

Disposition Bias Investor Decisions, Accounting Measures, Stock Price, and Certain Market Indicators in the Financial Crisis Period: The Fact from Indonesian Stock Exchange 2008-2009

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Abstract: This study investigates how investor's behavior i.e. disposition effect affect stock price in Indonesian Stock Exchange in the period of financial crisis (2008 – 2009). This study also investigates how are accounting measures (earning per share and book value per share) and certain market indicators (stock trading volume and stock price volatility) in the relationship of disposition effect and stock price. Multiple linear regression analyses perform to analyze of the population of 398 firms listed in the IDX in the year 2009, from where a sample of 53 firms was selected based on an inclusion criterion. This study uses daily investors transaction data of the period January-June 2008 (before financial crisis), July-December 2008 (during financial crisis), and January-June 2009 (after financial crisis). This study indicated that disposition bias by investors affect negatively stock price and weaken the positive relationship between EPS and SP during and after financial crisis period, but weaken the positive relationship between BVS and SP before financial crisis period. The other results show that VOL elicit negative effects on SP in the period before the financial crisis, but VOT has a negative effect on SP for the period during and after a financial crisis. Stock market practitioners and researchers should consider disposition bias by investors in the stock market to make better analyses of stock price, accounting measures, and certain market indicators. This study provide evidence that behavioral bias i.e. disposition effect by investors in decision making occurred in Indonesian Stock Exchange and affect negatively stock price and weakens the relationship between information of firm fundamental value and stock price during period of normal and financial crisis.

Keywords: Disposition effect; Stock prices; Accounting measures; Stock market variables; Financial crises; Indonesian Stock Exchange.

JEL Classification: G01, G11, G41

1. Introduction

In the past 3 decades, there has been a significantly high rate of economic growth in emerging economies (Armansyah, 2018). The persistence of economic growth in these countries has in part been linked to trade and capital market liberalization. For instance, in 2012, the Institute of International Finance posited an increase in net private capital investment in emerging economies to reach \$893 billion by 2015 with more than 50% of capital flows being in the form of equity investments, particularly portfolio and direct investment in stock exchange markets. Stock markets are characterized by their affinity for investors from within and outside the host country boosting capital accumulation while functioning as a platform for efficient capital allocation (Sok-Gee, 2010). The increase in the number of investors trading in stocks increases the amount of available capital, which is then exploited by firms to support business activities, which translate to accelerated economic development in the host economy.

The Indonesian Stock Exchange (IDX) is a highly dynamic stock market since the end of the 2008 financial crisis, and engages active trading of both local and offshore trader. Since its inception in 1912, the IDX has evolved to

integrate remote trading system and online trading platforms transforming capital market into a media for distributing funds and investment depending on the needs of financiers (Armansyah, 2018). In this regard, the IDX became an information hub to guide investors when making investment decisions. During the financial crisis period, portfolio investment was associated with attendant risks. Portfolio investment defined international capital flows, which induce volatility within the financial markets. Based on the World Bank reports, for instance, the total market capitalization prior to the 2008 global financial crisis totaled approximately \$64 billion in the world stock markets (Tanjung, 2016). Following the crisis, the stock exchange elicited partial recovery attaining slightly above \$45 trillion of market capitalization in three years. Narrowing to the IDX, stock markets are continually exhibiting relatively high volatility, which is a major concern to investors and policy makers.

The prevailing practice defining stock market behavior is the allowed influence of Indonesian stock market by stock fundamentals of developed economies, such as the US and Japan, in addition to volatility of the domestic macro-economic variables. On the other hand, based on

findings from previous studies regarding the firm fundamental factors in the relation to stock prices, it is suggested that the influence of stock markets and movement of stock prices are not consistent to the change of stock fundamental values (Becchetti and Giacomo, 2007). Praptiningsih (2011) showed that the level of market efficiency is strong in defining the movement of stock market, particularly in establishing stock price stability in the course of economic crisis. Equally, it is argued in excess-volatility hypothesis that stock prices are too volatile to be correlated to stock fundamental variables. But Lo and Lin (2005) shows that the deviation of the stock price from its fundamental value will not occur longer, because rational investors will be trading in contrary to irrational investors to chase gains, investors who rational will push back stock price towards its fundamental value. Becchetti and Giacomo (2007) argue that stock prices fluctuated around its fundamental values so that must be analyzed by considering fundamental and non-fundamental component. On the other hand, in a 2017 study, Lestari showed that in the event of better performance of stock exchange, the effect is an increase in stock prices, and vice versa with a decline in stock prices if the performance is poor. In this regard, performance is linked to the capacity of a company to generate profits to adequately foster investor confidence in capital investment. Similarly, Al Qaisi, Tahtamouni and Al-Qudah (2016) summated that the determination of stock prices, in view of excess-volatility hypothesis, may be influenced by the return on equity (ROE), which defines corporate performance by impacting on the carrying value of shares vis-à-vis the corporate profit attributable to creditors, shareholders and taste, and return on asset (ROA), which explicates stock efficiency based on assets for net income.

Consistent to efficient market hypothesis by Eugene Fama (1965), stock prices reflected all information concerning the stock markets and individual stock. Equally, this mean that all information about accounting data of stocks is reflected on stock prices. Investors use accounting information, such as earning per share (EPS) and book value per share (BVS), when trading stocks in stock markets. Previous studies (Nagy & Obenberger, 1994; Becchetti & Giacomo, 2007) reveals that stock prices moves around its fundamentals, but other studies reveals that stock prices moves beyond its fundamentals (Siegel, 2014; Miller, 2017). This is because of behavioral factors by investors, which occur in stock market. According to Miller (2017), stock prices tend to fluctuate or stabilize based on the existing behavioral biases elicited by investors, including herding and anchoring. Low price anomaly on stocks, for instance, is posited to perform better in the IDX in the long run in comparison to those set at high prices (Flora & Hutabarat, 2015). Schwert (1989) and Gallant et al. (1992) find the positive correlations between stock price volatility and stock trading volume. Although low priced stocks are hypothesized to be riskier,

they are characterized by high price volatility, and while their prices keep rising, the high-priced stocks keep falling (Stickel, & Verrecchia, 1994).

In the second midterm of the year 2008, the stock market all over the world experienced severe selling pressure so that stock prices dropped significantly. Dow Jones Industrial Average reported 25.54% decline in the USA main stock market and the world, while FTSE 100 London declined by 30.28%, DAX Frankfurt declined by 29.53%, Nikkei 225 Tokyo declined by 38.61%, Hongkong Hang Seng Index declined by 33.06%, and Singapore STI Index declined by 33.90% (Yahoo, Finance, 2009). This fact shows that financial crisis occurs according to Patel and Sarkar (1998) who defined a crash (crisis) in the stock market to occur as a decline in the regional price index by relatively more than 20% in stock exchanges of developed economies, and by more than 35% in stock exchanges of developing economies. In a previous study, Goetzmann and Massa (2008) examined the relationship between stock returns, disposition effect, stock trading volume, and stock price volatility in stock markets. It was established that the higher disposition investor is, the lower stock price volatility, stock return, and stock trading volume. In this regard, Zaremba et al. (2016) used low price anomaly model to summate that when investors overlook the stock prices in defining their disposition, amplified trading increases stock price volatility and behavioral bias. This study, therefore, investigates the relationship between accounting information, stock price, stock behavioral bias by investors, stock trading volume, and stock price volatility in the period of financial crisis (2008 – 2009) focusing on data from corporate stocks at IDX. In the subsequent section, a review of literature, research design, result and analyses, and conclusion are provided.

2. Literature Review

This review relates three theories with accounting measures, stock price, and disposition bias. These theories include efficient market hypothesis, excess volatility hypothesis, and prospect theory. Their review sheds light on how the variables explain the contradictory literature of the results of previous studies about the firm fundamental factors in the relation to stock prices.

Theoretical review

Efficient market hypothesis

Efficient market hypothesis (EMH) argues that stock prices trade at fair value due to active reflection of the information in their prices (Westerlund, Norkute & Narayan, 2014). It further explains that there are three forms of efficient markets. A weak form of efficient market hypothesis asserts that prices of stocks reflect current information that is public to all participants. It agrees with the random walk assertions that currents prices change unpredictably. Past prices can, therefore, not be used to

predict future prices, thereby ignoring the role of technical analysis in stock valuation and price prediction. A semi-strong form indicates the prices of the stocks automatically adjust to reflect old and new information that enters the market. Release of new information is therefore crucial to market participants since it affects the prices of the securities immediately. However, the adjustment of prices happens so rapidly that it is difficult for investors to profit from it.

Forbes (2012) elucidated that a strong form which reflects both public and private information in stock prices cannot make it possible for any participant to earn superior returns. It is also impossible for any investor to purchase inflated or undervalued stocks in such a market. In essence, expert trading through stock selection and timing the market cannot help investors gain higher returns. However, investing in much riskier stocks can increase the expected returns. The assertion that stock prices reflect all the information in the market means no participant can beat the market in generating alphas consistently. Those investors who gain better return than the market average, therefore, gain by a mere chance. However, this assertion is not consistent with the concept of Informational Efficient Market (Fama, 2010), which goes to a greater extent of understanding and application of efficient market hypothesis in financial markets to consistently make better returns than that of the average market.

Shiller's Excess Volatility Theory

Shiller's Excess volatility theory asserts that stock prices are too volatile to be correlated to stock fundamental variables (Giglio & Kelly, 2016). The theory implies that under rational expectations, market prices of stocks fluctuate more in relation to the present value of expected returns (dividends). There is a more significant risk in purchasing a volatile stock than the expected returns. This theory supports the argument that it is possible to beat the market returns by experts. In what efficient market hypothesis asserts impossible, excess volatility theory argues it is possible.

According to Jain and Strobl (2015), it is possible to make a profitable trading strategy and gain returns that are excess of the market. They argued that there are specific patterns exhibited by the stock prices that have not been explained by the efficient market hypothesis. In modern financial markets, trade execution is faster and efficient than before, making it easy to high-frequency traders and algorithmic traders to profit within a short period. As observed by Forbes (2012), the role of financial analysts in both fundamental and technical analysis cannot be wished away, as suggested by EMH. This school of thought, therefore, is critical in this study as it explains why some investors outperform the market in the stock market that is characterized by an efficient flow of information.

Prospect Theory

This theory was put forward in 1979 and developed by Kahneman and Tversky in 1992 to explain the choice making process by individuals involving uncertain probabilistic outcomes (List, 2013). Different market participants faced by a situation of making decisions under risk behave differently according to their risk preference. It related closely with disposition assertions of willingness to maintain a position in times of losses or gains. Individuals, therefore, consider the outcomes of benefits or profit differently from those of loss (Barberis, Mukherjee and Wang, 2014). According to them, an individual presented by choice of making a decision which has an equal probability of either resulting in loss or profit, s/he will choose the option of gaining profit.

Generally, investors are loss-averse (Forbes, 2012). Investors, therefore, choose options that are more likely to bring gains as opposed to losses. The factors that influence an individual in taking positions during stock trading can be psychological. As explained by Favreau (2015), individuals make decisions that may seem irrational in a purely economic model. Additionally, Westerlund, Norkute, and Narayan (2014) argued that there are more significant emotional effects brought by a loss to a decision maker compared to a gain of equal measure. This phenomenon explains why investors opt for positions that have perceived gain. In the stock market, fluctuations in market prices and returns may necessitate an investor to make emotional decisions, thereby creating more loss or profit. Past performances influence the investors' decision in allocating resources and making the distribution. Investors may not allocate resources to transactions that indicate the trend of a loss. The decision maker assigns value to prices and returns. A portfolio is constructed by assigning weights of individual securities to correspond to perceived values. Where a prospect is valued as high, the investor will allocate more resources to that stock and increase its weight in the portfolio (Jadhav, 2018). Similarly, perceived low-value shares are allocated fewer resources and may be removed from the portfolio altogether.

Indonesian Stock Exchange

Capital market in Indonesia has been in existence for a long time. With the current increase in capital market, the demand for financing has also increased. This has necessitated for introduction of stock exchange market as an alternative form of investment among investors. Currently, stock exchange market has been characterized as to be high risk-high returns. Pankaj (2017) maintains that most investors have become interested in the stock exchange market because they have realized investment in the stock market could gain a lot of profit in future. Attah-Botchwey (2014) asserted that the trend of trade in the Indonesian stock market was unique in that everybody in the country could easily tell the trade was either conducted by local or

foreign investors. However, Sias (2004) noted that the uniqueness was only dominant in the Indonesia since the transparency in which the stock exchange was conducted as opposed to other countries such as Korea and US. Wei et al. (2009) supports this transparency in Indonesia by stating that the bargaining power of the foreign investors has turned to be stronger than that of local investors in the stock exchange market. In spite of the fact that Indonesia is civil law jurisdiction that does not encourage the difference between legal and beneficial ownership, the Capital Market Law has been allowing the distinctions by making sure that an investor holds his security benefits in the security account managed by the KSEI with the investor as the custodian. The stock exchange market in Indonesia witnessed great financial crisis in the year 1999 although the trend has changed. Supervision of the Capital Market and Financial Supervisory Agency has been the initiator of the current stability of the stock market exchange in Indonesia (Salmon, 2004). Lastly, Surjawan (2007) reviewed the state of the stock exchange market and noted that the foreign investors had impacted a lot in the capital investment in buying the blue chip stocks especially in the mining banking sectors.

Accounting Measures

To get the reality in the financial statements, numbers have to be used to represent the measure of items in the financial statements. Accounting measurement has been defined as the process by which the monetary value of items; assets, liabilities, income and expenses are determined in the financial statement (Ball, 2001). Measurement needs a selection of measurement to be made. IFRS (International Financial Reporting Standards) for SMEs uses the mix between measuring of a given item at its historical cost and the fair value. IFRS defines fair value as the amount that can be used to exchange an asset or liability in a transaction between the willing party and the one with the knowledge of the fair value concept. In Indonesia, current assets which are held for trading are expected to be measured on the basis of what is within the greater part of the year after the reporting period. The current assets considered in the case of accounting measure are marketable securities, inventories, account receivable and cash equivalents. Akbar, Pilcher and Perrin (2012), in their study, revealed that ILGs has developed more regulatory requirements for the performance indicators that have ensured the financial organizations have changed to be more effective and efficient. Palepu (2001) noted that the presence of high market changing in return leads to high proxy of past profitability in the market resulting to negative distress to the general investors. The rule of the consistency within the accounts that allows eliminating the inconsistencies in the different accounts so that the income statement and the statement of the balance sheet is mostly used in the Indonesian accounting measure in order to be able to reflect the measure on single basis.

Stock Price

Most stable investors have recently shifted their attention and started investing in the Indonesian capital market. Capital gain has been the aim of every investor who transact in the in the capital market. Due to the forces of demand in the supply and demand in the capital market, the stock price has been changing from time to time. When the demand of the stock is high the stock price also goes high while the when the demand for the stock is low, the stock price reduces (Al-Qudah, 2012). Just as in the other stock markets in other countries, stock price changes on daily basis due to the effects of factors such as dividend policy, structure of ownership, systemic risk and company value. The mentioned factors are very essential to the investors as they help them analyze and identify if the conditions of the company are favorable or not for the investment activities. The knowledge of the investors towards a given company gives them ability to predict the possible trends in the stock price. The theory of efficient capital markets has widely been used with Efficient Market Hypothesis (EMH) to show that the behaviour of investors is connected to the reliable information obtained from the market. The EMH theory holds that the efficient capital market is that which share and reflects on the all the viable information so as to ensure the stock price favorable to both the investors and the financial institutions (Arifin, 2007).

Attah-Botchwey (2014) says that the information about the performance of the company can be obtained from the financial publications in the company's financial statement ratios. Attah-Botchwey (2014), further, accentuate that the financial ratio obtained from the company's publication answers the questions on whether the company has effective management criteria that contribute to earnings on the assets, how the company is funded, its liquidity and if the current investors of the company get good rate of returns. According to Gunawan (2012), if the condition and performance of a company is stable and fully supported many investors get attracted to invest in the capital market and this leads to the increase in the stock price. In addition to the increase in the price of stock, investors gain courage to liquidate more in the stock (Monther & Kaothar, 2010). A research conducted by Prasetyo (2013) found that there is positive relationship between leverage and profit realization in the stock prize in Indonesia. Research conducted by Nurmala (2014) found that dividend policy does not affect the stoke policy although some of the studies have contradicted arguing that dividend policy impact positively on the stock prize. The concept of bullish and bearish has been used to show how stock price fluctuate in the capital market. Bullish market in the stock price occurs when prices are rising or are expected to rise. This type of market is usually characterized by high confidence and great hope from the investors where they believe there will be continuous upwards trend in the market gain. Bullish markets mainly occur in a case where the economy is doing

well although it may last for a short period of time. Bearish market on the other hand occurs in a case where there is fall in the prices of the capital market. During the period of bearish the investors lose confidence and start selling their shares instead of buying as they try to run away from trading a loss.

Disposition Bias

List (2013) explained disposition bias as a tendency of tagging an investment as either a gain or a loss. When an investor experiences losses or gains on an investment, they make a perception about the future performance of that security. It is the willingness to maintain a position in times of losses or gain by investors who label the investments as losers or winners based on previous experience. The effect of high disposition on prices of securities is less fluctuation. Investors can, therefore, hang on a risky investment if they believe it will bring gains after a loss. Similarly, they can sell a good stake too early if they mark it as a loser after experiencing benefits. Disposition bias can, therefore, cause losses through capital gains tax, loss of dividends, or security value loss.

Stock exchange markets experience fluctuations of securities prices in financial crisis periods, thereby impacting different investors differently according to their risk appetite. As observed by Forbes (2012) that generally, investors are risk-averse, the majority of them take investment decisions that will minimize risk and maximize gains. Ben-David and Hirshleifer (2012) observed that there is a tendency by investors to sell more in times of more substantial losses or gains. This scenario describes loss-averse investors. The activity of investors, in turn, increases fluctuations in prices. The investors who make significant gains may sell even the winning investments too early in an attempt to lock in profits. On the other hand, investors who experience a considerable loss keep hoping they will break even hence maintain the position for a long time.

Investing in stock can be done emotionally, especially in times of chaos (Rogers, 2014). Investors and other market participants start to panic in a chaotic market, and they result in behaving irrationally. Their decisions are made quickly without following the financial theory predictions such as those advocated by the Efficient Market Hypothesis. The prices during such times tend to be abnormally low. Investors who can contain their emotions take advantage of the bearish market and buy more stocks. Securities usually are underpriced, thereby making them appear less worthy than their intrinsic value. Financial crisis can cause mental distress to investors who may finally dispose of their stocks to avoid further losses (Park & van der Hoorn, 2012). According to their argument, investors do not trust the future will be back to normal any time soon. Fear drives decision making. However, after the crisis, optimism of the bullish market that is recovering starts driving prices further. Disposition bias may, however,

prevent an investor from holding an attractive investment when it begins making gains. Stock prices may rise abnormally due to higher demand brought by the confidence in the market after the crisis. Finally, the prices of the stocks return to the average making gains to investors who may have held securities bought at abnormally low prices.

Market Indicators in the Financial Crisis Period

A financial crisis in the stock market can be caused by excessive risk-taking by participants brought by unrealistic trading terms. Barnett (2015) elucidated that deregulation and panic are the leading causes of the financial crisis in history, such as the one witnessed in 2008. Indicators of the stock market crisis include markets and securities that are over-valued, external market catalysts, and contraction. Observation of one or all the above signs triggers panic and pessimism in stock markets, thereby pushing prices to abnormal lows in the actual crisis.

The over-valued market occurs when the current price earnings ratio (PE) is higher than the average PE. This implies that an investor who buys such a stock will pay a higher price than the intrinsic value of the security. The aggregate company stock price in the market relative to its earnings is the price-earnings ratio. It explains the amount the investor pays for a basic currency unit of the earnings. If the investor pays less, the stock is therefore undervalued, and the PE is low. An over-valued market, thus, creates a false impression that stocks are valuable while they are not. Financial markets anomalies correct themselves but may take longer than the investors' expected (Leonidov, 2015). If it takes longer before panic set in, economic crisis may less likely occur. However, if they realize their stocks were bought at over-valued prices, they start selling them, thereby causing prices to drop even further to the point of undervaluation. Fluctuations are thus observed during the crisis.

According to Gandhi (2016), an external market catalyst to panic can be anything affecting the markets negatively originating away from the market. A terrorist attack or a bomb blast in a country can trigger an alarm in her financial market and end up as a crisis. Similarly, a political or regime change can make markets react negatively. Barnett (2015) attributed disasters to panic. Where investors feel the future is dark, and they are likely to lose their investments in the financial markets, they increase selling activities. This creates fluctuations in prices, and volatility increases the risk more. Majority of investors in the stock markets being risk-averse, sell their stocks until they get undervalued. On the other hand, contraction refers to the introduction of technology that provokes investors' irrational behaviour. They include dotcom bubbles that contributed to market crash in the early 1990s. Introduction of much complex trading algorithms such as high-frequency trading can also indicate an impending crisis.

Patel and Sarkar (1998) defined a crash as the relative decline of regional stock indices by more than 20% for the development countries and more than 35% for the developing countries. The crisis begins in the month when historical maximum index reached until a month before crash occurred. A crash begin as the month at which the stock price index falls below the threshold level. Trough is the month when the stock price index reaches the minimum level during a crisis, and recovery is the first month after a crash, when the index begins to increase after a crash.

Empirical Review

Monther and Kaothar (2010) showed that, if the performance and conditions of a company are good and anchored in stable economic conditions, depositors are enthused to invest in the capital market rendering the demand for stocks to increase, which in turn lead to an increase in stock prices of the company. In this regard, when stock market is transformed in line with the bullish condition, the stock trading volume tends to increase because more investors are encouraged to buy stocks. Equally, Zhao (2013) argue that stock trading volume increases with the transition of a stock market to a bearish condition, which is characterized by an exponential decrease in stock prices rendering more investors to sell the stocks. In an evaluation of stock trading volume in bullish and bearish markets, and in view of the excess volatility hypothesis, rational investors act risk averse to avoid losses. When a stock market is in the bullish condition, most of stock prices continuously increase while the stock trading volume tend to increase because more investors buy stocks, and sell them as soon as the prices begin to increase. On the other hand, Al-Qudah (2012) showed that in the event the stock market is in bearish conditions, the prices of most stocks decline continuously leading to an increase in stock trading volume since more investors sell stocks as soon as possible to limit losses.

On the other hand, the bullish and bearish market conditions are not held constant considering that the behavior of investors is not always rational, particularly in their stock transactions, making investors act under disposition bias. According to Shefrin and Statman (1985), investors are not rational as characterized by a behavior of selling their stocks as soon as they foresee a potential gain, and tend to hold their stocks to long when potential losses are eminent, building a disposition effect. When stock market in bullish condition, the stock trading volume averagely tend to increase since more investors sell stocks soonest possible, as opposed to when stock market is in bearish condition, where the stock trading volume averagely tend to decrease since more investors hold their stocks too long. The disposition effect relationship creased defines a behavior bias of investors selling their stocks when the variance between the highest and lowest prices is low in bullish market conditions, and holding their stocks too long

when the variance between the highest and lowest prices of a stock is high.

Research Gap

Studies carried out by Masum (2014) established that stock profitability as a result of return on equity and dividend polity presents a positive and significant correlation with the prevailing stock prices. Conversely, Hashemijoo, Ardekani and Younesi (2012) concluded in a study that payouts of dividends have a significantly negative relationship with prices of stocks. Similar arguments were anchored on Langkumaran and Nimalathasan (2013) findings, where a significantly positive correlation was established between profitability, systematic risk (beta) and debt to equity ratio (DER) with stock prices. Studies carried out in the recent past on the link between disposition effect, stock returns, stock trading volume and stock price volatility revealed that the higher disposition investor is the lower stock price volatility, stock return, and stock trading volume (Goetzmann and Massa, 2008). Equally, Kumar (2009) explored behavioral bias and their association to financial factors in financial crisis and established that most investors suffers big losses during the financial crisis periods. This study examines disposition bias, stock price, accounting measures and certain market indicators in the financial crisis period focusing on facts from IDX to limit big losses when the financial crisis occur in future economies.

Study Hypotheses

This study was guided by the alternative hypotheses with respect to the accounting values for equity per share (EPS) and book value per share (BVS) as listed below.

H_1 EPS have positive effects on stock price;

H_2 BVS have positive effects on stock price;

H_3 Disposition effects have negative effect on stock price;

H_4 Disposition effect weakens positive effect of the positive interaction between EPS and stock price;

H_5 Disposition effect weakens positive effect of the positive interaction between BVS and stock price;

H_6 Stock transaction volume has negative effect on stock price;

H_7 Stock price volatility has negative effect on stock price.

Summary

The review of the literature above cites that traditional financial theories, such as efficient market hypotheses are still relevant. However, modern behavioural methods, such as the prospect theory, are critical in elucidating investor behaviour, and the role they play in investment outcome. Indonesian stock market is an essential securities market, not only crucial in the region, but also in the global market for the role it plays. Accounting measures choices that are used to value the stocks and the market affect the prices and the firm's fundamentals. Disposition bias influences the decisions of the investors hence affecting the market prices inversely. Although there several

indicators of a looming financial crisis, it important to note potential factors that can induce an emotional influence on investor behaviour, which can lead to the crisis in the Indonesian stock market.

3. Research Design

This study investigates the causal-relationships between the accounting information, stock price, stock behavioral bias by investors, stock trading volume, and stock price volatility in the period of financial crisis (2008 – 2009) focusing on data from corporate stocks at IDX. In order to establish the causal relationships, multiple linear analyses is performed on disposition effects to outlay its relationship with accounting measures, particularly EPS, BVS and stock price in the IDX for the period before, during, and after the financial crisis. Definition of the causal relationships is built on two compound research questions. First, what are the effect of EPS, BVS, investor behavior, stock transaction volume (STV), and trading stock volatility on stock prices? Secondly, what is the effect of investor behavior on positive interaction between EPS and BVS, and stock price?

Stock price is defined as the mean of daily stock closing price of every month with daily stock price of firms as sample obtained from Yahoo Finance. EPS carries a fraction of earning after taxes (EAT) with the number stock issued, defined as monthly earning per share. On the other hand, BVS carries a fraction of the net of total assets less total liabilities expressed with the number stock issued, defined as monthly book value per share.

Indonesian Stock Exchange publishes quarterly firm financial statements. This study uses proxy monthly EPS as the quarterly firm EPS divided by three.

For the monthly firm BVS this study use proxy:

- For the month March, June, September, December, BVS is as state in financial report of the quarter.
- For the other months, BVS January = BVS Dec + [(BVS March – BVS Dec)/3]; BVS February = BVS January + [(BVS March – BVS Dec)/3]; BVS July = BVS June + [(BVS September – BVS June)/3]; BVS October = BVS September + [(BVS December – BVS September)/3], etc.

Disposition effect (DE) is a proxy of investor behavior, which skews to risk averse when in potential gains, or risk seeking when in potential losses. Equally, the proxy is used by Odean (1998), Dhar and Zu (2006), and Goetzmann and Massa (2008) in the formula:

$$DE = PGR - PLR$$

Where:

$$PGR = \text{Proportion of Gains Realized} = \frac{\text{Realized Gains}}{\text{Realized Gains} + \text{Paper Gains}}$$

$$PLR = \text{Proportion of Losses Realized} = \frac{\text{Realized Losses}}{\text{Realized Losses} + \text{Paper Losses}}$$

Chen et al. (2001) illustrated stock trading volume (VOL) as the monthly mean average of total number of stock traded during the day. Similarly, Huang et al. (2006) described stock price volatility (VOT) as the monthly mean average of the variance between the highest and the lowest daily stock price, mathematically illustrated as:

$$Var(GK) = \frac{1}{2} [Ln(High_t) - Ln(Low_t)]^2 - [2Ln(2) - 1] \times [Ln(Open_t) - Ln(Close_t)]^2$$

Where:

$Var(GK)$ = Price volatility (Garman and Klass, 1980);

$High_t$ = Daily highest price;

Low_t = Daily lowest price;

$Open_t$ = Daily opening price; and

$Close_t$ = Daily closing price.

The analysis in this study was based on a population of 398 firms listed in the IDX in the year 2009, from where a sample of 53 firms was selected based on an inclusion criterion that required inclusion of business firms that have more than 75% of total stock market capitalization. In addition, the included firms were required to be listed in the IDX during 2008/09 financial year, and a market capitalization greater than 1 trillion Rupiah, moreover, included firm were required to have a daily trading volume average (in volume) greater than 1.000 lots, daily transaction values average higher than 1 billion Rupiah, and a daily transaction frequencies greater than 100 times.

The determination of disposition effect examined all investor daily transactions of 53 stocks from all 120 brokerage houses in the IDX as described in previous studies (Goetzmann and Massa, 2008; Odean, 1998; Barber and Odean, 2001; Barber, Odean and Zhu, 2009). The linear regression model used is illustrated below.

The effect of disposition effect on the relationship among EPS, stock transaction volume, stock price volatility, and stock price is:

$$SP = a + b_1EPS + b_2VOL + b_3VOT + b_4DE + b_5EPS*DE + e$$

The effect of disposition effect on the relationship among BVS, stock transaction volume, stock price volatility, and stock price is:

$$SP = a + b_1BVS + b_2VOL + b_3VOT + b_4DE + b_5BVS*DE + e$$

Where:

EPS : Monthly earning per share (proxy), expressed as the firm earning after taxes (EAT) divided by the number of stock issued.

BVS : Monthly book value per share (proxy), expressed as the net of firm total assets less total liabilities expressed as a fraction of the number of stock issued;

VOL : Stock trading volume, expressed as the monthly mean of total number of stock traded at the close of each day;

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VOT	: Stock price volatility, expressed as the monthly mean of the variance between the highest and the lowest daily stock price;	EPS*DE	: Moderating variable of DE to EPS and stock price;
DE	: Disposition effect, expressed as the proportion of gains realized less proportion of losses realized;	BVS*DE	: Moderating variable of DE to BVS and stock price;
		SP	: price, expressed as monthly mean of daily stock prices.

4. Result and Analyses

Table 1 shows the regional indices movements during periods of the study year 2008 to 2009.

Table 1: Regional Market Indices during period 2008 – 2009

Date	DJIA		HANGSENG		FTSE 400		AORD	
	Index	Change %	Index	Change %	Index	Change %	Index	Change %
1/2/2008	13,043.96		27,560.52		6,416.70		6,434.10	
1/31/2008	12,650.36	-3.02	23,455.74	-14.89	5,879.80	-8.37	5,697.00	-11.46
2/29/2008	12,266.39	-3.04	24,331.67	3.73	5,884.30	0.08	5,674.70	-0.39
3/31/2008	12,262.89	-0.03	22,849.20	-6.09	5,702.10	-3.1	5,409.70	-4.67
4/30/2008	12,820.13	4.54	25,755.35	12.72	6,087.30	6.76	5,657.00	4.57
5/30/2008	12,638.32	-1.42	24,533.12	-4.75	6,053.50	-0.56	5,773.90	2.07
6/30/2008	11,350.01	-10.19	22,102.01	-9.91	5,625.90	-7.06	5,332.90	-7.64
Jan 08–Jun 08		-12.99		-19.81		-12.32		-17.12
7/31/2008	11,378.02	0.25	22,731.10	2.85	5,411.90	-3.8	5,052.60	-5.26
8/29/2008	11,543.55	1.45	21,261.89	-6.46	5,636.60	4.15	5,215.50	3.22
9/30/2008	10,850.66	-6	18,016.21	-15.27	4,902.50	-13.02	4,631.30	-11.2
10/31/2008	9,325.01	-14.06	13,968.67	-22.47	4,377.30	-10.71	3,982.70	-14
11/28/2008	8,829.04	-5.32	13,888.24	-0.58	4,288.00	-2.04	3,672.70	-7.78
12/31/2008	8,776.39	-0.6	14,387.48	3.59	4,434.20	3.41	3,659.30	-0.36
Jul 08-Des 08		-22.68		-34.9		-21.18		-31.38
1/30/2009	8,000.86	-8.84	13,278.21	-7.71	4,149.60	-6.42	3,478.10	-4.95
2/27/2009	7,062.93	-11.72	12,811.57	-3.51	3,830.10	-7.7	3,296.90	-5.21
3/31/2009	7,608.92	7.73	13,576.02	5.97	3,926.10	2.51	3,532.30	7.14
4/30/2009	8,168.12	7.35	15,520.99	14.33	4,243.70	8.09	3,744.70	6.01
5/29/2009	8,500.33	4.07	18,171.00	17.07	4,417.90	4.1	3,813.30	1.83
6/30/2009	8,447.00	-0.63	18,378.73	1.14	4,249.20	-3.82	3,947.80	3.53
Jan 09 -Jun 09		-3.75		27.74		-4.17		7.88
Jan 08-Juni 09		-32.72		-47.8		-30.9		-43.13

Source: Yahoo Finance

The largest decrease in index occurred in the period of July-December 2008, DJIA -22.68%, Hang Seng -34.90%, FTSE 400 -21.18%, and AORD -31.38%. The largest decrease in monthly index, DJIA occurred in October 2008 at 14.06%, Hang Seng occurred in October 2008 at 22.47%, FTSE occurred in September 2008 at 13.02%, and AORD occurred in October 2008 at 14.00%. The overall decline in the index in the January 2008 - June 2009 period was DJIA -32.72%, Hang Seng -47.80%, FTSE -30.90%, and AORD -43.13%. Based on these data it can be concluded that crashes have occurred in all of four regional stock exchanges, in semester II of 2008.

Indonesia Stock Exchange index has reached its highest record in history on January 9, 2008 at 2,830.26, which subsequently declined continuously to reach its lowest figure of 1,111.39 on October 28, 2008 or a decline of 60.73%. Table 2 shows the movement of Indonesian Stock Exchange composite index in the period 2008-2009:

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Table 2. Indonesian Stock Exchange Index movements during period 2008 – 2009

Date	BEI	Change
	Index	%
1/2/2008	2,731.51	
1/31/2008	2,627.25	-3.82
2/29/2008	2,721.94	3.6
3/31/2008	2,447.30	-10.09
4/30/2008	2,304.52	-5.83
5/30/2008	2,444.35	6.07
6/30/2008	2,349.10	-3.9
Jan 08 - Jun 08		-14
7/31/2008	2,304.51	-1.9
8/29/2008	2,165.94	-6.01
9/29/2008	1,832.51	-15.39
10/31/2008	1,256.70	-31.42
11/28/2008	1,241.54	-1.21
12/30/2008	1,355.41	9.17
Jul 08 - Dec 08		-42.3
1/30/2009	1,332.67	-1.68
2/27/2009	1,285.48	-3.54
3/31/2009	1,434.07	11.56
4/30/2009	1,722.77	20.13
5/29/2009	1,916.83	11.26
6/9/2009	2,026.78	5.74
Jan 09 - Dec 09		49.53
Jan 08 - Jun 09		-25.8

Source: E-trading Securities

Table 2 is an illustration of the financial crisis period (January 2008 to June 2009), the period before the financial crisis (January to June 2008), the period of during the financial crisis (July to December 2008), and the period of after the financial crisis (January to June 2009). The largest decline in the IDX index occurred in the period of July-December 2008 was -42.30%, the largest decrease in monthly index occurred in October 2008 amounting to 31.42%. The decline in the index that occurred in the period January 2008 - June 2009 as a whole was at -25.80%. Based on these data, it can be concluded that the crisis has occurred on the Indonesia Stock Exchange in the period January 2008 - June 2009, which consists of the before crisis period in the first semester of 2008, the period when the crisis occurred in the second semester of 2008, and the first semester of 2009 was the post-crisis period (recovery).

In the period of January to June 2008, SP was positively correlated to EPS and BVS, and negatively correlated to DE, VOL, and VOT as illustrated in the Table 3. Moreover, DE is shown to be negatively correlated to EPS and BVS, SP, and VOT, while eliciting no correlation to VOL.

Table 3. Correlation for the period of January 2008-June 2009

		EPS	BVS	DE	VOL	VOT	SP
EPS	Pearson Correlation	1	0.76	-0.23	-0.11	-0.13	0.78
	Sig. (2-tailed)	.	0.00	0.00	0.00	0.00	0.00
	n	954	954	954	954	954	954
BVS	Pearson Correlation	0.76	1	-0.23	-0.13	-0.11	0.55
	Sig. (2-tailed)	0.00	.	0.00	0.00	0.00	0.00
	n	954	954	954	954	954	954
DE	Pearson Correlation	-0.23	-0.23	1	-0.02	0.05	-0.33
	Sig. (2-tailed)	0.00	0.00	.	0.48	0.09	0.00
	n	954	954	954	954	954	954
VOL	Pearson Correlation	-0.11	-0.13	-0.02	1	0.46	-0.11
	Sig. (2-tailed)	0.00	0.00	0.48	.	0.00	0.00
	n	954	954	954	954	954	954
VOT	Pearson Correlation	-0.13	-0.11	0.05	0.46	1	-0.22
	Sig. (2-tailed)	0.00	0.00	0.09	0.00	.	0.00
	n	954	954	954	954	954	954
SP	Pearson Correlation	0.78	0.55	-0.33	-0.11	-0.22	1
	Sig. (2-tailed)	0.00	0.00	0.00	0.00	0.00	.
	n	954	954	954	954	954	954

Table 4 shows regression result of the effect of DE to the relationship between EPS, VOL, VOT, and SP. The adjusted R² of the financial crisis periods including 0.68,

0.75, 0.73, and 0.76, respectively, with the F value estimated at 0.05 significance level. Analytically, with a CI of 95% or α of 0.05, the regressed are ideal to predict DE, EPS, VOL,

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VOT, EPS x DE, and their effects on SP during the period. (VIF) smaller than 10 depicts a lack in multi-collinearity. According to Dielman (2001), a Variance Inflation Factor

Table 4. Regression Result of the Effect of DE to the Relationship between EPS, VOL, VOT, and SP

Dependent Variable		Unstandardized Coefficients B	t	Sig.	Collinearity Statistics	
					Tolerance	VIF
January 2008-Juni 2009						
1	2	3	4	5	6	7
SP	(Constant)	2887.72	14.13	0.00		
	EPS	8.15	35.45	0.00	0.70	1.42
	VOL	0.00	1.26	0.21	0.78	1.28
	VOT	-2413.27	-3.71	0.00	0.73	1.36
	DE	-2438.88	-5.80	0.00	0.63	1.60
	EPS*DE	-3.52	-3.39	0.00	0.59	1.68
	Adjusted R ²	0.68				
	F	340.67				
	Sign.	0.00				
	n	954				
	α	0.05				
January 2008-June 2008 (Period of Before Financial Crisis)						
1	2	3	4	5	6	7
SP	(Constant)	2782.17	6.25	0.00		
	EPS	11.49	21.38	0.00	0.58	1.71
	VOL	0.00	-2.52	0.01	0.87	1.14
	VOT	-29.54	-0.01	0.99	0.92	1.09
	DE	-4600.24	-4.67	0.00	0.41	2.46
	EPS*DE	1.40	0.53	0.59	0.41	2.45
	Adjusted R ²	0.75				
	F	159.26				
	Sign.	0.00				
	n	318				
	α	0.05				
July 2008-December 2008 (Period of During Financial Crisis)						
1	2	3	4	5	6	7
SP	(Constant)	2185.36	7.99	0.00		
	EPS	6.89	19.74	0.00	0.45	2.22
	VOL	0.00	1.41	0.16	0.85	1.18
	VOT	-3498.48	-4.00	0.00	0.77	1.29
	DE	-1026.25	-1.81	0.07	0.64	1.56
	EPS*DE	-2.85	-2.23	0.03	0.44	2.29
	Adjusted R ²	0.73				
	F	142.24				
	Sign.	0.00				
	n	318				
	α	0.05				
January 2009-June 2009 (Period of After Financial Crisis)						
1	2	3	4	5	6	7
SP	(Constant)	253.96	0.98	0.33		

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	EPS	6.83	26.13	0.00	0.82	1.22
	VOL	0.00	-0.12	0.91	0.65	1.54
	VOT	-1646.79	-2.38	0.02	0.60	1.66
	DE	-368.32	-0.65	0.52	0.63	1.59
	EPS*DE	-7.31	-4.39	0.00	0.77	1.30
	Adjusted R ²	0.76				
	F	169.08				
	Sign.	0.00				
	n	318				
	α	0.05				

The study findings show that EPS had a positive coefficient ($p < 0.05$) for the period before, during, and after the financial crisis, which meant EPS positively affected SP. Secondly, DE had a negative coefficient ($p < 0.05$) for the period before and during financial crisis, which meant that DE negatively affected SP. Conversely, the negative effect of DE to SP was not statistically significant ($p > 0.05$) for the period after financial crisis. Third, the product of EPS and DE presented a negative coefficient ($p < 0.05$) for the period during and after financial crisis, which meant that DE negatively impacted on the positive correlation of EPS to SP. On the other hand, the moderating effect of DE to the

relation of EPS to SP did not occur during the period before the financial crisis. Fourth, the VOL elicited a negative coefficient ($p < 0.05$) for the period before the financial crisis, which meant that VOL negatively affected SP. The negative effect of VOL to SP did not occur during the period of during and after the financial crisis. Lastly, VOT had a negative coefficient ($p < 0.05$) for the period during and after the financial crisis, which meant that VOT negatively affected SP. On the contrary, the negative effect of VOT to SP did not occur during the period of before the financial crisis.

Table 5. Regression Result of the Effect of DE on the Relationship between BVS, VOL, VOT, and SP

Dependent Variable		Unstandardized Coefficients B	t	Sig.	Collinearity Statistics	
					Tolerance	VIF
January 2008-Juni 2009						
	1	2	3	4	5	6
SP	(Constant)	3925.90	14.02	0.00		
	BVS	1.40	17.07	0.00	0.72	1.38
	VOL	0.00	0.98	0.33	0.78	1.29
	VOT	-3591.21	-4.07	0.00	0.75	1.34
	DE	-4295.87	-7.16	0.00	0.58	1.74
	BVS*DE	-0.02	-0.06	0.96	0.56	1.77
	Adjusted R ²	0.40				
	F	108.69				
	Sign.	0.00				
	n	954				
α	0.05					
January 2008-June 2008 (Period of Before Financial Crisis)						
	1	2	3	4	5	6
SP	(Constant)	3615.08	4.97	0.00		
	BVS	2.27	8.75	0.00	0.43	2.35
	VOL	0.00	-1.58	0.11	0.84	1.20
	VOT	-5413.46	-1.65	0.10	0.91	1.10
	DE	-4238.21	-2.71	0.01	0.38	2.60
	BVS*DE	-1.74	-1.98	0.05	0.31	3.23
	Adjusted R ²	0.40				

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	F	36.54				
	Sign.	0.00				
	n	318				
	α	0.05				
July 2008-December 2008 (Period of During Financial Crisis)						
1	2	3	4	5	6	7
SP	(Constant)	3287.40	7.98	0.00		
	BVS	1.13	8.00	0.00	0.50	2.02
	VOL	0.00	0.77	0.44	0.83	1.20
	VOT	-3941.78	-3.08	0.00	0.78	1.29
	DE	-3300.08	-3.69	0.00	0.56	1.79
	BVS*DE	0.71	1.49	0.14	0.46	2.19
	Adjusted R ²	0.41				
	F	38.28				
	Sign.	0.00				
	α	0.05				
January 2009-June 2009 (Period of After Financial Crisis)						
1	2	3	4	5	6	7
SP	(Constant)	1359.28	3.57	0.00		
	BVS	1.16	12.56	0.00	0.84	1.19
	VOL	0.00	0.92	0.36	0.65	1.54
	VOT	-3527.38	-3.49	0.00	0.61	1.63
	DE	-2537.96	-2.86	0.00	0.56	1.78
	BVS*DE	-0.87	-1.50	0.13	0.65	1.54
	Adjusted R ²	0.48				
	F	49.52				
	Sign.	0.00				
	α	0.05				

Table 5 shows regression result of the effect of DE on the relationship between BVS, VOL, VOT, and SP. The adjusted R² in Table 5 for the entire financial crisis period (January 2008 to June 2009), the period before the financial crisis (January to June 2008), the period of during the financial crisis (July to December 2008), and the period of after the financial crisis (January to June 2009) were 0.40, 0.40, 0.41, and 0.48, respectively, with the F value estimated at 0.05 significance level. At CI of 95% ($\alpha = 0.05$), the regression model was ideal to predict DE, BVS, VOL, VOT, BVS x DE, and their effects on SP during the period. The study identified that BVS had a positive coefficient ($p < 0.05$) for the period before, during, and after the financial crisis, which meant that BVS positively affected SP. Second, DE had a negative coefficient ($p < 0.05$) for the period before, during, and after the financial crisis, meaning that DE negatively affected SP. Third, the product of BVS and DE had a negative coefficient ($p = 0.05$) for the period before the financial crisis, meaning that DE negatively weakened the positive correlation between BVS and SP. On

the other hand, moderating effect of DE to the relationship between BVS and SP did not occur for the period during and after the financial crisis. Fourth, VOL exhibited no significant coefficient ($p > 0.05$) for the period before, during, and after financial crisis, translating to no VOL effect on SP. Lastly, VOT had a negative coefficient ($p < 0.05$) for the period during and after the financial crisis, and for the period before financial crisis ($p = 0.10$), meaning that VOT negatively affected SP.

5. Conclusion

From the results, this study argues that the financial crisis was happen in the period of January 2008-June 2009 which can be divided to three periods: before financial crisis period in January-June 2008; during financial crisis period in July-December 2008; and after financial crisis period in January 2009-June 2009. This finding is consistent to the result of Patel and Sarkar (1998) study, which argued that a crash happens when regional stock indices decline by more than

20% for the development countries and more than 35% for the developing countries. The crisis begins in the month when historical maximum index reached until a month before crash occurred. A crash begins as the month at which the stock price index falls below the threshold level. Trough is the month when the stock price index reaches the minimum level during a crisis, and recovery is the first month after a crash, when the index begins to increase after a crash.

It has been established that SP is positively affected by EPS and/or BVS for the period before, during, and after a financial crisis. This result reveals that the higher is the EPS or BVS, the higher is the SP. This is because investors use accounting information relayed via EPS or BVS when making decisions whether to buy or sell stocks. When EPS or BVS of a stock are growing, the bid to buy of the stock by investors increase, while the need to sell the stock tend to decrease making the stock price to increase. With respect to DE, the tendency of investors to act risk averse and/or act risk taking occurs in the IDX for the period before, during, and after a financial crisis and DE affect SP negatively. This means that the more investors act in disposition bias, they are inclined to either make transaction on stocks in the stock market that tend to sell their stocks too soon when there is potential for gains, or act risk taking by being inclined to hold their stocks too long when there is a potential for losses. Consequently, the behavioral bias caused the SP to decrease below the expected prices. In the study, the period during the financial crisis was marked by a bearish market allowing most of stock prices to continuously declining as a result of stocks holding due to potential for losses awaiting to sell them when the price change in the favor of investors. In this regard, disposition bias by investors makes the bearish market in relation to a financial crisis, making stock prices to decrease below the speculated. In the period after the financial crisis, IDX transformed to a bullish market, which was characterized by continuous price increase of all stocks, majority of investors were selling their stocks too soon to avoid the potential losses. Evidently, disposition bias by investors makes the stock prices in a bullish market to decrease below the market forecast.

It is established that disposition bias by investors weaken the positive relationship between EPS and SP for the period during and after financial crisis. While disposition bias may occur during the period before a financial crisis, the negative effect of disposition bias has no effect on positive relationship between EPS and (SP). During the period before a financial crisis, investors use EPS and BVS information in their stock transactions by evaluating EPS more than BVS information. In the period before financial crisis, even if investors act under disposition bias, when stock prices increase, such that investors face potential gains, they hold those stocks with higher EPS longer than the stocks with higher BVS. Stocks with eventual potential gains are sold at higher prices in the long run. The investor

behavior is true since depositors prefer holding stock with higher EPS to get dividends, and continuous to hold them and/or sell stocks following dividend distribution date. When stock prices are declining, potentiating losses to investors, it results in prolonged holding of stocks with higher EPS than the stocks with higher BVS, with eventual disposal of stocks with potential losses at lower prices.

Disposition bias by investors weakens the positive relationship between BVS and SP noted in the period before a financial crisis. It means that even the disposition bias also occurs in the period during and after a financial crisis, the negative effect of disposition bias posits no effect on positive relationship between BVS and SP. In the period during and after a financial crisis, investors use EPS and BVS information in their stock transactions since they tend to consider more the BVS than EPS information. In the period during a financial crisis when stock market is in a bearish condition, investors act under disposition bias with a tendency of holding longer the stock with higher BVS due potential losses than stocks with higher EPS. As a consequence, investors make more losses. In the period after the financial crisis when stock market is in bullish condition, investors may act under disposition bias to hold stocks with higher BVS longer due to potential gains than the stocks with higher EPS. Consequently, investors make more profits.

In this study, VOL is shown to elicit negative effects on SP in the period before the financial crisis, without eliciting any effects on SP for the period during and after the crisis. Conclusively, in the period before a financial crisis, the higher of the VOL is, the lower the SP, while in the period during and after a financial crisis, no effects are exhibited on the relationship between VOL and SP. Similarly, VOT has a negative effect on SP for the period during and after a financial crisis, and with no effect on SP for the period before the crisis. It is concluded that during and after a financial crisis, the higher the rate of the VOT, the lower the SP, while in the period before a financial crisis, no effects are experienced on the relationship between VOT and stock price.

References

1. Akbar, R., Pilcher, R. & Perrin, B. (2012). *Performance measurement in Indonesia: the case of local government*, Pacific Accounting Review. New York: Emerald Group Publishing Limited.
2. Al Qaisi, F., Tahtamouni, A., & Al-Qudah, M. (2016). Factors Affecting the Market Stock Price - The Case of the Insurance Companies Listed in Amman Stock Exchange. *International Journal of Business and Social Science*, 7(10), 81-90.
3. Al-Qudah, M. L. A. (2012). The Factors that affect shares' Return in Amman Stock Market. *Interdisciplinary Journal of Contemporary Research in Business*, 4(6), 1219-1231.

“Disposition Bias Investor Decisions, Accounting Measures, Stock Price, and Certain Market Indicators in the Financial Crisis Period: The Fact from Indonesian Stock Exchange 2008-2009”

4. Altuwajri, B. (2016). Investors' Sentiment and the Stock Market Behavior: An Empirical Analysis of the Saudi Stock Market. *SSRN Electronic Journal*, 6(8), 136-146, doi: 10.2139/ssrn.2889708
5. Armansyah, F. R. (2018). The Disposition Effects on the Financial Crisis of the Indonesian Capital Market. *Jurnal Manajemen Dan Kewirausahaan*, 20(2), 116–121.
6. Attah-Botchwey, E. (2014). The Impact of Dividend Payment on Share Price of Some Selected Listed Companies on the Ghana Stock Exchange, *International Journal of Humanities and Social Science*, 9(1), 179-190.
7. Attah-Botchwey, E. (2014). The Impact of Dividend Payment on Share Price of Some Selected Listed Companies on the Ghana Stock Exchange. *International Journal of Humanities and Social Science*, 4(9-1), 179-190.
8. Badruzaman, J., Neneng, R. A. R. & Firmansyah, I. (2018). The Analysis of Stock Price at Indonesia Stock Exchange. *International Journal of Recent Scientific Research*, 9(7), 27769-27773.
9. Ball, R. (2001). Infrastructure requirements for an economically efficient system of public financial reporting and disclosure. In: Litan, R. E. & Herring, R. (Eds.). *Brookings-Wharton Papers on Financial Services*. Washington DC: Brookings Institution Press.
10. Barber, B. M. & Odean, T. (2001). *The Behavior of Individual Investors*. New York: Elsevier.
11. Barber, B. M., Odean, T. & Zhu, N.. (2009). Systematic Noise. *Journal of Financial Markets*, 2, 547–569.
12. Barberis, N., Mukherjee, A., & Wang, B. (2014). Prospect Theory and Stock Returns: An Empirical Test. *SSRN Electronic Journal*, 3(15), 18-36, doi: 10.2139/ssrn.2528149.
13. Becchetti, L. & Giacomo, S. D. (2007). Deviations from Fundamentals in US and EU Stock Markets: A Comparative Analysis. *The European Journal of Finance*, 13(3), 195-226.
14. Chen, L., Heath, A. G., & Neves, R.J. (2001). Comparison of oxygen consumption in freshwater mussels (Unioniadae) from different habitat during declining dissolved oxygen concentrated. *Hydrobiologia*, 450(), 209-2014.
15. Dhar, R. & Zhu, N. (2006). Up Close and Personal: Investor Sophistication and the Disposition Effect. *Management Science*, 52(5), 726-740
16. Elangkumaran, P. & Nimalathasan, B. (2013). Leverage and its Impact on Earnings and Share Price. *International Journal of Technological Exploration and Learning (IJTEL)*, 2(4), 166-171.
17. Fama, E. (2010). Efficient Capital Markets: A Review of Theory and Empirical Work. *The Journal of Finance*, 25(2), 383.
18. Fama, E. F. (1965). The Behavior of Stock-Market Prices. *The Journal of Business*, 38(1), 34-105.
19. Favreau, C. (2015). Disposition and Prospect Theory: Evidence from Insider Trading. *SSRN Electronic Journal*, 2(5), 88-105.
20. Flora, J., & Hutabarat, F. (2015). Exploring Factors Affecting Stock Price of Indonesia State Owned Bank Listed at Indonesia Stock Exchange. *Academic Research International*, 3(6), 1-8.
21. Forbes, W. (2012). *Behavioural finance* (2nd Ed.). New Dehli: Wiley.
22. Gallant, A., Rossi, P. E., & Tauchen, G. (1992). Stock Prices and Volume. *The Review of Financial Studies*, 5(2), 199-242.
23. Garman, M. B. & Klass, M. J. (1980). On the Estimation of Security Price Volatility from Historical Data. *The Journal of Business*, 53(1), 67-78.
24. Giglio, S., & Kelly, B. (2016). *Excess Volatility*. Cambridge, Mass: National Bureau of Economic Research.
25. Goetzmann, W. N & Massa, M. (2008). Disposition Matters: Volume, Volatility, and Price Impact of a Behavioral Bias. *The Journal of Portfolio Management*, 34(2), 103-125. DOI: <https://doi.org/10.3905/jpm.2008.701622>
26. Goetzmann, W. N. & Massa, M. (2008). Disposition Matters: Volume, Volatility, and Price Impact of a Behavioral Bias. *The Journal of Portfolio Management*, 34(2), 103-125.
27. Gunawan, T. (2012). *Effect of Camel Ratio, Inflation and Exchange Rate on Stock Return (Emperical Study: Bank Listed in Indonesia Stock Exchange)*. Essay, Economics and Business faculty, Diponegoro. University, Semarang.
28. Hashemijoo, M. Ardekani, A. M. & Younesi, N. (2012). The Impact of Dividend Policy on Share Price Volatility in the Malaysian Stock Market. *Journal of Business Studies Quarterly*, 4(1), 111-129.
29. Hwang, S. & Salmon, M. (2004). Market Stress and Herding. *Journal of Empirical Finance*, 11, 585 – 616.
30. Jadhav, A. (2018). Excess Stock Return Comovements and the Role of Investor Sentiment. *CFA Digest*, 48(2), 112-145.
31. Jain, A., & Strobl, S. (2015). The Effect of Volatility Persistence on Excess Returns. *SSRN Electronic Journal*, 5(8), 96-112.
32. Kumar, A. (2009). Hard-to-Value Stocks, Behavioral Biases, and Informed Trading. *Journal*

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- of *Financial and Quantitative Analysis*, 44(6), 1375-1401.
33. Lestari, A. (2017). The Effect Of Fundamental Factors On Stock Price: Empirical Study Share Sector Manufacturing.
34. List, J. (2013). *Neoclassical theory versus prospect theory*. Cambridge, Mass.: National Bureau of Economic Research.
35. Lo, W., & Lin. K. (2005). A Review of the Effects of Investor Sentiment on Financial Markets: Implications for Investors. *International Journal of Management*, 22(4), 708-715.
36. Masum, A. A. (2014). Dividend Policy and Its Impact on Stock Price: A Study on Commercial Banks Listed in Dhaka Stock Exchange. *Global Disclosure of Economics and Business (GDEB)*, 3(1), SSRN: <https://ssrn.com/abstract=2724964>.
37. Miller, J. (2017). Stock Exchange: Going Beyond Fundamentals. *3 Attractive Ideas*. Minyanville, Retrieved May 24, 2019, from <http://dashofinsight.com/stock-exchange-going-beyond-fundamentals-3-attractive-ideas/>.
38. Monther, C., & Kaothar, G. (2010). Macroeconomic and institutional determinants of Stock Market Development. *The International Journal of Banking and Finance*, 7(1), 306-311.
39. Nagy, R.A., & Obenberger, R.W. (1994). Factors Influencing Individual Investor Behavior. *Financial Analysts Journal*, 50(4), 63-68.
40. Nurmala, K. (2006). Effect of Dividend Policy on The Share Price at Otomotive Company Listed in Indonesia Stock Exchange. *Independent Journal*, 9(1), 56-87.
41. Odean, T. (1998). Are Investors Reluctant to Realize Their Losses?. *The Journal of Finance*, 53(5), 1775-1798.
42. Pankaj, K. (2017). Impact of Earning Per Share and Price Earnings Ratio on Market Price of Share: A Study on Auto Sector in India. *International Journal of Research-Granthaalayah*. 5(2).
43. Patel, S. & Sarkar, A. (1998). Stock market crises in developed and emerging markets. *Research Paper 9809*, Federal Reserve Bank of New York.
44. Paul, M., Krishna, H. & Palepu, G. (2001). Information asymmetry, corporate disclosure, and the capital markets: a review of the empirical disclosure literature. *Journal of Accounting and Economics*, 31, 405-440.
45. Praptiningsih, M. (2011). The Indonesian Stock Market Performance during Asian Economic Crisis and Global Financial Crisis. *Challenges of the Knowledge Society - Economy*, 1(1), 1503-1514.
46. Prasetyo A. (2013). *Effect of Leverage and Profitability on Share Price in the Manufacturing Company Listed in Indonesia Stock Exchange Period 2009-2011*, Accounting Field, Economic Faculty, Maritim Raja Ali Haji Tanjungpinang University.
47. Schwert, G. (1989). Why does stock volatility change over time? *Journal of Finance*, 44(5), 1115-1153.
48. Sias, R.W. (2004). Institutional Herding. *Review of Financial Studies*, 17, 165 – 206.
49. Siegel, J. J. (2014). *Stocks for the Long Run 5/E: The Definitive Guide to Financial Market Returns & Long-Term Investment Strategies*. (5th Ed.). Washington DC: McGraw-Hill Education.
50. Sok-Gee, C., Abd Karim, M. Z. & Abd Karim, M. Z. (2010). Volatility spillovers of the major stock markets in ASEAN-5 with the U.S. and Japanese stock markets. *International Research Journal of Finance and Economics* (44), 161-72.
51. Stickel, S. & Verrecchia, E. (1994). Evidence that Trading Volume Sustains Stock Price Changes. *Financial Analysts Journal*, 3, 57-67.
52. Surjawan, A. G. (2007). *Overview of Co-integration between Investment Value of Foreign and Domestic Investors with LQ45, O/N JIBOR and IDR/USD Foreign Exchange Rate*. Unpublished Dissertation, Indonesian University, Indonesia.
53. Tanjung, G. (2016). *Factors That Affect Stock Pricing In Indonesia Stock Exchange*. Conference Paper, Universitas Widyatama.
54. Wei, L., Rhee, S.G. & Wang, S.S. (2009). Differences in Herding: Individual versus Institutional Investors in China, *Working Paper*, Retrieved May 24, 2019 from www.ssrn.com.
55. Westerlund, J., Norkute, M., & Narayan, P. (2014). A Factor Analytical Approach to the Efficient Futures Market Hypothesis. *Journal Of Futures Markets*, 35(4), 357-370.
56. Zaremba, A., Okon, S., Nowak, A., & Konieczka, P. (2016). The low price anomaly: The intriguing case of the polish stock market. *Inzinerine Ekonomika Engineering Economics*, 27(2), 163-174.
57. Zhao, Y. (2013). The Relationship between Share Price Gains: Corporate Performance and Risk. *iBusiness Journal*, 53(23), 110-112.