

# **The Impact of Cultural Shocks on Investor Sentiment and Herding Behavior: An Evidence During Covid 19 Pandemic**

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## **ABSTRACT**

**Aims:** This study investigates herding under covid 19 pandemic. Also, this research aims to measure the effect of investors' sentiment toward herding behavior moderated by culture shock in the emerging market stock exchange.

**Study design:** This study uses a sample of stock that constitutes the liquid index in the emerging market.

**Place and Duration of Study:** The samples of this study are 26 countries incorporated in emerging stock markets. The observation is 10.192. The duration of the research is from December 2019 to June 2021.

**Methodology:** This Research uses the model of Chang et al. (2000) to estimate herding behavior as the dependent variable. The independent variable is investor sentiment measured by the VIX and VXEEM indices. Culture shock is assumed as a moderating variable measured by dummy variables. The variables of cultural shock are divided into three phases: the honeymoon phase at the beginning of the covid virus spreading, the lockdown phase, and the new normal phase. The data for culture shock is taken from WHO data. The research will be analyzed with Moderated Regression Analysis with EViews.

**Results:** The results of this study consist of the following: First, investors in capital markets in developing countries are proven to have anti-herding behavior in making investment decisions during the Covid-19 pandemic. Second, investor sentiment has influenced herding behavior during the Covid-19 pandemic. Lastly, the covid-19 pandemic condition has strengthened investor sentiment to carry out herding behavior, especially in the honeymoon phase or at the beginning of the pandemic. The novelty in this study is introducing the concept of cultural psychology, namely cultural shock as a variable believed to strengthen investor sentiment towards the capital market and cause herding behavior.

**Conclusion:** The results of this study provide helpful information for developing research in the financial and investor behavior in understanding investor behavior during the Covid-19 pandemic. Investor sentiment toward the possibility of a decline in capital market performance gives rise to irrational behavior (herding). In addition, cultural shocks to new habits during the pandemic can also strengthen investor sentiment and cause herding behavior. It should use a more comprehensive research sample from developed capital markets for further research.

**Keywords:** Herding Behavior, Investor's Sentiment, Culture Shock, EViews

## 1. INTRODUCTION

According to traditional financial theory, the dynamics of the stock market are obscure and inexplicable. Classical financial theory assumes that a rational investor will maximize utility and make investment decisions based on all available data. On the capital market, however, these financial theory's assumptions become bare and can only be used to understand actual investor behavior. However, only occasionally is the behavior of investors on the capital market rational. When confronted with uncertainty, investors tend to behave irrationally. This investor behavior can be explained by the theory of financial behavior. According to the prospect theory, developed by Kahneman and Tversky in 1979, investors will respond differently depending on the outcomes they anticipate. When faced with favorable conditions, investors will prefer to avoid taking such risks. When facing a losing condition, investors tend to take risks. This uncertainty and anxiety are frequently caused by the state of the economy, the political climate, and even disease outbreaks that precipitate financial crises.

There are a few distinct ways in which herding behavior might manifest itself among investors. Herding is a state in which people reject their own convictions and blindly follow the actions of other investors or the movements of the capital market. Herding can be dangerous (Bikhchandani, 2001; Hwang & Salmon, 2004a). In a larger sense, the conduct of a group of investors who trade in the same and sustained direction can be characterized as herding (Sias, 2004). The trading decisions of investors based on the consensus of the market are at the center of this herding behavior. When compared to investors in emerging capital markets, investors in developed capital markets are likely to have access to a greater amount of information regarding stock trading in capital markets; as a result, investors in developed capital markets are more likely to engage in herding behavior (Sharma & Thaker, 2015). This herding behavior is connected to several investment risks that are encountered by investors in developing nations. These risks include political instability, economic instability or financial crises, and volatility in foreign currency (Sharma & Thaker, 2015). According to (Cipriani et al., n.d.), herding is a sort of social influence that occurs on the stock exchange.

Herding is a term that describes the tendency of individuals to disregard their own beliefs and their ability to analyze information, which ultimately leads to them basing their decisions on the activities of other investors in the market (Christie & Huang, 1995). According to (Bikhchandani & Sharma, 2001), herding can be intentional or spurious. Intentional herding describes the behavior of investors who deliberately imitate the actions of other investors to follow the market consensus. Spurious herding describes the behavior of investors who unintentionally imitate the actions of other investors. In the meantime, the practice of specious herding refers to the behavior of investors who act in the same manner as other investors in response to receiving the same information. Professional investors are the ones that engage in this behavior. The ability of investors to rationally evaluate information is negatively impacted when investors are subjected to pressure, stress, uncertainty, and worry; as a result, they tend to follow the market consensus. This imitation is carried out to calm their nerves and bring their preferences more in line with those of other investors (Huang & Wang, 2017).

Some studies mention that several crises caused herding behavior such as: (1) Crisis of financial global, (2) investor sentiment ((Mokni, 2020; Philippas et al., 2013a; Teng & Liu, 2014a; Zouaoui et al., 2011), (3) the presence of market sentiment (Blasco et al., 2012), (4) the role of financial analysts (Lin, 2018), (5) the role of forecasters ((Bowe & Domuta, 2004; Chen et al., 2013; Tsuchiya, 2020)), (6) the role of foreign investors (Bowe & Domuta, 2004; Chen et al., 2012), (7) the role of institutional investors (Nakagawa et al., 2012), (8) cascade information (Chari & Kehoe, 2004), (9) the existence of an infectious disease pandemic (Galariotis et al., 2012, 2015, 2016; Hwang & Salmon, 2004; Messis & Zapranis, 2014), (10) government-released macro and micro news (Galariotis et al., 2015, 2016; Hwang &

Salmon, 2004c; Messis & Zapranis, 2014), (11) trading volume (Hanafi & Abaoub, 2016; Hsieh et al., 2011; Vo & Phan, 2017), (12) fear (Huang & Wang, 2017b) and (13) pressure in the market (Demirer & Zhang, 2019; Júnior et al., 2020; Júnior et al., 2020; Stavroyiannis & Babalos, 2017, 2019).

The COVID-19 pandemic is among the conditions characterized by significant levels of uncertainty. Instead of making their own decisions, investors in pandemic conditions tend to imitate most other investors (herding behavior) (Bohl et al., 2014; Dang & Lin, 2016; Jirasakuldech & Emekter, 2020; Mobarek et al., 2013). The market attitude of investors during the Covid-19 outbreak contributes to this herding behavior. Consequently, the emphasis of this study is on the investor attitude connected with pessimism or optimism regarding the stock market during the Covid-19 pandemic. The findings of previous studies regarding the influence of investor sentiment on herding behavior must be consistent. Some prior studies on investor sentiment indicate that investor sentiment affects herding behavior, however other research indicates that investor sentiment does not influence herding behavior (Simoes Vieira & Valente Pereira, 2015).

During the financial crisis, the sentiment index had little effect on herding behavior, according to BenMabrouk (2018). Lee et al. (2002) demonstrates, using the intelligence sentiment index, that sentiment shifts are adversely connected with market volatility. Volatility rises (falls) as investor optimism rises (falls) (pessimistic). Investors' investment activities, namely herding tendency, will be impacted by poor investor sentiment over market circumstances (Aharon, 2020; BenMabrouk & Litimi, 2018; Mokni, 2020; Philippas et al., 2013b; Simoes Vieira & Valente Pereira, 2015; Teng & Liu, 2014b; Zouaoui et al., 2011b). When the market is dominated by investors' sentiment, herding behavior will increase. Pessimistic investors tend to appraise and evaluate risk-risk scenarios more adversely and to reject risk as a result (M. Baker & Wurgler, 2007). This study attempts to repurpose investor sentiment as a variable that can influence herding behavior considering these ambiguous results.

This research aims to contribute to elements that can improve or reduce investor mood to impact herding behavior among investors. This study utilizes the fear investors felt during the Covid 19 pandemic and cultural shock as two components. During the Covid-19 epidemic, this research led to herding behavior by identifying investor emotion. According to the findings of earlier studies, herding behavior happens whenever the stock market falls. The Vietnamese and Taiwanese stock exchanges are among the affected markets. During the Covid-19 epidemic, it was discovered that investors' psychological instability caused the ups and downs in investor sentiment on the stock exchange and prompted herding behavior. In addition to employing investor sentiment as assessed by the VIX and VXEEM indices, which measure the daily volatility of stock return volatility, we also use the CBOE Volatility Index (VIX) and the CBOE Volatility Index (V This study attempts to use various characteristics to define the psychological state of investors that can bolster investor enthusiasm toward equities and lead to herding behavior.

According to psychological theory, cultural shift is one of the potential causes of psychological shock. There are various stages that a person must pass through to comprehend and adapt to a new culture. The early cultural impact on individuals is referred to as the honeymoon phase. The second stage is the stage of adaptation, the third stage is the stage of adjustment, and the fourth stage is the stage of integration (Oberg, 1960). According to the cultural concept and characteristics of the cultural shock connected with the current Covid 19 pandemic crisis, which are described above. It has altered the global culture to stay at home, avoid crowds, wear masks, wash hands, and commercialize slowly; the concept of trade shifts 90 percent to online commerce, and even the learning process is 100 percent online. This condition is indicative of cultural shocks since it causes worry, tension, perplexity, melancholy, and helplessness. This psychological condition can boost investor sentiment and influence their stock market behavior. During the Covid 19 pandemic,

most stock markets suffered extreme conditions, compelling investors to engage in herding behavior. The cultural shock received by investors during the Covid 19 pandemic will improve their stock market sentiment. High fear of mortality and deteriorating economic conditions boosted investor pessimism in the stock market and prompted herding behavior. According to Wines (2021), anger or fear will influence investors' access to knowledge. Before deciding, fearful investors will obtain as much information as possible and read the fine print. Aharon (2020) asserts that when investors' stock market pessimism increases, they will begin to herd. This research's novelty is cultural shock.

This study examines culture since culture is intended to influence daily actions, especially investing decisions. Cups (2018) and Fakir (2018) assert that cultural shocks fluctuate; these cultural shocks are long-lasting. This new cultural shock can either strengthen or weaken an individual's mental health. The shock phase of this study's cultural shock was segmented using dummy variables during the observation period. The initial phase is the honeymoon, which occurs during the first three months of the covid 19 virus's spread, followed by the phase of increased covid virus-related deaths between the end of 2020 and the beginning of 2021. The subsequent phase is the lockdown phase, during which the government executes a policy limiting each country's activity. In addition, the final phase is the new normal phase, in which each country's government uses freedoms resulting from a decline in cases of the propagation of the covid 19 virus or a decline in mortality cases.

The purpose of this study is to reexamine the effect of investor emotion on herding behavior in emerging capital markets during the Covid-19 outbreak. There is a lack of empirical evidence and contradictory theoretical perspectives in the prior literature indicating that investor attitude drives herding behavior (Aharon, 2020; Mokni, 2020; Philippas et al., 2013b; Teng & Liu, 2014b; Youssef & Mokni, 2018). During the global financial crisis in several emerging capital markets, investor emotion does not alter herding behavior (Simoes Vieira & Valente Pereira, 2015). Herding behavior is examined using cultural shocks during the Covid 19 epidemic, which can boost or diminish investor sentiment. This study demonstrates that there is no herding tendency on the emerging stock markets of the world. Investment sentiment has been demonstrated to affect investor behavior. The cultural shocks that occurred during the epidemic, particularly in the early days of Covid-19 (honeymoon phase), have enhanced investor sentiment toward herding behavior. The more investors sense the stress of cultural shifts at the onset of the pandemic, the more it will cause them to make irrational investment decisions and exhibit herding behavior.

## **2.MATERIAL AND METHODS**

### **2.1. Kahneman and Tversky's Theory of Prospects (1979)**

Prospect theory postulates that losses and gains are evaluated differently, and that individuals base their decisions on perceived gains over losses. When the individual is presented with two options, one with advantages from an analysis and the other with negatives, the individual will favor the profit analysis. Investors will act differently based on the outcomes they will experience. When investors are confronted with favorable conditions (gains) or hopeful (positive) circumstances, they tend to be risk averse. When investors are confronted with loss conditions (loss) or negative events, they tend to take greater risks (risk lover). (Tversky and Kahneman;1979).

The characteristics of the lead theory include I the certainty effect, which occurs when a person desires a particular outcome and encourages him or her to avoid risk when there is a certain profit prospect. Such is the case for those who desire risk when one of their alternatives is a certain loss. (ii) The isolation effect happens when the individual is provided with two options that lead to the same outcome but by different means. Individuals tend to disregard similar facts to simplify their thinking, and their conclusions will change based on how the option is framed. In this study, this argument explains investors' irrational reluctance

to speculate with high rewards as opposed to losses. Fear of death and economic instability during the Covid-19 epidemic, as well as investors' cultural shock at the beginning of the pandemic, have strengthened investor sentiment towards the market. Investors become susceptible to certainty, risk, and ambiguity, which results in capital market herding.

## 2.2 Herding Behavior

(Economou et al., 2015) defines *herding* as a situation in which rational people begin to behave irrationally with the adoption of the judgments of others while making decisions. *Herding* can be defined as any similarity of behavior/inequality conveyed by individual interactions. Nofsinger and Sias define (1999) herding as a group of investors who trade in the same direction over a period. Defines (Christie & Huang, 1995b) herding as the behavior of investors who do not make investment decisions based on their rational analysis but follow the actions of others. *Herding behavior* is an environment in which investors follow the group's decisions, even if it differs from their signals. Investors' herding can disrupt market stability by moving the price of security out of equilibrium as one who tends to make a biased view of the expected risks and returns of specific securities based on the majority view. Investors tend to hide their personal information and act on signals received with the observation of the actions of other investors. Investors will act on the judgments that others make.

Lakonishok et al. define (1992) herding as the average tendency of a group of money managers to buy or sell stocks relative to what can be expected if the money manager trades independently. They will observe the trading patterns of a particular group and tend to buy and sell the same stock as that group. Nofsinger and Sias define (1999) herding behavior as a collective behavior that arises from uncoordinated individual choices. Herding behavior refers to a group of investors who trade in the same direction over time.

(Christie & Huang, 1995b) which identifies herding behavior using a measure of dispersed cross-sectional stock returns and found that the spread of herding increases during the market rises and relatively falls as the market falls. Another model is the model proposed, which is a modification of the model proposed by measuring the dispersion of securities from the market (Chang et al., 2000) (Christie & Huang, 1995b) returns (CSAD) or irrational dispersion.

## 2.3 Investor Sentiment

Investor sentiment is also interpreted as an investor's optimism or pessimism towards future stock market activity or as a way for investors to form beliefs. (Baker & Wurgler, 2007) (Barberis et al., 1998). The factors that can affect investor sentiment are sociological, psychological, emotional, and fashion factors. Investment decisions are unlikely to be made based on rationality (Blasco et al.). These factors are taken from two basic assumptions, i.e., some investors are driven by sentiment and fundamental information that will be adapted to the investor's trading strategy to react to other market participants. indicates that investor sentiment contributes to investor (2012b) (Blasco et al., 2012c) herding behavior and market sentiment.

Some researchers propose ways of measuring investor sentiment. Investor sentiment can be measured directly or indirectly. Directly, namely using questionnaires or direct surveys. A frequently used measure for direct assessment of investor sentiment is the Michigan Consumer Sentiment Index (MCSI) or Investors' Intelligence, which refers to market variables such as closed fund discounts (CEFD). Meanwhile, the indirect measure uses data from the market or the investor sentiment index. Frequently used measures are the equity market sentiment index (EMSI) or the Baker and Wurgler indices. The turnover rate of stock sales and fund discount rate calculates the NCICSI index. Another indicator is the VIX index, which measures the volatility of the S&P 500 index (Qiu & Welch, 2004; Baker & Wurgler, 2007; Gao & Süß, 2015) option. Another measure is the use of the VXEM

index, which is an index that measures investor sentiment, specifically in emerging stock markets.

## 2.4. Cultural Shock

Oberg defines cultural shock as anxiety that is the result of losing all the familiar signs and symbols of social relationships. Cultural shocks are seen as temporary stress reactions in which prominent psychological and physical states are generally uncertain and difficult to control or predict. A person will tend to feel anxious, confused and apathetic until the individual can develop a new cognitive constructive to understand and apply the appropriate behaviors.(1960)

Pedersen suggests that (1995)*culture shock* consists of several stages involving ongoing processes, reorganization and restructuring that occur cognitively, emotionally and physically. It is this process that drives the transformation and change of the individual towards more tangible self-development.

1. The first stage: *honeymoon* (honeymoon) that is, the first stage of occurrence of this cultural shock is the honeymoon, or the stage of rising. During this stage, people will move from what was once just a dream or hope for a better situation to a better actual life. Here the individual will feel enthusiasm, excitement or anxiety entering unknown territory. A person will be forced to change lives and pursue the hope of survival in the search for salvation.
2. The second stage: disintegration or fall. At this stage the person will experience a more complex state of mind dominated by confusion and disorientation in relation to expectations from others and expectations from oneself, as well as feelings of disconnection from one's environment. There is so much new information to be processed that the person feels overwhelmed.
3. The third stage: is reintegration or learning to walk again. It is characterized by an increased sense of hostility and anger directed towards others. People will get used to their new identity and begin to adapt to the new culture that exists.
4. The fourth stage is autonomy. This stage is characterized by a level of organizational experience that facilitates the development of new perspectives, skills and understanding of the new culture and identity of a person. People will be more skilled at learning how to balance more things in life: activities, family, work and various aspects of the new culture.
5. The fifth stage is interdependence. This stage is not the end of a process but rather an expression of the dynamic tension that occurs between the self and the culture from which new perspectives can be developed.

## 2.5 Investor Sentiment and Herding Behavior

The theoretical literature on investor sentiment and herding behavior consists of two views: (i) sentiment can give rise to herding behavior, and (ii) sentiment views can reduce herding behavior. Theories that highlight the role of investor sentiment on investor behavior bias, especially herding behavior, argue that investor sentiment is a psychological factor that is influenced by the physical, psychic, and external environment of the human being, forms the system, and influences the behavior and attitudes of an individual. Kahneman and Tversky (1979) say that the individual's behavior differs from his practice in theory. So, the classical mathematical model of finance cannot explain an investor's financial decisions.

The prospect theory proposed by Kahneman and Tversky (1979) states that individual behavior exists in various ways of facing situations of uncertainty as measured by risk, some approaching and some even staying away from risk. Herding behavior is a behavior that tends to avoid losses or risks. Philippas, Economou, Babalos and Kostakis (2013b) show that poor investor sentiment about market conditions and the presence of economic shocks will increase herding behavior.

Teng and Liu (2014b) examined the Chinese stock market; during the financial crisis, Taiwan and Hong Kong stock markets had investor sentiment influencing herding behavior. Furthermore, Abbes (Abbes, 2013) found a relationship between investor sentiment and herding behavior. This behavior is further increased during crises compared to calm periods in financial markets. Similarly, Aharon (2020) based on his research, managed to prove that investor sentiment increased herding behavior during the crisis in 2008 and 2011 in Europe.

Zouaoui (2011b) said that investor sentiment increased during a crisis in the stock market over a period of 1 year. This sentiment is felt in countries that are culturally more prone to group behavior, overreaction, and low institutional involvement. The existence of too pessimistic or optimistic expectations affects the price of assets for a significant period and eventually leads to a crisis. Investor sentiment affects the occurrence of a crisis in the stock market over one year. Investor sentiment also provides additional predictive power from the crisis compared to other variables. The impact of investor sentiment on the stock market is stronger in countries that are culturally more vulnerable to the behavior of groups and institutions with low levels of efficiency.

This Research refers to the view of prospect theory because it argues that the environment and circumstances that occur will impact a person's psychology. The higher a person's psychological pressure, the more biased an individual will behave like herding behavior. So, the sentiment of an investor will cause herding behavior. The higher the investor sentiment, the more likely it is to increase its herding behavior. The cultural shock investors feel will strengthen investor sentiment's influence and cause herding behavior.

**H1: There is a herding behavior in the emerging stock market during the covid 19 pandemic**

**H2a: Investor sentiment proxied with the VIX affects herding behavior.**

**H2b: Investor sentiment proxied with VXEEM affects herding behavior.**

## **2.5 The Role of Cultural Shocks as a Moderation of the Influence of Investor Sentiment on Herding Behavior**

The theory of cultural shock, with reference to the theory of cultural learning, says that the existence of cultural changes felt by a person can cause a reaction in the individual. These reactions can be attitudes, feelings and emotions and indirectly convey feelings such as liking, friendliness, domineering and trust. Socially skilled individuals tend to be sensitive to how others respond to them and what happens around them psychologically. On the contrary, socially inadequate individuals have not mastered the conventions of their society, either because they are not aware of the rules of social behavior that govern interpersonal behavior in their culture or, if aware of those rules, are unable or unwilling to obey them.

The psychological state of investors can also be influenced by anxiety about whether investor behavior is evaluated positively. Prospect theory is also used in the explanation of behavior in situations where cultural shocks are affected by sentiment. Schein (1990) says that cultural shocks impact the individual level and have a huge effect at the community level. Fakir (2018) investigates the influence of psychological and social problems that can affect individuals and result in cultural shocks. The study's results stated that the curve of cultural shocks could go up and down and be sustainable for a long period. This trend can turn up or down if social psychological problems negatively affect the individual's ability to adjust to a new culture.

The current Covid-19 pandemic has changed most countries' cultures, especially developing stock market countries. This cultural shock gives rise to stress and behavioral biases. Investors who experience the psychological effects of these cultural shocks may tend to be more pessimistic about the market (rising investor sentiment) and engage in herding behavior.

- H3a: Cultural shocks in the honeymoon phase may strengthen or weaken the influence of investor sentiment proxied with the VIX on herding behavior.
- H3b: Cultural shocks in the lockdown phase may strengthen or weaken the influence of investor sentiment proxied with the VIX on herding behavior.
- H3c: Cultural shocks in the new normal phase may strengthen or weaken the influence of investor sentiment proxied by the VIX on herding behavior.
- H3d: Cultural shocks in the honeymoon phase may strengthen or weaken the influence of investor sentiment proxied by VXEEM on herding behavior.
- H3e: Cultural shocks in the lockdown phase may strengthen or weaken the influence of investor sentiment proxied by VXEEM on herding behavior.
- H3f: Cultural shocks in the new normal phase may strengthen or weaken the influence of investor sentiment proxied by VXEEM on herding behavior.

### 2.3. Theoretical Framework

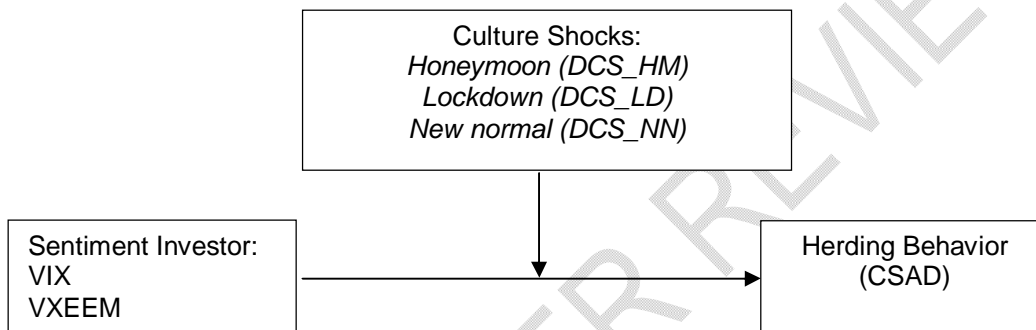


Figure 1: Theoretical Framework

#### Description:

Herding Behavior: CSAD

Investor sentiment: VIX and VXEEM indices

Cultural shocks: dummy variables divided into 3 phases, the honeymoon (HM), lockdown phase (LD) and new normal phase (NN).

The model above consists of independent variables, such as investor sentiment, which is proxied by VIX and VXEEM, and moderation variables, such as cultural shocks, which are measured by three differences in the ups and downs of covid 19 cases. The honeymoon phase (HM), the lockdown phase (LD), and the new normal phase distinguish cultural shocks (NN). While herding behavior, as measured by the value of cross-sectional absolute deviation, is the dependent variable (CSAD). Model 1 assesses the role of fear, as measured by GFI and SI, in influencing investor sentiment toward the occurrence of herding behavior in emerging stock markets.

### 3. Research Design

#### 3.1 Measurement Instrument

The purpose of this study is to test hypotheses that explain the relationship between independent and dependent variables. It is a causal study in which the researcher seeks to identify the root cause of a single problem and establish a definitive causal relationship. This study attempts to manipulate variables to investigate the effects of such manipulations on bound variables. This study's analysis unit is stock market investors in emerging stock market countries. Studies are conducted using data that is only collected once daily to answer research questions.

The Dependent Variable in this research is herding behavior. The measurement herding behavior in Research using models from (E. C. Chang et al., 2000) because this model is a modification of the Christie and Huang (1995) model. This model measures the level of stock dispersion using the cross-sectional absolute deviation (CSAD) model of stock returns. The model uses non-linear regression to estimate the relationship. The steps in the measurement are as follows.

Calculating  $R_m$  and  $R_{m,t}^2$  is calculated based on the value of the market return, whose formula is:

$$R_{m,t} = P_{m,t} - P_{m,t-1} / P_{m,t-1}$$

Information:

$R_{m,t}$ = market return at time t

$P_{m,t}$ = closing price of the market stock at time t

$P_{m,t-1}$ = closing price of a market stock at time t-1

1. Calculates the value of  $R_{i,t}$ , which is based on stock returns by using stock data as follows:

$$R_{i,t} = P_{i,t} - P_{i,t-1} / P_{i,t-1}$$

Information:

$R_{i,t}$ = return on shares of a company i at time t

$P_{i,t}$ = closing price of the company's shares to i at time t

$P_{i,t-1}$ = closing price of the company's shares to i at time t-1

2. Calculating CSAD values

CSAD values are calculated with the use of Chang et al. (2000) models:

$$CSAD_t = 1/N \sum_{i=1}^N |R_{i,t} - R_{m,t}|$$

Information:

$CSAD_t$ = cross-sectional absolute deviation at time t

$R_{i,t}$ = individual stock return at time t

$R_{m,t}$ = market return at time t

N= number of companies on the sample.

Chang et al. (2000). Gleason et al. (2004), and Tan et al. (Tan, 2008) using a model from CSAD:

$$CSAD_t = \alpha + \beta_1 |R_{m,t}| + \beta_2 (R_{m,t})^2 + \varepsilon_t$$

Negative and significant values for coefficient  $\beta_2$  is evidence of herding behavior.

This study used one independent variables: investor sentiment. This variable is measured using two investor sentiment indices, VIX and VXEEM. The VIX measures market volatility for a bearish or bullish direction. When this index rises, investors believe in significant risks that the market could move sharply, downwards, and upwards. A high VIX occurs when the average investor anticipates that there could be a potential big movement in the market. The VIX is low when investors do not feel any downside risks or significant upside potential. When this index is above level 30, it means the potential for high volatility due to pressure and fear that causes investor sentiment. The VIX index below level 20 reflects reduced sentiment in the market, which can lead to the high volatility (CBOE Index, 2020).

The second measure of investor sentiment is the use of the VXEEM index. This special index is used to measure investor sentiment in emerging stock markets. This index measures the volatility of stocks in emerging stock markets in Morgan Stanley Capital International Emerging Market ETF (MSCI EEM) stock data. VXEEM follows the algorithm of the VIX. VBEEM (volatility of bid emerging ETF market) and VAEEM (volatility of ask emerging ETF market) are variations of VXEEM that use their respective bid and ask prices in their calculations. The higher value of VXEEM indicates higher investor sentiment towards the market. This VXEEM index data was obtained from the investing.com website with daily data usage from December 1, 2019, to June 30, 2021.

The Moderation variable is Cultural Shock. Oberg (1960) defines cultural shock as anxiety resulting from losing all the familiar signs and symbols of social relationships. Cultural shocks are temporary stress reactions whose prominent psychological and physical states are generally uncertain and difficult to control or predict. A person becomes anxious, confused, and apathetic until the individual can develop a new cognitive constructive to understand and apply the appropriate behavior.

The model was created using perceptions from Pedersen (1995) and Cupsa (2018), positing that culture shock consists of several stages involving continuous processes, reorganization and restructuring that occur in cognitive, emotional, and physical areas. It is this process that drives the transformation and change of the individual towards more tangible self-development.

1. At the beginning of the pandemic, it was called the honeymoon (HM) stage. It happens at the beginning of 2020, at the end of 2020 and in the first quarter of 2021. This variable is perceived that  $D=1$  if there is an increase in covid 19 cases and  $D=0$  other than that. Each country's data is based on a graph of the development of the covid 19 pandemic on the Oxford University website.
2. During the lockdown (LD), namely on March 1, 2020 – June 30, 2020, during the lockdown re-enactment in the first quarter of 2021. This stage is called the disintegration stage. The perception is that  $D=1$  if there is strictness of government policies related to staying at home, and  $D=0$  apart from that. Each country's lockdown data is based on each country's government's stay-at-home or work-from-home policy. This data is obtained from the stringency index.
3. In the new normal (NN) period, namely the adaptation period, on July 1, 2020 – December 31, 2020, and in the second quarter of 2021. This variable perceives that  $D=1$  if government policies have been relaxed regarding the covid 19 pandemic, and  $D=0$  apart from that. Each country's new normal data is based on loose government policies, below 70 on the stringency index and the exit of face-covering policies.

Table 1. Variable Definitions and Data Sources

Variable	Indicator	Source
Herding Behavior	CSAD	Data on the Stock Exchange
Investor Sentiment	VXEEM	VXEEM index in Investing.com
Fear	GFI	WHO Global Fear Index website
Cultural Shock	Dummy 1 and 0	Stock Exchange Data

### 3.2 Data Collection

The population of this study is emerging stock markets that are members of the MSCI (Morgan Stanley Capital International) index. This index measures the performance of stock markets in emerging markets. Sampling in this study can use the purposive sampling technique, which is a sample determination technique with certain considerations. Purposive sampling is the selection of non-random samples whose samples must meet the criteria or requirements that have been adjusted to the problem of this study. The sample criteria in this study are stock exchanges summarized in the developing stock exchange.

Countries summarized in emerging stock markets include South Africa, Argentina, Brazil, Chile, China, Philippines, India, Indonesia, Colombia, Korea, Malaysia, Pakistan, Poland, Qatar, Russia, Taiwan, Thailand, Turkey, United Arab Emirates, Greece, Peru, Egypt, Hungary, Saudi Arabia, Czech, and Mexico ([www.msci.com](http://www.msci.com)). The data used are daily data for market returns, data on covid 19 cases and covid 19 death cases, and data on the stringency index. The number of observations in this study was 10,192 observations.

The analysis method used in this study is statistical analysis. Statistical analysis is carried out to analyze sample data and data that have been obtained that are used for hypothesis testing (Sugiyono, 2016) The data analysis obtained in this study can be processed using the help of the EViews application program.

Table 2. Indices On foreign m foreign countries summarized in emerging stock markets

Country Name	Index Used	Data Sources
Argentina	S&P Merval	Investing.com and Yahoo Finance
Brazil	BOVESPA BRAZIL 50	Investing.com and Yahoo Finance
Chile	S&P CLX IPSA	Investing.com and Yahoo Finance
Colombia	COLCAP	Investing.com and Yahoo Finance
Mexico	E-pasts	Investing.com and Yahoo Finance
Peru	SPBLPGPT	Investing.com and Yahoo Finance
Czech Republic	PX	Investing.com and Yahoo Finance
Greek	ATG	Investing.com and Yahoo Finance
Hungary	BUX	Investing.com and Yahoo Finance
Poladian	WIG30	Investing.com and Yahoo Finance
Qatar	QSI	Investing.com and Yahoo Finance
Russia	MOEX	Investing.com and Yahoo Finance
Saudi Arabia	MISAT0002PSA	Investing.com and Yahoo Finance
South Africa	South Africa's TOP 40	Investing.com and Yahoo Finance
Turkish	BIST 100	Investing.com and Yahoo Finance
United Arab Emirates	ADI	Investing.com and Yahoo Finance
China	CSI 1000	Investing.com and Yahoo Finance
Indonesian	COMPASS 100	Investing.com and Yahoo Finance
India	SPCITIC 300	Investing.com and Yahoo Finance
Korea	KOSPI 51	Investing.com and Yahoo Finance
Malaysia	Malaysia TOP 100	Investing.com and Yahoo Finance
Pakistan	Karachi 100	Investing.com and Yahoo Finance
Philippines	PSEI COMPOSITE	Investing.com and Yahoo Finance
Taiwan	TPEX 50	Investing.com and Yahoo Finance
Thailand	SET 100	Investing.com and Yahoo Finance
Egypt	EGX30	Investing.com and Yahoo Finance

### 3.3 Data Analysis

### Multiple Linear Regression Analysis

The initial analysis was performed with several equations for multiple linear regression analysis, which includes:

1. To test whether herding behavior occurs:

$$CSAD = \alpha + \beta_1 AbsRm + \beta_2 Rm^2 + \varepsilon \dots\dots\dots(1)$$

If the value of  $Rm^2$  is negative, it is suspected that herding behavior occurs in developing countries stock markets.

2. To test whether there is an influence of sentiment on herding behavior:

$$CSAD = \alpha + \beta_1 AbsRm + \beta_2 Rm^2 + \beta_3 Rm^2 * VIX + \varepsilon \dots\dots\dots (2)$$

$$CSAD = \alpha + \beta_1 AbsRm + \beta_2 Rm^2 + \beta_3 Rm^2 * VXEEM + \varepsilon \dots\dots\dots (3)$$

3. To test whether there is a direct influence of cultural shocks proxied by the index of 3 phases of cultural shocks during the covid 19 pandemic.

$$CSAD = \alpha + \beta_1 AbsRm + \beta_2 Rm^2 + \beta_3 Rm^2 * dcs\_hm + \beta_4 Rm^2 * dcs\_ld + \beta_5 Rm^2 * dcs\_nn + \varepsilon \dots (6)$$

4. The equation below is a moderating equation with cultural shocks as variables that are thought to moderate the influence of sentiment on herding behavior:

$$CSAD = \alpha + \beta_1 AbsRm + \beta_2 Rm^2 + \beta_3 Rm^2 * dcs\_hm + \beta_4 Rm^2 * VIX * dcs\_hm + \varepsilon \dots\dots (4)$$

$$CSAD = \alpha + \beta_1 AbsRm + \beta_2 Rm^2 + \beta_3 Rm^2 * dcs\_hm + \beta_4 Rm^2 * VXEEM * dcs\_hm + \varepsilon \dots (5)$$

$$CSAD = \alpha + \beta_1 AbsRm + \beta_2 Rm^2 + \beta_3 Rm^2 * dcs\_ld + \beta_4 Rm^2 * VIX * dcs\_ld + \varepsilon \dots\dots\dots (6)$$

$$CSAD = \alpha + \beta_1 AbsRm + \beta_2 Rm^2 + \beta_3 Rm^2 * dcs\_ld + \beta_4 Rm^2 * VXEEM * dcs\_ld + \varepsilon \dots\dots\dots (7)$$

$$CSAD = \alpha + \beta_1 AbsRm + \beta_2 Rm^2 + \beta_3 Rm^2 * dcs\_nn + \beta_4 Rm^2 * VIX * dcs\_nn + \varepsilon \dots\dots\dots (8)$$

$$CSAD = \alpha + \beta_1 AbsRm + \beta_2 Rm^2 + \beta_3 Rm^2 * dcs\_nn + \beta_4 Rm^2 * VXEEM * dcs\_nn + \varepsilon \dots\dots\dots (9)$$

### 4.RESULTS AND DISCUSSION

The descriptive statistical results of this study are as follows:

Table 3 Descriptive Statistics

Variable	Obs	Average	Minimum	Maximum	Std Deviation
CSAD	10,192	0.019	0.00	0.987	0.021
VIX	10,192	26.211	12.10	82.690	11.029
VXEEM	10,192	27.299	14.19	92.460	10.589
DCS_HM	10,192	0.236	0.00	1.000	0.425
DCS_LD	10,192	0.631	0.00	1.000	0.483
DCS_NN	10,192	0.816	0.00	1.000	0.387

Source: Data processed, EViews 2022

In the table above, the number of observations of this study is 10,192. The average value of CSAD for countries, including emerging capital markets, is 0.019297. Emerging stock market conditions recorded a low CSAD average with a range below 0.5. The minimum value of CSAD is 0, and the maximum is 0.987719. Meanwhile, the standard deviation of CSAD is around 0.09%, which means that the volatility of stock returns of companies on the liquid index in 26 countries summarized in emerging stock markets has increased or decreased by 0.09% during the Covid-19 pandemic. On average, the dispersed return or CSAD value of stocks in 26 emerging markets is positive and low.

Investor sentiment proxied with the VIX; it is known that the average value of the VIX is 26.21, which means that the stock market operates in low-risk conditions. The value of the VIX index indicates low investor sentiment when the value of the VIX is in the range of 1 to 20. The average value of the VIX index in this study is 26.21, which means that the stock market is in a state of panic or turmoil. The highest value of the VIX that occurs in the

emerging stock market is 82, which means that during the covid 19 pandemic, there has been turmoil and panic in the stock market, which increases stock volatility and indicates that investor sentiment over the stock market is high.

The following index of investor sentiment is VXEEM. The value of this index indicates low investor sentiment if the value of the VXEEM index is still in the range of 1 to 20. The results showed that the average value of VXEEM was 27.30, indicating that the emerging capital market is volatile and shows signs that investors are panicking about the state of the Covid-19 pandemic. The maximum value of this index is 92, which means that the stock market developed during the covid pandemic has been affected by investor sentiments that feel fear and panic.

Cultural shocks are simulated during the honeymoon phase, the disintegration phase (lockdown), and the reintegration phase (new normal). The honeymoon period began in early 2020 and will be repeated in several countries at the end of 2020 and in the first half of 2021. After the honeymoon phase, the disintegration phase was observed in early 2020, as measured by restrictions on people's activities outside the home. Finally, in the second half of 2020, the reintegration phase was marked by new rules for wearing masks when doing activities outside the home.

The results of the regression test to see the presence or absence of herding behavior in the exchange are as follows:

Table 4. Regression Tests for Testing Herding Behavior

Variable	Coefficient	T Statistics	Probability	
$CSAD = \alpha + \beta_1 AbsRm + \beta_2 Rm^2 + \varepsilon$				
C	0.0142	73.52	0,0000	<b>There is no herding behavior. H1: Rejected</b>
Rm <sup>2</sup>	0.673	35.62	0,0000	
AbsRm	0.415	35.17	0,0000	
R-squared			0,5294	
Adjusted R-squared			0,5281	
F Statistics			423,49	
Probability			0,0000	

Source: Data processed, EViews 2022

In the table above, the research model is declared to be fit, with a probability level of 0.0000. The ability of variable X to explain variable Y is 52.8%. To see if any herding behavior on the stock exchange is from the value of Rm<sup>2</sup>. If the value of Rm<sup>2</sup> is negative, it means a herding behavior on the stock exchange. The results of this study showed that the value of Rm<sup>2</sup> was positive, which means that the overall sample was not proven to occur in 26 developing stock exchanges in the world.

### 3.1. Investor Sentiment Proxied by VIX and Herding Behavior

The results of the study that tested investor sentiment (VIX) towards herding behavior are shown in the table below:

Table 5. Investor Sentiment Regression Test (VIX) Results on Herding Behavior

Variable	Coefficient	T Statistic	Probability	
$CSAD = \alpha + \beta_1 AbsRm + \beta_2 Rm^2 + \beta_3 Rm^2 * VIX + \varepsilon$				
C	0.014	73.13	0.0000	<b>H2a accepted</b>

AbsRm	0.419	35.21	0.0000
Rm <sup>2</sup>	0.677	35.67	0.0000
dRm <sup>2</sup> *VIX	-0.015	-2.40	0.0162
R-squared			0.5303
Adjusted R-squared			0.5289
F Statistics			408.72
Probability			0.0000

Source: Data processed, EViews 2022

Based on the results of the regression test, it is known that the statistical F value is 408.72, and the probability is 0.0000, which means that the above model is fit and worthy of testing. The value of adj R<sup>2</sup> is known that the independent variable, investor sentiment, can influence the dependent variable, namely herding behavior, by 52.8%. Testing hypothesis 2a to prove the presence or absence of herding behavior influenced by investor sentiment. Investor sentiment in proportion to the VIX has proven to influence herding behavior. In the equation above, the probability value is worth 0.0162 < 0.05. So, hypothesis 2a **is accepted**.

### 3.2. Effect of Investor Sentiment (VXEEM) on Herding's behavior

The results of the study that tested investor sentiment (VXEEM) towards herding behavior are shown in the table below:

Table 6. Investor Sentiment Regression Test (VXEEM) Results on Herding Behavior

Variable	Coefficient	T Statistics	Probability
CSAD= $\alpha + \beta_1 \text{AbsRm} + \beta_2 \text{RM}^2 + \beta_3 \text{Rm}^2 * \text{VXEEM} + \varepsilon$			
C	0.014	73.16	0.0000
AbsRm	0.416	34.82	0.0000
Rm <sup>2</sup>	0.670	34.24	0.0000
dRm <sup>2</sup> *VXEEM	-0.003	-0.56	0.5735
R-squared			0.5300
Adjusted R-squared			0.5287
F Statistics			408.30
Probability			0.0000

Source: data processed EViews, 2022

The statistical F value is 408.3089, and the probability is 0.000000, based on the regression test results, indicating that the model above is fit and worthy of testing. The adjusted R<sup>2</sup> magnitude ranges from 0 to 1. Assume that the closer the adjusted value of R<sup>2</sup> is to one, the better the model's ability to explain dependent variables, and vice versa. Absolute market return squared market return and investor sentiment is the independent variables in this equation (VXEEM).

According to the value of adj R<sup>2</sup>, the independent variable, investor sentiment, has a 52.8% influence on the dependent variable, herding behavior. Hypothesis 2b is being tested to determine whether herding behavior is influenced by investor sentiment. As measured by VXEEM, investor sentiment has not been shown to influence herding behavior.

The probability value in the above equation is  $0.5735 > 0.05$ . As a result, the 2b hypothesis is rejected.

### 3.3. Investor Sentiment and Herding Behavior Moderated by Cultural Shocks.

The results of the study that tested cultural shocks to herding behavior are shown in the table below:

Table 7. Cultural Shocks and Herding Behavior

Variable	Coefficient	T Statistic	Probability
C	0.014	73.12	0.000
AbsRm	0.420	35.35	0.000
Rm <sup>2</sup>	0.668	35.30	0.000
dRm <sup>2</sup> *dcs_hm	-1238.766	-0.38	0.701
dRm <sup>2</sup> *dcs_ld	-3061.485	-6.91	0.000
dRm <sup>2</sup> *dcs_nn	-1808.095	-1.08	0.2784
R-squared			0.532
Adjusted R-squared			0.531
F Statistics			384.47
Probability			0.0000

Source: data processed EViews, 2022

Based on the results of the regression test, it is known that the statistical F value is 384.47, and the probability is 0.0000, which means that the model above is fit and worthy of testing. The magnitude of adjusted R<sup>2</sup> ranges from 0 to 1; if the adjusted value of R<sup>2</sup> gets closer to one, the better the model's ability to explain dependent variables and vice versa.

The value of adj R<sup>2</sup> is known to be 53%, which means that the variables of cultural shock (dcs\_hm, dcs\_ld and dcs\_nn) can affect the dependent variable, namely herding behavior, by 53%. The study's results above show that the level of probability or significance of 0.0000, worth below 0.05, is found in cultural shocks in the lockdown phase, which means that in this phase, investors feel a great cultural shock and increased herding behavior on the stock exchange. The table above shows that cultural shock variables directly affect herding behavior in the lockdown phase (dcs\_ld).

### 3.4. Investor Sentiment (VIX) and Herding Behavior Moderated by Cultural Shock in The Honeymoon Phase (dcs\_hm)

The results of the study that tested the influence of investor sentiment proxied with the VIX index on herding behavior moderated by cultural shocks in the honeymoon phase (dcs\_hm) are shown in the table below:

Table 8. Investor Sentiment (VIX) and Herding Behavior Moderated by Cultural Shocks in The Honeymoon Phase (dcs\_hm)

Variable	Coefficient	T Statistic	Probability
CSAD = $\alpha + \beta_1 \text{AbsRm} + \beta_2 \text{Rm}^2 + \beta_3 \text{Rm}^2 * \text{dcs\_hm} + \beta_4 \text{Rm}^2 * \text{VIX} * \text{dcs\_hm} +$			
C	0.014	73.16	0.000
AbsRm	0.418	35.19	0.000

H4a: Accepted

Variable	Coefficient	T Statistic	Probability
$Rm^2$	0.670	35.36	0.000
$dRm^2 * dcs\_hm$	1992.451	2.16	0.030
$dRm^2 * VIX * dcs\_hm$	-0.254	-3.25	0.0012
R-squared			0.537
Adjusted R-squared			0.536
F Statistics			394.95
Probability			0.0000

Source: data processed EViews, 2022

Based on the regression test results, the statistical F value is 394.95, and the probability is 0.0000, indicating that the model above is fit and worthy of testing. The magnitude of adjusted  $R^2$  ranges from 0 to 1; as the adjusted value of  $R^2$  approaches one, the model's ability to explain dependent variables improves, and vice versa.

The adj  $R^2$  value is 53.6%, indicating that the investor sentiment variable (VIX) and the cultural shock moderation variable (dcs hm) have a 53.6% influence on the dependent variable, namely herding behavior. According to the study's findings, the probability or significance level of  $dRm^2 * VIX * dcs\_hm$  of 0.0000 is less than 0.05 and has a negative value. It means that the cultural shock strengthens high investor sentiment towards the stock market felt during the honeymoon phase (the beginning of the pandemic) and will increase stock exchange herding behavior.

### 3.5. Investor Sentiment (VIX) and Herding Behavior Moderated by Cultural Shocks In Lockdown Phase (dcs\_Id)

The results of the study that tested the influence of investor sentiment proxied by the VIX index on herding behavior moderated by cultural shocks in the lockdown phase (dcs\_Id) are shown in the table below:

Table 9. Investor Sentiment (VIX) and Herding Behavior Moderated by Cultural Shaken in Lockdown Phase (dcs\_Id)

Variable	Coefficient	T Statistics	Probability
$CSAD = \alpha + \beta_1 AbsRm + \beta_2 Rm^2 + \beta_3 Rm^2 * dcs\_Id + \beta_4 Rm^2 * VIX * dcs\_Id + \varepsilon$			
C	0.014	73.24	0.000
AbsRm	0.419	35.41	0.000
$Rm^2$	0.669	35.41	0.000
$dRm^2 * dcs\_Id$	-3026,534	-6.76	0.000

H4b: Rejected

dRm <sup>2</sup> *VIX*dcs_Id	-0.020	-0.49	0.625
R-squared			0.532
Adjusted R-squared			0.531
F Statistics			397.69
Probability			0.0000

Source: data processed EViews, 2022

Based on the results of the regression test, it is known that the statistical F value is 397.69, and the probability is 0.0000, indicating that the model above is fit and worthy of testing. The adjusted R<sup>2</sup> magnitude ranges from 0 to 1. If the adjusted value of R<sup>2</sup> approaches one, the model's ability to explain dependent variables improves, and vice versa.

The value of adj R<sup>2</sup> is known to be 53%, which means that the investor sentiment variable (VIX) and the cultural shock moderation variable (dcs\_Id) can influence the dependent variable, namely herding behavior, by 53%. The results of the study above are known that the probability level or significance of dRm<sup>2</sup> \*VIX\*dcs\_Id of 0.625, which is worth above 0.05, which means that investor sentiment moderated by cultural shocks during the lockdown phase is not able to influence herding behavior. The 4b hypothesis is rejected.

### 3.6. Investor Sentiment (VIX) And Herding Behavior Moderated by Cultural Shocks in The New Normal Phase (dcs\_nn)

The results of the study that tested the influence of investor sentiment proxied by the VIX index on herding behavior moderated by cultural shocks in the new normal (dcs\_nn) phase are shown in the table below:

Table 10. Investor Sentiment (VIX) and Herding Behavior Moderated by Cultural Shocks in The New Normal Phase (dcs\_nn)

Variable	Coefficient	T Statistics	Probability
$CSAD = \alpha + \beta_1 AbsRm + \beta_2 Rm^2 + \beta_3 Rm^2 * dcs\_nn + \beta_4 Rm^2 * VIX * dcs\_nn + \epsilon$			
C	0.014	73.31	0.000
AbsRm	0.417	35.16	0.000
Rm <sup>2</sup>	0.672	35.47	0.000
dRm <sup>2</sup> *dcs_nn	-2177.485	-1.24	0.214
dRm <sup>2</sup> *VIX*dcs_nn	-0.252	-0.79	0.428
R-squared			0.530
Adjusted R-squared			0.528
F Statistics			394.29
Probability			0.0000

Source: data processed Eviews, 2022

Based on the results of the regression test, it is known that the statistical F value is 394.29, and the probability is 0.0000, which means that the model above is fit and worthy of

testing. The magnitude of adjusted  $R^2$  ranges from 0 to 1; if the adjusted value of  $R^2$  gets closer to one, the better the model's ability to explain dependent variables and vice versa.

The value of adj  $R^2$  is 52.8%, which means that the investor sentiment variable (VIX) and the cultural shock moderation variable (dcs\_nn) can influence the dependent variable, namely herding behavior, by 52.8%. The results of the study above are known that the probability level or significance of  $dRm^2 * VIX * dcs\_nn$  of 0.428, which is worth above 0.05, which means that investor sentiment moderated by cultural shocks during the new normal phase is not able to influence herding behavior. The 4c hypothesis is rejected.

### 3.7. Investor Sentiment (VXEEM) and Herding Behavior moderated by Honeymoon Phase Cultural Shock (dcs\_hm)

The results of the study that tested the influence of investor sentiment proxied with the VXEEM index on herding behavior moderated by cultural shocks in the honeymoon phase (dcs\_hm) are shown in the table below:

Table 11 Investor Sentiment (VXEEM) and Herding Behavior Moderated by Cultural Shocks In The Honeymoon Phase (dcs\_hm)

Variable	Coefficient	T Statistics	Probability	Conclusion
$CSAD = \alpha + \beta_1 AbsRm + \beta_2 Rm^2 + \beta_3 Rm^2 * dcs\_hm + \beta_4 Rm^2 * VXEEM * dcs\_hm + \epsilon$				
C	0.014	73.14	0.000	
AbsRm	0.418	35.19	0.000	
$Rm^2$	0.670	35.34	0.000	
$dRm^2 * dcs\_hm$	1716.435	1.98	0.047	
$dRm^2 * VXEEM * dcs\_hm$	-0.211	-3.20	0.001	H4d: Accepted
R-squared			0.530	
Adjusted R-squared			0.529	
F Statistics			394.93	
Probability			0.0000	

Source: data processed Eviews, 2022

Based on the results of the regression test, it is known that the statistical F value is 394.93, and the probability is 0.0000, which means that the model above is fit and worthy of testing. The magnitude of adjusted  $R^2$  ranges from 0 to 1; if the adjusted value of  $R^2$  gets closer to one, the better the model's ability to explain dependent variables and vice versa.

The value of adj  $R^2$  is 52.91%, which means that the investor sentiment variable (VXEEM) and the cultural shock moderation variable (dcs\_hm) can influence the dependent variable, namely herding behavior, by 52.91 %. The results of the study above are known that the probability or significance level of  $dRm^2 * VXEEM * dcs\_hm$  of 0.001, which is below 0.05 and negative value, which means that the cultural shock strengthens high investor sentiment towards the stock market felt during the honeymoon phase (the beginning of the pandemic) will increase herding behavior on the stock exchange.

The results of this study show that the variable of cultural shock in the honeymoon phase (dcs\_hm) is full moderation, which can moderate investor sentiment towards herding behavior. So, the 4d hypothesis is **accepted**.

### 3.8. Investor Sentiment (VXEEM) And Herding Behavior moderated by Lockdown Phase Cultural Shock (dcs\_Id)

The results of the study that tested the influence of investor sentiment proxied with the VXEEM index on herding behavior moderated by cultural shocks in the lockdown phase (dcs\_Id) are shown in the table below:

Table 12. Investor Sentiment (VXEEM) and Herding Behavior Moderated by Cultural Shocks In The Lockdown Phase (dcs\_Id)

Variable	Coefficient	T Statistics	Probability
CSAD = $\alpha + \beta_1 \text{AbsRm} + \beta_2 \text{Rm}^2 + \beta_3 \text{Rm}^2 * \text{dcs\_Id} + \beta_4 \text{Rm}^2 * \text{VXEEM} * \text{dcs\_Id} + \epsilon$ H4e: Rejected			
C	0.014	73.23	0.000
AbsRm	0.419	35.45	0.000
Rm <sup>2</sup>	0.669	35.39	0.000
dRm <sup>2</sup> *dcs_Id	-3066.535	-6.93	0.000
dRm <sup>2</sup> *VXEEM*dcs_Id	-0.032	-0.86	0.386
R-squared			0.532
Adjusted R-squared			0.530
F Statistics			397.73
Probability			0.0000

Source: Data processed, Eviews 2022

Based on the results of the regression test, it is known that the statistical F value is 397.73. Moreover, the probability is 0.0000, which means that the above model is fit and worthy of testing. The magnitude of adjusted R<sup>2</sup> ranges from 0 to 1; if the adjusted value of R<sup>2</sup> gets closer to one, the better the model's ability to explain dependent variables and vice versa.

The value of adj R<sup>2</sup> is known to be 53%, which means that the investor sentiment variable (VXEEM) and the cultural shock moderation variable (dcs\_Id) can influence the dependent variable, namely herding behavior, by 53%. The study's results above show that the probability or significance level of dRm<sup>2</sup> \*VXEEM\*dcs\_Id of 0.386 is worth above 0.05, which means that cultural shocks during the lockdown phase cannot strengthen or weaken the influence of investor sentiment on the occurrence of herding behavior on the stock exchange. So, the 4e hypothesis is **rejected**.

### 3.9. Investor Sentiment (VXEEM) And Herding Behavior moderated by Cultural Shocks (dcs\_nn)

The results of the study that tested the influence of investor sentiment proxied with the VXEEM index on herding behavior moderated by cultural shocks in the lockdown phase (dcs\_Id) are shown in the table below:

Table 13. Investor Sentiment (VXEEM) and Herding Behavior Moderated By Cultural Shocks In The New Normal Phase (dcs\_nn)

Variable	Coefficient	T Statistics	Probability
CSAD = $\alpha + \beta_1 \text{AbsRm} + \beta_2 \text{Rm}^2 + \beta_3 \text{Rm}^2 * \text{dcs\_nn} + \beta_4 \text{Rm}^2 * \text{VXEEM} * \text{dcs\_nn} + \epsilon$			
C	0.014	73.33	0.000
AbsRm	0.416	35.14	0.000

H4e:  
Rejected

Variable	Coefficient	T Statistics	Probability
$Rm^2$	0.672	35.50	0.000
$dRm^2*dc_s_$	-1087.784	-0.60	0.543
$dRm^2*VXEEM*dc_s_{nn}$	0.239	1.03	0.300
R-squared			0.530
Adjusted R-squared			0.528
F Statistics			394.32
Probability			0.0000

Source: Data processed, Eviews 2022

Based on the results of the regression test, it is known that the statistical F value is 394.32, and the probability is 0.0000, which means that the above model is fit and worthy of testing. The magnitude of adjusted  $R^2$  ranges from 0 to 1; if the adjusted value of  $R^2$  gets closer to one, the better the model's ability to explain dependent variables and vice versa.

The value of adj  $R^2$  is 52.87%, which means that the investor sentiment variable (VXEEM) and the cultural shock moderation variable ( $dc_s_{nn}$ ) can influence the dependent variable, namely herding behavior, by 52.87 %. The results of the study above are known that the probability or significance level of  $dRm^2 * VXEEM * dc_s_{nn}$  of 0.300, which is worth above 0.05, means that cultural shocks during the new normal phase, cannot strengthen or weaken the influence of investor sentiment on the occurrence of herding behavior on the stock exchange. So, the 4f hypothesis **is rejected**.

### 3.10. Discussion

#### 3.10.1. Herding's Behavior in Emerging Stock Markets

The test results demonstrated no herding behavior in emerging market stock markets around the world in a large sample size. According to Research, investors are not influenced to make investment decisions based on the decisions of most other investors in the market during a decline or increase in market value. Emerging stock market investors are more likely to be cautious in their investment decisions.

The stock market's investor behavior evolves, resulting in the presence of anti-herding. During times of low market pressure, anti-herding behavior implies the presence of a dispersion of returns. Market participants are likelier to focus on most of the information conveyed by price movements and make rational decisions. Most emerging market equity investors are more likely to choose not to follow the lead of other dominant investors.

The dispersion of returns during higher market pressures can be seen from the excessive investor confidence. Investors are likelier to choose stocks and time to invest on their own merits rather than overall market conditions. The results above show that the estimation of herding behavior in rising and falling markets shows that anti-herding occurs when the market is in rising and falling conditions. When market returns fall, investors tend to feel terrified and make decisions based on only a few groups of investors. Likewise, when market returns rise, investors also feel that investment decisions are made based on the opinions of some investors alone without following the majority group.

However, based on the results of rolling window regression tests conducted per 50 days of observation, the results of deeper Research on the existence of herding behavior were obtained. Herding behavior exists throughout the observation period, from the end of 2019 to June 30, 2021. Some of the world stock markets such as South Africa, Mexico, Czech, Saudi Arabia, Egypt, Peru, Greece, United Arab Emirates, Turkey, Thailand, Taiwan, Russia, Qatar, Poland, Pakistan, Malaysia, Colombia, Indonesia, India, China, Philippines,

Brazil and Chile. The results of this study indicate that herding behavior occurs in most sample countries.

This study's results align with the Research of Bowe and Domuta (2004), which states that investors tend to do anti-herding when a crisis occurs in the stock market. Lee (2017) also said that anti-herding behavior occurs in the American stock market, where investors are unaffected by negative or positive stock price movements. Galarotis, Krikida and Spyrou (2016) also found no herding behavior during the economic crisis. Bui, Nguyen, and Nguyen (2015) reinforce the results of this study that in the stock market in Asia, namely the Philippine stock market, there is also anti-herding behavior during the economic crisis. Finally, Tsuchiya (2021) stated that there was also anti-herding behavior during the global financial crisis in the Japanese stock market.

This study provides a different view from previous studies by using a sample of all research results confirming prospect theory that explains investor behavior in several markets in Asia, parts of America, and Europe. Investors tend to be cautious in making decisions in the stock market during the Covid 19 pandemic. Prospect theory explains that investors can behave differently depending on the consequences they get. Investors can take risk aversion when faced with profits and take risks when faced with losses. This study's results explain that investors tend to take risks based on rational thinking in a state of loss.

### **3.10.2. The Effect of Investor Sentiment on Herding's Behavior**

Investor sentiment proxied with the VIX influenced herding behavior in this study. It is evident that the higher value of the VIX index, which indicates that investors are pessimistic about market performance, can improve the herding behavior of investors on the stock exchange. Investor sentiment proxied by the VIX index can explain that pessimistic investors can make investors act irrationally and engage in herding behavior. However, in contrast to sentiment measurements using the VXEEM index, the results show that investor sentiment measured by VXEEM cannot influence investors to behave herding.

A stock market that continues to rise or fall can be low volatile. However, a drastically rising and falling market indicates high volatility. The VIX index, which is above 20, indicates a growing fear. Investors tend to be pessimistic or optimistic about the state of the market. The results of this study show that the average value of the VIX is above 20, which means that the stock market is developing in a state of panic and stress in the face of the Covid-19 pandemic. Panicked investors can tend to be pessimistic and end up herding behavior.

This study's results align with Aharon (2020), which states that herding behavior is determined by investor sentiment in the market. Sun, Bao, and Lu (2021) emphasize that what can shape sentiment in the market is more the presence of institutional investors than individual investors. Aharon (2020) added that in addition to institutional and individual investors, there are other market participants. Zouaoui (2011) also stated that investor sentiment could increase during a crisis in the stock market compared to a quiet period.

This Research does not specialize in institutional or individual investors but specializes in the movements of the VIX and VXEEM indices formed from the perceptions of the two investors. Furthermore, Vuong and Suzuki (2020) say that investor sentiment can shape the value of market returns that influence investors' investment behavior. A positive market return indicates that investor sentiment can steer stock returns in a positive direction and shape herding behavior on stock exchanges in emerging markets. This study proves a herding behavior in the emerging stock market during the Covid-19 pandemic.

The results of this study confirm the prospect theory of Kahneman and Tversky (1979), who said that people with irrational tendencies are capable of risking gains rather than losses. When irrational investors are in a profit position, they tend to avoid risk and if the losing position can face the risk. Investors in emerging stock markets tend to be

pessimistic about market conditions, so they can make irrational decisions based on information they obtain from other investors and herd.

Based on the results of sensitivity tests with rolling window regression, it is known that there is a herding behavior in most countries summarized in emerging stock markets. Investor sentiment has proven to influence herding behavior during the Covid-19 pandemic. The sensitivity results explained that both sentiments measured by VIX and VXEEM could influence herding behavior in Argentina, Brazil, Chile, China, India, Indonesia, Malaysia, and Pakistan. The results of this sensitivity test add to the results of an even more comprehensive study by identifying the occurrence of herding behavior every 50 days of observation.

### **3.10.3. The Effect of Investor Sentiment on Herding Behavior Moderated By Cultural Shocks**

This Research proves that the cultural shock felt by investors can strengthen investor sentiment in the stock market in a pessimistic direction and encourage investors to behave herding. Cultural shock is a powerful process of transforming and adjusting to the surrounding circumstances (Cupsa, 2018). The Research found that the cultural shock investors felt towards new cultures during the pandemic influenced herding behavior.

The cultural shock is divided into 4 phases, namely the honeymoon period, the phase at the beginning of the outbreak of the COVID-19 virus around the world, which occurred at the end of 2019 until the end of March 2020, proven to affect investor behavior in making investment decisions. Investors tend to herd in this phase with decision-making based on the opinions of some investors.

Investors felt the strongest cultural shock across emerging stock markets during the honeymoon phase. The different honeymoon periods between countries lead investors to restrictions on activities and socialization movements. This condition makes investors stressed and feels shaken, forcing investors to adapt to changes quickly. This condition leads to the decision of investors to invest in the capital market. The more investors in the stock market feel shaken in the honeymoon phase making, their pessimistic sentiment towards the market and directing their behavior in an irrational direction with herding behavior.

Cultural shocks during lockdowns, new normals, and integration periods have not proven to strengthen or weaken investor sentiment towards herding behavior. This Research proves that investors are more shaken when investors enter the early phases of the covid 19 pandemic and the delta covid 19 outbreaks in each country, as seen from the covid case reports provided by the WHO and Oxford websites. Repeated honeymoons cause the public and investors to feel shaken and get used to adapting to the changes in habits that have existed so far. Investors' despair at this pandemic situation and conditions gave rise to investors' pessimistic sentiment towards the state of the stock market.

This Research is supported by the Research of Cupsa (2018), which states that culture shock involves a powerful process of transformation that occurs at the level of individuals and societies. Individuals are required to be able to adapt to their environment immediately. This cultural shock is a new factor used in Research on herding behavior.

The results of this study confirm the theory of cultural shock (culture shock). A cultural shock is an anxiety that arises because of losing all the social signs and symbols that have been previously possessed. The covid 19 pandemic has caused tension due to the efforts made by individuals to adapt psychologically to new habits, feelings of loss of friends and family, rejection of new habits, confusion, over-rapid changes, anxiety, and anger at the situation that occurs. This cultural shock causes changes in investors' psychology that can lead to changes in investor behavior in investment decision-making. The results of this study add to the update in the explanation of herding behavior during the COVID-19 pandemic.

This study's results on sensitivity tests show that cultural shocks can generate negative sentiment for investors and cause investors to engage in herding behavior. It is known that investors are in countries such as Brazil, Chile, China, the Philippines, India, Indonesia, Pakistan, the United Emirates, Saudi Arabia, Colombia, Russia, Thailand, Greece, Hungary, the Czech Republic, and Mexico. Those were carried out herding behavior in the early phases of the pandemic at the end of 2019 and the beginning of the outbreak of the delta covid virus in early 2021. Herding behavior also occurred in the lockdown phase in early 2020 and the first quarter of 2021 in the following countries: Qatar and Taiwan. Thus, in detail, not all investors in emerging stock market countries engage in herding behavior.

#### 4. CONCLUSION

This study provides insight into financial behavior, particularly herding behavior. The results demonstrate that investors in emerging stock markets are more likely to engage in anti-herding behavior in decision-making during the Covid-19 outbreak. Additional evidence indicates that investor mood, as assessed by the VIX and VXEM indices, promotes herding behavior on emerging stock markets. Future study employing elements from cultural psychology theory has demonstrated that in the earliest stages of catching the Covid-19 virus, there is a worldwide distribution. Investors felt a jolt, which bolstered investor enthusiasm toward the stock market and eventually induced herding behavior.

This study contributes to the literature on financial behavior and provides new insights into the psychological state of investors based on the rise or fall of 19 covid instances. This study's findings also suggest that investors and market regulators should be able to govern the capital market during a crisis so that investor sentiment does not induce bias. This study's measurement of culture shock is limited by the inclusion of dummy variables; to obtain more comprehensive results, alternative psychological theories and samples from established capital markets should be incorporated.

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