). These results present evidence that undervalued stocks affect the relation between underperformance firms and stock market jump. H1b is supported.

The findings in Table 5 show that overvalued and undervalued stocks affect investors' perceptions and stock returns in the next period. Considering the PBV, undervalued stocks in the previous period would tend to experience a stock jump in the next period. Overperforming firms also produce a stock jump when the stocks are undervalued.

After presenting the evidence of H1a and H1b, H2a and H2b should also be examined. Table 4 presents that the systematic risk represented by BETA hinder the positive skewness of return in the future. Higher BETA reduces the potency of a stock jump. These results support H2a.

Table 5 Models 4 and 5 show that PBV also moderates the effect of BETA on stock jumps. The risks (proxied by BETA) positively affect stock jumps in the next period, which is in line with the risk and return trade-off theory. However, these results only apply to stocks that are considered undervalued in the $_{t-1}$ period. H2b is supported.

Table 4 Regression EPS, BETA and positive skewness

Variables	*Model 1*		*Model 2*	
	Coef.	*t-value*	*Coef.*	*t-value*
(Constant)	1.739	**3.466*****	1.761	**3.497*****
		(0.001)		(0.001)
EPS_{t-1}	0.000	**–1.976****	0.000	**–2.025****
		(0.049)		(0.043)
$BETA_{t-1}$	–0.074	**–1.717****	–0.075	**–1.745****
		(0.086)		(0.082)
$SIZE_{t-1}$	–0.033	**–1.877****	–0.034	**–1.915****
		(0.061)		(0.056)
PBV_{t-1}	–0.005	–0.925	–0.005	–0.942
		(0.355)		(0.347)
CFO_{t-1}	–0.048	**–1.391***	–0.049	**–1.409***
		(0.165)		(0.159)
DAR_{t-1}	0.362	**3.183*****	0.362	**3.182*****
		(0.002)		(0.002)
EPS_t			<0.00	0.578
				0.564
F–test		**4.353*****		**3.775*****
		(<0.010)		(<0.010)
Adj R^2		0.034		0.033
N		575		575

*, **, *** represents statistical significance at the 0.1; 0.05 and 0.01 level (1-tailed), respectively.

To support the findings, we also carry out an independent sample t-test of positive skewness between firms that experienced losses and firms that experienced profits in period *t*–1. The results are demonstrated in Table 6.

Panel A in Table 6 demonstrates a significant difference in positive skewness between profitable and loss-making firms in period *t*–1. It appears that stocks that experienced losses (profit) in the past period had a higher (lower) average positive skewness of return. This finding confirms the regression test results in Tables 4 and 5 (Model 1, 2, 3, 4 and 5). This evidence also indicates that investors are irrational. Investors tend to overreact to bad news in this period and adjust in the next period so that the return in the next period have the opportunity to jump.

Table 6 Panel B exhibits our findings for independent sample *t*-tests between the positive skewness of stocks with high beta and low beta. The table shows that the positive skewness of return with low (high) BETA has a higher (lower) average value. The evidence of Panel B confirms the findings in Table 4 (Models 1 and 2), that the higher (lower) the BETA, the lower (higher) the positive skewness of return in the future.

Table 5 Regression with PBV as moderating variable

Variables	*Model 3*		*Model 4*		*Model 5*	
	Coef.	*t-value*	*Coef.*	*t-value*	*Coef.*	*t-value*
(Constant)	1.730	**3.452*** **	1.786	**3.553*** **	1.752	**3.498*** **
		(0.001)		(<0.010)		(0.001)
EPS_{t-1}	0.000	**–2.906*** **	0.000	**–1.735** *	0.000	**–2.551*** **
		(0.004)		(0.083)		(0.011)
$BETA_{t-1}$	–0.065	**–1.523***	–0.112	**–2.359*** **	–0.094	**–1.978** *
		(0.128)		(0.019)		(0.048)
PBV_{t-1}	–0.004	–0.690	–0.004	–0.646	–0.003	–0.489
		(0.491)		(0.518)		(0.625)
EPS_{t-1}* LOWPBV	0.001	**2.578*** **			0.001	**2.281** *
		(0.010)				(0.023)
$BETA_{t-1}$* LOWPBV			0.133	**1.829** *	0.102	**1.385***
				(0.068)		(0.167)
$SIZE_{t-1}$	–0.033	**–1.871** *	–0.036	**–1.994** *	–0.034	**–1.935** *
		(0.062)		(0.047)		(0.053)
CFO_{t-1}	–0.043	–1.248	–0.048	**–1.401***	–0.043	–1.257
		(0.213)		(0.162)		(0.209)
DAR_{t-1}	0.355	**3.137*** **	0.360	**3.176*** **	0.354	**3.136*** **
		(0.002)		(0.002)		(0.002)
EPS_t	<0.001	0.330	<0.001	0.520	<0.001	0.310
		(0.742)		(0.603)		(0.757)
F-test	**4.166*** **		**3.735*** **		**3.923*** **	
	(<0.010)		(<0.010)		(<0.010)	
Adj R^2	0.042		0.037		0.044	
N	575		575		575	

LOWPBV is a dummy variable: one (1) if PBV is lower than median PBV and zero (0) if otherwise.

*, **, *** represents statistical significance at the 0.1; 0.05 and 0.01 level (1-tailed), respectively.

An interesting result is found when we consider overvalued and undervalued stocks. Overvalued stock is characterised by a high PBV, whereas a low PBV represents an undervalued stock. Considering PBV can moderate the effect of EPS and BETA on stock jumps.

We also performed a univariate test to investigate this phenomenon, which is depicted in Table 7.

Table 6 Independent sample t-test for positive skewness

Panel A: Profit and loss firms					
		N	*Mean*	*Std. deviation*	*Std. error mean*
POS_SKEW	Profit firms	461	0.837	0.656	0.031
	Loss firms	114	1.016	0.755	0.071
	t-test		–2.525**		
Panel B: High risk and low-risk stocks					
POS_SKEW	HIGH_BETA	123	0.723	0.583	0.053
	LOW_BETA	452	0.913	0.699	0.033
	t-test		–2.772***		

Profit firms = EPS*t*–1>0; Loss firms = EPS*t*–1 < 0. HIGH_BETA = ABSBETA > 1; LOW_BETA = ABSBETA < 1. *, **, *** represents statistical significance at the 0.1; 0.05 and 0.01 level (1-tailed), respectively.

Table 7 Independent t-test for positive skewness on high PBV (Overvalued) stock and low PBV (Undervalued) stocks

		N	*Mean*	*Std. deviation*	*Std. error mean*
POS_SKEW	LOW_PBV	283	**0.980**	0.698	0.042
	HIGH_PBV	292	**0.768**	0.646	0.038
	t-test		3.783***		

*, **, *** represents statistical significance at the 0.1; 0.05 and 0.01 level (1-tailed), respectively.

Table 7 presents stocks that are considered undervalued in the previous period. The positive skewness is significantly higher than stocks that were overvalued (expensive) in the previous period. Using the idea of a weak form of efficiency, investors can benefit from using the historical data of PBV to earn an extra return.

5 Conclusion

This study empirically investigates the effect of underperforming stocks on stock jumps from the perspective of companies' earnings and stocks valuation (H1a and H1b, respectively) and risk (H2a and H2b). The results from testing hypothesis 1a show that underperforming companies (low earnings stocks) in the current period experience a stock jump in the subsequent period. We also consider the effect of stock valuations on stock jumps in hypothesis 1b. Stocks with high current performance that are undervalued are more attractive to investors. The combination of good performance and low price allows stocks to experience a price increase in the next period, which will increase the potential for a price jump.

We complement this study by investigating the effect of risk on stock jumps in hypotheses 2a and 2b. Empirical results show that higher risk stocks are less likely to experience stock jumps in the next period (H2a). Further investigations show that high-

risk stocks that are undervalued makes the stocks to have a higher potential for a stock jump in the next period (H2b).

Our study shows that investors experienced bias in investing decisions because of bounded rationality, supporting the behavioural finance theory. Traders can exploit the overreaction decision bias by investing in undervalued stock. Trading strategy based on undervaluation is also useful when investors select higher risk stocks. When the riskier stocks are complemented with undervaluation information, the stock is considered at the 'bottom' level that has a higher probability of jump in the subsequent period when the price reversal occurs.

Our study is important for investment managers in selecting a portfolio; they can pick stocks with higher systematic risk when the stocks are undervalued. The study also contributes to behavioural finance, especially on stock jump literature. Our paper provides evidence that undervalued stocks is one of the important determinant variables for future stock jump.

This research has several limitations. First, this study employs sample from a single emerging stock market, which will limit the generalisability of this paper's findings. Second, this paper measures underperforming stock using one lag period. Future research should consider whether under (over) performance in multiple periods can explain the stock jump.

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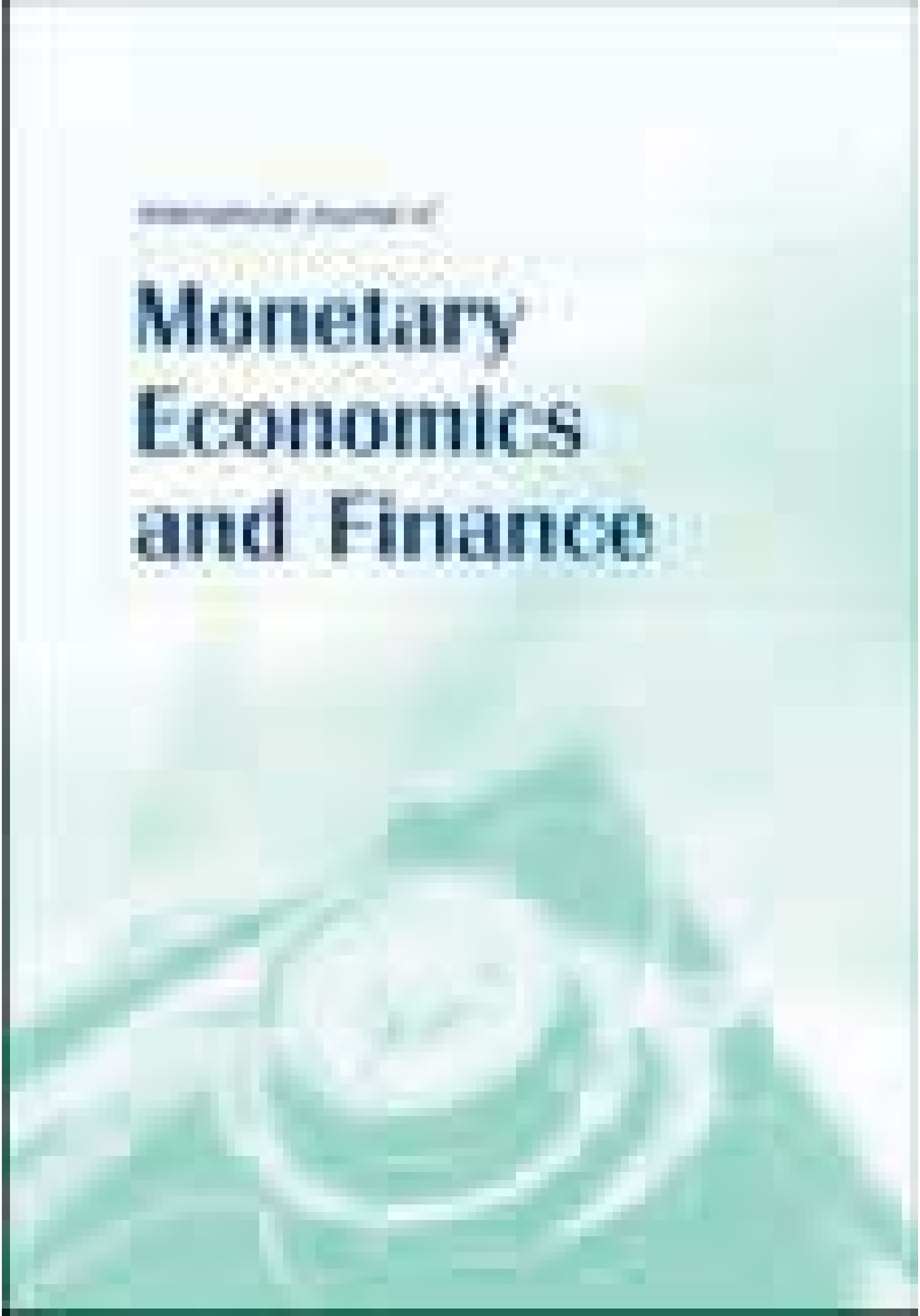
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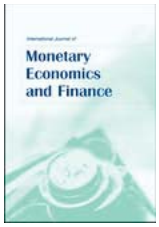

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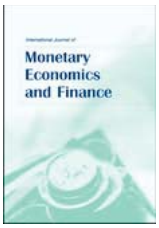

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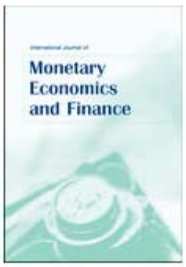

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