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Herding and equity market liquidity in emerging market. Evidence from Vietnam☆

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HIGHLIGHTS

- We investigate the link between herding and stock market liquidity.
- We confirm that herd exists in Vietnam stock market.
- The study reveal significant evidence of herding asymmetry conditional on the average market liquidity.

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ABSTRACT

This paper focuses on investigating the relation between herding and liquidity in Vietnam stock market, an issue which captures less intention in the current literature. We use daily prices and daily trading volume of all stocks traded on the Ho Chi Minh City stock exchange over 13 years. The finding confirms the existence of herd propensity in Vietnam equity market during the period studied. More importantly, the results reveal significant evidence of herding asymmetry conditional on the average market liquidity. The herd behavior is more pronounced for high and medium liquidity stocks. Furthermore, we find anecdotal evidence supporting the bilateral effects between herding and market liquidity.

1. Introduction

Herding in financial market has become more and more prevalent in the modern financial literature, which attracts increasing attention from academics resulting in tremendous volume of articles in existing literature. The recent 2008 financial meltdown also highlights the importance of further understanding of this phenomenon in equity markets. Despite an enormous effort in exploring this issue, classical financial theories are unsuccessful in explaining the asset price movement during extreme volatile periods. To fill this knowledge gap, a number of researchers suggest alternative explanations based on the perspectives of behavioral finance.

Herding can be defined as the process in which investors make decisions in a similar direction, mimic the actions of others, or as the convergence to the average (Nofsinger and Sias, 1999; Welch, 2000; Hirshleifer and Teoh, 2003). In other words, herding reflects the similarity in making investment decisions (Clement et al., 2017). In the presence of herding, stock prices tend to deviate further from its intrinsic value, resulting in the inappropriate price (Dang and Lin, 2016). As a consequence, this intentional imitation will cause market fragility, excess volatility and systematic risk (Bikhchandani and Sharma, 2001).

Liquidity is one of important fundamentals of financial markets (Ma et al., 2018) and Rosch and Kaserer (2013) claim that there is a positive relationship between stock market and liquidity risk. Particularly, they indicate that the market liquidity declines when the equity market decreases and the positive relation is especially apparent during financial market turmoil.

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Previous researchers argue that the reduction of liquidity in the market induces the 2008 global financial crisis (Nagel, 2012; Rosch and Kaserer, 2013; Ma et al., 2018). Furthermore, emerging markets are considered as low liquidity compared to advanced markets (Fong et al., 2017). Therefore, liquidity is a very important indicator which attracts attention from market participants, regulators and academics (Ma et al., 2018) within the framework of emerging markets in general and in Vietnam stock market in particular.

This paper identifies the herding phenomenon within the framework of an emerging market. This work is built on previous herding studies. However, this paper markedly differs from other earlier articles in emerging markets in the respect that we consider the issue in Vietnam stock market, which has been becoming an important frontier market in Asia recently. More radically, we highlight the relation between herding and equity market liquidity in this emerging market. We also partition the full data sample into before, during and after the 2008 global financial crisis period to intensively clarify the issue. Further, we analyze whether herding generates liquidity or liquidity contributes to fueling herding by employing Granger Causality test. In this paper, we employ the prominent Amihud (2002) illiquidity measure and modified by Krolyi et al. (2012) to estimate the average market liquidity. Our data set ranges from January 2005 to July 2017 with a large number of firms traded on the Ho Chi Minh City stock exchange.

We are motivated in several different ways. Firstly, we consider the impact of herd behavior on stock market when it exists. When herding occurs, investors' trading behaviors have propensity to move towards the market consensus which result in the divergence between the stock prices and their underlying values. If herding persists longer and the stock prices depart from the intrinsic values, it results in the inefficiency and instability or even the failure of financial system (Vo and Phan, 2016, 2017). Therefore, a clear understanding of herd behavior is important not only to different stakeholders in portfolio investment and risk management but also important to policy makers in maintaining market stability and efficiency (Vo and Phan, 2016, 2017).

The feature of information asymmetry in the context of emerging markets is our second motivation for this paper. Several published papers concern the exhibition of herding in developed markets while the literature examining this propensity in emerging markets remains light. However, herding is argued to highly probably occur in developing countries where investors are less experienced and the transparency of information flow is limited. Moreover, the importance of emerging stock markets gradually increases which induces the need for further examination in these markets. Therefore, further studies analyzing herding within the scope of emerging markets is crucial.

Another important motivation arises from the radical impact of liquidity on herding in equity market. A growing amount of current literature suggests that liquidity could be used to forecast stock returns in both firm level and market level. Indeed, Amihud (2002) asserts that the movement in liquidity is an important indicator to forecast the aggregate returns. Liquidity is commonly referred to as the market sentiment indicator (Baker and Stein, 2004). An abnormal liquid market indicates that the stock price is created by irrational investors. In particular, market with high level of liquidity denotes the positive sentiment of these irrational investors which can be the basis of herding in the following period. On the other hand, BenSaida et al. (2015a) argue that investors following the action of others are intensifying the trading of particular stocks; thus, leading to unusually high liquidity level. Hence, market liquidity is likely to be a vital factor to fuel herding movement and contributes to explaining herding propensity in equity market. This motivates us to add liquidity to the herding model to investigate the effect of this factor on another factor.

In this article, our predominant contribution to the extant financial literature is to bridge the gap about how liquidity influences herd behavior in Vietnam equity market. Our paper, to the extent of our knowledge, is one of a few studies examining this relation within the framework of emerging markets. A number of related studies confirm that herd behavior exists in Vietnam stock market. For example, Vo and Phan (2016) analyze herd behavior under different market conditions. Vo and Phan (2017) investigate the possible linkage between two variables in Vietnam stock market, in which trading volume is a proxy of liquidity. This study compares trading volume at a specific day with the previous 30-day average movement to define the level of liquidity. The authors then examine the existence of herding in respect of high and low trading volume. Vo and Phan (2019) analyze the impact of idiosyncratic volatility on herding behavior and show that herd behavior displays distinct patterns conditional on different level of idiosyncratic volatility. In this paper, we differentiate from previous ones by utilizing different measure of liquidity based on the well-known illiquidity measure of Amihud (2002) and modified measure by Krolyi et al. (2012). More importantly, this paper advances previous studies in the sense that the approach allows us to explore the impact of liquidity on herding not only in the highest and lowest distribution but also in the medium level of liquidity.

Our second contribution is to elucidate whether liquidity generates herding and vice-versa. In this sense, we utilize Granger causality test to clarify the two-directional relation between two variables. By doing so, we provide a comprehensive investigation of the relationship between liquidity and the movement of stock returns based on the behavioral finance perspective. Our paper is amongst the very first which examine this relation when it comes to detecting the effect of liquidity on herd behavior in the context of Vietnam.

The remainder of the paper is structured as follows. Section 2 reviews some previous studies linking herding and market liquidity. Section 3 provides the data collection and research methodology to obtain the objectives. Section 4 presents our regression results and Section 5 summaries some main points to conclude the paper.

2. Literature review

Market liquidity is defined as the tradability of the asset (i.e. the large volume of the asset which is traded rapidly at a plausible price level) (Sarr and Lybek, 2002) or marketability to expedite the purchase and sales of an asset without considerably influencing its price (Han et al., 2016). Previous studies assert that liquidity is measured by some other proxies rather than observed directly. In an influential paper, Amihud and Mendelson (1986) indicate the bid–ask spread and transaction cost are two most prevalent liquidity measures in empirical research. However, some authors argue the data on the bid–ask spread and trading cost are difficult to collect and even untrustworthy in international setting. Trading volume and turnover ratio; therefore, have been widely utilized as alternatives to measure market liquidity in financial literature (Levine and Schmukler, 2006).

Trading volume as a liquidity indicator plays an integral part in the process of forming price and in evaluating stock performance. Previous anecdotal evidence indicates that this proxy represents the quality and the accuracy of information flow; thus, contains the messages about the price movement (Blume et al., 1994). In the case that herd occurs, the stock prices will deviate further from the equilibrium and move toward the market average, resulting in high trading volume (Bensaida, 2017). Therefore, this paper asserts the definite relation between herding and trading volume.

Numerous studies discuss the impact of trading volume on herd behavior. A very first empirical research taking into account the potential effect of trading volume on herding is introduced by Lakonishok et al. (1992). This work proposes a model to analyze the relation between herding and stock prices using degree of holdings by money managers of 769 tax-exempt funds in the US. The authors finally conclude that herding exists with weak signal for smaller stocks while they find relatively little of herding in the group of largest stocks, which account for the mass of most institutional holding and trading. With the similar context of the US equity market, Bensaida et al. (2015b) focus on detecting the display of herding and the linkage between it and trading volume. By adding the dummy variables representing abnormal high and low trading days (top 10th percentile and bottom 10th percentile, respectively), the authors reveal that the US financial market exhibits herding both on days with high and low trading volume. Nevertheless, the herding asymmetry has not been captured strongly, which reveals the negligible impact of the changes in market liquidity on the market return dispersion. By applying Granger Causality test, Bensaida et al. (2015b) find significant bilateral relationship between herding and trading volume. Particularly, trading volume triggers herding and vice versa, herding contributes to intensifying trading. Litimi et al. (2016) focus on examining how trading volume potentially effects herding in various US sectors rather than in overall stock market. By employing CSSD model, the results indicate that trading volume generates herding in only three out of 12 sectors analyzed. Litimi et al. (2016) modify CSAD model by including trading volume as an independent variable to detect herding in different sectors. The findings show that trading volume triggers herding movement in five sectors and in the whole US stock market. Recently, Bensaida (2017) assert that trading volume could be an essential factor to fuel herding. Using analogous method as Litimi et al. (2016), the author provides empirical evidence that volume turnover does not enhance herding propensity, regardless of during turbulent or placid periods.

Galariotis et al. (2016) provide new insight into the link between the phenomenon and market liquidity in a sample of five stock markets consisting of Germany, France, Japan, the UK and the US from 2000 to 2015. The authors find no evidence of herding in any markets for the full data sample. When conditional on the liquidity of stocks; however, the results provide herding evidence for stocks with high level of liquidity in the five analyzed countries and for most of sub-periods (except for Germany). Lao and Singh (2011) and Fu and Lin (2010) investigate the presence of herding propensity in Chinese stock market employing the cross-sectional standard deviation (CSSD) by Christie and Huang (1995). They conclude that trading volume induces herding.

Several papers suggest that trading volume intensifies herding; nevertheless, the anecdotal evidence indicating how trading volume influences herding is mixed. Tan et al. (2008) examine the exhibition of herd behavior in Chinese equity market and its asymmetric effect with regards to market return, trading volume and return volatility. The results reveal that domestic investors tend to herd during high trading day while foreign institutions are unrelated to trading volume since they form trading decision based on common source of information despite the consensus of market activity. On the contrary, Fu and Lin (2010) employ six measures of testing herding and find no anecdotal evidence of this propensity in Chinese stock market. Moreover, the findings support that low turnover stocks (traded volume/total shares) are more likely to herd than high turnover stocks. Vo and Phan (2017) conclude the same result when investigating the herding asymmetry in terms of trading volume in Vietnam stock market. Utilizing the herding measure developed by Chang et al. (2000), they report the prevalence of herding on low trading days rather than in the high volume state.

Table 1
Summary of the sample in each year.

Estimated years	Number of firms in our sample	Number of daily observations of closing prices
2005	23	4 618
2006	82	7 768
2007	109	21 774
2008	131	29 784
2009	175	35 952
2010	243	52 587
2011	269	60 332
2012	278	63 763
2013	281	64 102
2014	290	66 199
2015	312	68 706
2016	324	72 489
July 2017	331	31 906

Note: The sample includes the number of non-financial firms and daily observations of adjusted closing prices of listed firms on the Ho Chi Minh City stock exchange (HOSE) collected from the official website of HSX. The data set in our sample ranges from January 2005 to July 2017.

3. Data and methodology

3.1. Data collection

For empirical analysis, the data comprise both firm-specific data and market data including daily stock prices and trading volume of all firms traded on the Ho Chi Minh City stock exchange (HOSE). The VN-Index is used as the proxy for market indicator to estimate market returns. The number of firms and daily observations of closing prices in specific years are summarized in Table 1. The final sample yields totally 3029 daily observations of return dispersions which are measured by CSAD method covering the period from 2005 to July 2017.

In order to examine how global meltdown influences the relation between herding and stock liquidity, we partition the sample into three sub-periods. More specially, we include the following periods: before crisis (BC) period (from 2005 to June 2007), during global downturn (FC) (from July 2007 to 2008) and after crisis (AC) period (from 2009 to February 17, 2017) with the corresponding number of observations is 624, 378 and 2030, respectively.

3.2. Detecting herding

In this paper, we employ the well-known cross-sectional absolute deviation method (CSAD) of Chang et al. (2000) to examine herding phenomenon in our equity market. As herding exits, individual investors tend to conform to the market consensus, which leads to the decrease in stock dispersions from the market return. Following the approach of CSAD, the return dispersion is defined as follows:

$$CSAD_t = \frac{1}{N}\sum_{i=1}^{N}\left|R_{i,t} - R_{m,t}\right| \quad (1)$$

where $R_{m,t}$ is the equally weighted average returns at time t and $R_{i,t}$ is the return of individual stock i at time t. The return for each stock at time t is computed as $R_{i,t} = 100 \times (\ln(P_t) - \ln(P_{t-1}))$, where P_t and P_{t-1} are the adjusted closing price at time t and t-1, respectively.

We use the following specification to analyze and detect herding propensity:

$$CSAD_t = \gamma_0 + \gamma_1\left|R_{m,t}\right| + \gamma_2 R_{m,t}^2 + \varepsilon_t \quad (2)$$

Under asset pricing model theory, the relationship between $|R_{m,t}|$ and $CSAD_t$ is linear, generating a statistically significant and positive coefficient γ_1 in Eq (2). In the case that herding coefficient γ_2 is significant different from zero, there are two potential cases to occur. In the first case, γ_2 is significant positive which means investors raise individuality in making trading decisions; thus, they do not cluster around the market consensus. In the second situation, the coefficient of the quadratic term is significant negative and this indicates the existence of herd behavior. This argument is in line with the conclusion of Chang et al. (2000) to define herding, which states that during periods of relatively large changes in price, $CSAD_t$ will be disproportionately reduced (decreases or increases with a decreasing rate).

3.3. Liquidity measure

As discussed in previous section, there are various measures to capture different aspect of liquidity depending on its dimensions. Sarr and Lybek (2002) argue that a liquid market tends to display the following characteristics: (i) immediacy which represents how quick an order is executed and settled; (ii) tightness which refers to the transaction costs; (iii) resiliency which is corresponding to the order flow; (iv) breadth which means numerous and large volume of order with minimal impact on prices; and (v) depth which is related to the wide range of order both above or below the price level being traded. Based on that, Sarr and Lybek (2002) group the liquidity measures into four categories which are based on transaction cost, trading volume, equilibrium price and market impact. Each single approach captures some specific liquidity dimensions. In addition, liquidity measures can be divided broadly including direct and indirect measures (Houweling et al., 2005). The former bases on transaction data (trading volume data) and the latter relies on particular asset characteristics (the quoted bid–ask spread).

In this study, we use the liquidity measure by Krolyi et al. (2012) which is modified from a well-known illiquidity method proposed by Amihud (2002). The approach bases on trading volume to measure the sensitivity of price in response to the number of stocks traded. The specification to measure liquidity is as follows:

$$Liq_{i,t} = -log\left(1 + \left(\frac{|R_{i,t}|}{P_{i,t}VO_{i,t}}\right)\right) \quad (3)$$

$$Liq_{m,t} = \frac{1}{N}\sum_{i=1}^{N} Liq_{i,t} \quad (4)$$

where $R_{i,t}$ is the individual return of stock i at time t; $P_{i,t}$ is the adjusted closing price of stock i at time t; $VO_{i,t}$ is the trading volume of stock i at time t; and $Liq_{m,t}$ is the average liquidity across stock at time t.

In order to investigate the relation between herding and market liquidity, we apply the following form:

$$CSAD_t = \gamma_0 + \gamma_1 |R_{m,t}| + \gamma_2 R_{m,t}^2 + D_1\gamma_3 R_{m,t}^2 + D_2\gamma_4 R_{m,t}^2 + \varepsilon_t \quad (5)$$

where D_1 and D_2 are the dummy variables taking the unity value if market liquidity lies in the 25% upper tail and the 25% lower tail of the distribution curve, respectively and zero otherwise. The coefficient γ_2 reveals the presence herding if liquidity lies on the distribution which is not covered by D_1 and D_2.

4. Empirical results

4.1. Descriptive statistics

Table 2 reports descriptive statistics analysis for the market returns (R_m) and cross-sectional absolute deviation (CSAD) for the whole sample covering the period 2005–2017.

Table 2
Descriptive statistics.

	Min	Median	Max	Mean	Standard deviation	Obs.
$R_{m,t}$	−6.0512	0.0359	7.7414	0.0358	1.5088	3029
$CSAD_t$	0.0924	1.9155	5.9485	1.8581	0.6166	3028

Note: This table shows summary statistics of the market return ($R_{m,t}$) and cross-sectional absolute deviation ($CSAD_t$). The sample comprises 3028 daily observations of CSAD representing all firms traded on the Ho Chi Minh City stock exchange. The research period covers from January 2005 to July 2017. The descriptive statistics include min, max, median, mean, standard deviation and the number of observation of the key variables.

Table 2 shows an overview of Vietnam stock market during the period studied. The statistics report the daily average return is approximately 0.04% ranging from −6.05% to 7.74%. Moreover, the standard deviation of market proxy is 1.51% implying the high magnitude of volatility, which is one of characteristics of emerging equity market. Table 1 also provides description of CSAD series. The daily average CSAD ranges from 0.09% to 5.95% with the standard deviation of 0.62%. This indicates the dispersion has a lower bound, which means individual returns tend to harmonized with the market consensus. In line with previous studies, the descriptive summary preliminarily reveals that investors are likely to disregard their own information and duplicate the actions of other market participants; which show potential display of herd behavior in Vietnam stock market (Vo and Phan, 2016, 2017).

4.2. Regression results

Table 3 provides estimated results from Eq. (2) for the full sample and three sub-samples with respect to the presence of herding in Ho Chi Minh City stock exchange.

Each column reports the estimated coefficients and t-statistic values of the linear and non-linear terms in the whole period and each sub-period. The herding coefficients γ_2 during four sample analyzed are all negative and statistically significant. This result reveals that the stock return dispersion is disproportionately reduced in comparison with what argued by asset pricing model. Although the absolute value of γ_2 during crisis period is quite small indicating weak herding, we find empirical evidence supporting the display of herd behavior in Vietnam stock market. This result is consistent with the conclusion regarding the existence of this phenomenon in the context of this equity market (Vo and Phan, 2016, 2017).

We continue to investigate herding conditional on the market liquidity. The regression results are showed in Table 4. The results are very different among the full sample and each sub-sample analyzed. Under condition of medium market liquidity, most of herding coefficients yield statistical negative values except for the estimates during the crisis period, which indicate the presence of herd behavior. However, the results are different over different periods in case of high and low market liquidity.

For the whole period, we find no evidence on the existence of herding when liquidity is in both high and low levels. Moreover, the significantly positive coefficient γ_4 implies investors increase individuality in making their trading decisions (Galariotis et al., 2016) instead of following the actions of others. During pre-crisis period, the coefficient γ_3 is significantly negative, indicating the dispersion decreases, which is consistent with the definition of herding. In other words, individual stocks tend to move towards the market consensus when the liquidity is high. Whereas, there is no evidence support the disclosure of this phenomenon under the condition during post-crisis period. Herding propensity; in contrast, displays when liquidity lies in the lower tail of the distribution over the period after global downturn.

Table 3
Herding in Vietnam stock market over the 2005–2017 period.

Variables	Full sample		Pre-crisis		Crisis		Post-crisis	
	Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat
γ_1	0.437***	3.88	0.777***	11.2	0.066	0.63	0.384***	16.78
γ_2	−0.101***	−3.00	−0.111***	−6.94	−0.048**	−2.10	−0.103***	−16.62
Adjusted R-squared	0.071		0.257		0.062		0.124	
F-statistics	115.92		108.40		13.46		144.78	
Probability	0.00		0.00		0.00		0.00	

Note: This table provides the estimation results of the equation $CSAD_t = \gamma_0 + \gamma_1 \left|R_{m,t}\right| + \gamma_2 R^2_{m,t} + \varepsilon_t$ in which $CSAD_t$ is the cross-sectional absolute deviation to measure returns dispersions at time t, $R_{m,t}$ is the market returns at time t. The full sample is from 2005 to 2017. The BC period is from January 2005 to June 2007, the FC period is between July 2007 and December 2008, and the AC period is between January 2009 and July 2017.
**Symbol denote statistical significance at the 5% level.
***Symbol denote statistical significance at the 1% level.

Table 4
Herding and market liquidity.

	Full sample			Pre-crisis			Crisis			Post-crisis		
	γ_2	γ_3	γ_4	γ_2	γ_3	γ_4	γ_2	γ_3	γ_4	γ_2	γ_3	γ_4
Coefficient	−0.11***	0.01	0.04***	−0.09***	−0.08***	0.01	−0.01	−0.03***	0.03	−0.07***	−0.01	−0.05***
t-statistics	−16.02	1.55	8.37	−5.45	−5.43	1.34	−0.75	−3.18	0.96	−11.42	−1.46	−10.64
Adjusted R-squared		0.09			0.30			0.10			0.17	
F-statistics		76.96			65.88			9.905			106.66	
Probability		0.00			0.00			0.00			0.00	

Note: This table indicates the regression results of the equation $CSAD_t = \gamma_0 + \gamma_1 \left|R_{m,t}\right| + \gamma_2 R^2_{m,t} + D_1\gamma_3 R^2_{m,t} + D_2\gamma_4 R^2_{m,t} + \varepsilon_t$ in which $CSAD_t$ is the cross-sectional absolute deviation of returns at time t, $R_{m,t}$ is the market returns at time t. D_1 and D_2 are the dummy variable taking the unity value if liquidity lies in the 25% upper tail and the 25% lower tail of the distribution, respectively and zero otherwise. The coefficient γ_2 represents herding in case liquidity lies on the distribution which is not covered by D_1 and D_2. To measure liquidity, we employ the following specification: $Liq_{i,t} = -log\left(1 + \left(\frac{|R_{i,t}|}{P_{i,t}VO_{i,t}}\right)\right)$ where $R_{i,t}$, $P_{i,t}$ and $VO_{i,t}$ is the stock return, closing price and trading volume of stock i at time t, respectively. The average liquidity is computed as $Liq_{m,t} = \frac{1}{N}\sum_{i=1}^{N} Liq_{i,t}$.
***Symbol denotes statistical significance at the 1% level.

During global financial meltdown with high volatility in stock prices, the results provide no empirical evidence of herding under conditions of low and medium market liquidity. However, when liquidity increases, the estimated coefficient $\boldsymbol{\gamma}_3$ is significantly negative. This reflects the fact that investors tend to move towards the market mean when market liquidity is in high level. Sarr and Lybek (2002) define the concept of high market liquidity which is the large volume of the asset traded in the market can be disposed of quickly at a reasonable price. This means market liquidity is considered as high level when trading volume of the asset is high. Bensaida (2017) claims that trading volume is generated under high volatility. On the other hand, if trading behaviors cluster around the market consensus, the stock prices will deviate further from the equilibrium, which lead to high trading volume; thus, high volatility. In other words, the correlation between herding, trading volume and volatility is apparent and direct (Bensaida, 2017).

In conclusion, there is empirical evidence regarding the display of herding phenomenon in Vietnam stock market covering the period analyzed. Moreover, the findings also report herding conditional on high, medium and low market liquidity.

4.3. Granger causality tests

We further investigate the two-way directional relationship between return dispersion (measured by CSAD) and liquidity using Granger Causality test. Table 5 reports the *p*-value from the test with the chosen two lags based on the Akaike information criterion. The test clarifies whether one factor contains information about the other factor by investigating how much Liquidity (CSAD) contributes to explaining CSAD (Liquidity) with the default null hypothesis is each factor in the test does not Granger cause the other. It is noticed that this investigation does not imply this variable is the effect of the other.

Table 5
Granger causality result between return dispersions (CSAD) and market liquidity (Liq).

	Pre-crisis	Crisis	Post-crisis
Liq does not cause CSAD	0.0003	0.5972	0.0047
CSAD does not cause Liq	0.0005	0.3857	0.0152

Note: This table presents the results from Granger Causality tests with the lags of two.

With the exception of crisis period, the p-values rejecting the null hypotheses indicate that the change in return dispersion contains information about the change in average market liquidity, vice versa. In other words, there is a bilateral effect between return dispersion (CSAD) and market liquidity (Liq) both before and after crisis periods. Our finding is in line with the conclusion mentioned in earlier sub-sections, which indicates a two-way relation between return dispersion measured by CSAD and market liquidity.

5. Conclusions and implications

The paper investigates the presence of herding in Vietnam equity market over the entire period 2005–2017 and each subperiods comprising before, during and after global downturn periods. More specially, we focus on the interrelationship between herd propensity and market liquidity. In particular, we detect the exhibition of herding within various market liquidity conditions including high, low and medium liquidity. We further investigate the two-way directional relation between return dispersion measured by CSAD and the average market liquidity. We employ herding approach evolved by Chang et al. (2000) and a modification form of illiquidity measure by Amihud (2002) to measure liquidity by adding dummy variables to the herding model.

The results indicate that we find empirical evidence of the display of herd behavior over the whole periods and each sub-period analyzed. When conditioning on market liquidity, we detect significant anecdotal evidence of herding for medium market liquidity condition for the whole sample and most of sub-periods. For high and low liquidity conditions, the results are somewhat different depending on specific periods. Applying Granger Causality, we find a two-way directional relation between return dispersion and average market liquidity in the context of Vietnam stock market.

The findings of this paper reveal some important investment and policy implications in terms of public information. Public information disclosure has proposed as the foundation of financial regulations (Han et al., 2016). Without credible information source, investors tend to imitate the market consensus as a basic for their investment decisions. The paucity of reliable and timely public information reduces market liquidity and increases information asymmetry; thus, declining information transparency which leads to the prevalence of herding in equity markets. In terms of investment, market participants should have strong concern in selecting and analyzing public information for optimal trading strategies instead of following others blindly. In term of policy, policy makers should be aware of public information and information transparency as an important point in the restructuring program in Vietnam stock market.

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References

Amihud, Y., 2002. Illiquidity and stock returns: Time series and cross-section effects. J. Financial Mark. 5, 31–56.
Amihud, Y., Mendelson, H., 1986. Asset pricing and the bid–ask spread. J. Financ. Econ. 17, 223–249.
Baker, M., Stein, J.C., 2004. Market liquidity as a sentiment indication. J. Financial Mark. 7, 271–299.
Bensaida, A., 2017. Herding effect on idiosyncratic volatility in us industries. Finance Res. Lett. 23 (November 2017), 121–132.
BenSaida, A., Jlassi, M., Litimi, H., 2015a. Volume-herding interaction in the american market. Amer. J. Financ. Account. 4 (1), 50–68.
Bensaida, A., Jlassi, M., Litimi, H., 2015b. Volume-herding interaction in the american market. Amer. J. Financ. Account. 4 (1), 50–68.
Bikhchandani, S., Sharma, S., 2001. Herd behavior in financial market. IMF Staff Pap. 47 (3), 279–310.
Blume, L., Easley, D., O'hara, M., 1994. Market statistics and technical analysis: The role of volume. J. Financ. 49 (1), 153–181.
Chang, E.C., Cheng, J.W., Khorona, A., 2000. An examination of herd behavior in equity markets: An international perspective. J. Bank. Financ. 24 (10), 1651–1779.
Christie, W., Huang, R.D., 1995. Following the pied piper: Do individual returns herd around the market?. Financ. Anal. J. 51 (4), 31–37.
Clement, A., Hurn, S., Shi, S., 2017. An empirical investigation of herding in the us stock market. Econ. Model..
Dang, H.V., Lin, M., 2016. Herd mentality in the stock market: On the role of idiosyncratic participants with heterogenous information. Int. Rev. Financ. Anal. 48, 247–260.
Fong, K.Y., Holden, C.W., Trzcinka, C.A., 2017. What are the best liquidity proxies for global research?. Rev. Financ. 21 (5), 1355–1401.
Fu, T., Lin, M., 2010. Herding in china equity market. Int. J. Econ. Financ. 2 (2), 148–156.
Galariotis, E.C., Krokida, S.I., Spyrou, S.I., 2016. Herd behavior and equity market liquidity: Evidence from majors markets. Int. Rev. Financ. Anal. 48, 140–149.
Han, B., Tang, Y., Yang, L., 2016. Public information and uninformed trading: Implications for market liquidity and price efficiency. J. Econom. Theory 163, 604–643.
Hirshleifer, D., Teoh, S.H., 2003. Herd behavior and cascading in capital markets: A review and synthesis. Eur. Financial Manag. 9, 26–66.
Houweling, P., Mentink, A., Vorst, T., 2005. Comparing possible froxies of corporate bond liquidity. J. Bank. Financ. 29 (6), 1331–1358.
Krolyi, A., Lee, K.H., Van, D.M., 2012. Understanding commonality in liquidity around the world. J. Financ. Econ. 105 (1), 81–112.
Lakonishok, J., Shleifer, A., Vishny, R.W., 1992. The impact of institutional trading on stock prices. J. Financ. Econ. 32 (1), 23–43.
Lao, P., Singh, H., 2011. Herding behaviour in the chinese and indian stock markets. J. Asian Econ. 22 (6), 495–506.
Levine, R., Schmukler, S.L., 2006. Internationalization and stock market liquidity. Rev. Financ. 10, 153–187.
Litimi, H., Bensaida, A., Bouraoui, O., 2016. Herding and excessive risk in the american stock market: A sectoral analysis. Res. Int. Bus. Financ. 38, 6–21.
Ma, R., Anderson, H.D., Marshall, B.R., 2018. Stock market liquidity and trading activity: Is china different?. Int. Rev. Financ. Anal. 56, 32–51.
Nagel, S., 2012. Evaporating liquidity. Rev. Financ. Stud. 25 (7), 2005–2039.
Nofsinger, J.R., Sias, R.W., 1999. Herding and feedback trading by institutional and individual investors. J. Financ. 54 (6), 2263–2295.
Rosch, C.G., Kaserer, C., 2013. Market liquidity in the financial crisis: The role of liquidity commonality and flight-to-quality. J. Bank. Financ. 37, 2284–2302.
Sarr, A., Lybek, T., 2002.'Measuring liquidity in financial markets. IMF Working paper, 02/232, 1-64.
Tan, L., Chiang, T.C., Mason, J.R., Nelling, E., 2008. Herding behavior in chinese stock markets: An examination of a and b shares. Pac.-Basin Financ. J. 16 (1–2), 61–77.
Vo, X.V., Phan, D.B.A., 2016. Herd behavior in emerging equity market: Evidence from vietnam. Asian J. Law Econ. 7 (3), 369–383.
Vo, X.V., Phan, D.B.A., 2017. Further evidence of the herd behavior in vietnam stock market. J. Behav. Exp. Financ. 13, 33–41.
Vo, X.V., Phan, D.B.A., 2019. Herd behavior and idiosyncratic volatility in a frontier market. Pac.-Basin Financ. J. 53, 321–330.
Welch, I., 2000. Herding among security analysts. J. Financ. Econ. 58 (3), 369–396.

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Erratum

Erratum regarding missing Declaration of Competing Interest statements in previously published articles

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Declaration of Competing Interest statements were not included in the published version of the following articles that appeared in previous issues of "Journal of Behavioral and Experimental Finance".
The appropriate Declaration/Competing Interest statements, provided by the Authors, are included below.

(1) "Simulation-based learning using the RIT market simulator and RIT decision cases" [Journal of Behavioral and Experimental Finance, 2019; 23C: 12-22] https://doi.org/10.1016/j.jbef.2019.05.003.

Declaration of competing interest: The authors declare the following financial interests/personal relationships which may be considered as potential competing interests: The RIT simulation-based learning software referred to in the article was invented and developed by the authors who have a financial interest to support on-going development.

(2) "Cross-border transactions, mergers and the inconsistency of international reference points" [Journal of Behavioral and Experimental Finance, 2019; 22C: 14-21] https://doi.org/10.1016/j.jbef.2019.01.001.

Declaration of competing interest: The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

(3) "Does personality predict financial risk tolerance of pre-retiree baby boomers?" [Journal of Behavioral and Experimental Finance, 2019; 23C: 124-132] https://doi.org/10.1016/j.jbef.2019.06.001.

Declaration of competing interest: The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

(4) "The disposition effect, performance, stop loss orders and education" [Journal of Behavioral and Experimental Finance, 2019; 24C: 100240] https://doi.org/10.1016/j.jbef.2019.100240.

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(5) "Is all politics local? Regional political risk in Russia and the panel of stock returns" [Journal of Behavioral and Experimental Finance, 2018; 21C: 70-82] https://doi.org/10.1016/j.jbef.2018.11.002.

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(6) "Herding and equity market liquidity in emerging market. Evidence from Vietnam" [Journal of Behavioral and Experimental Finance, 2019; 24C: 100189] https://doi.org/10.1016/j.jbef.2019.02.002.

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(7) "Application of situational stimuli for examining the effectiveness of financial education: A behavioral finance perspective" [Journal of Behavioral and Experimental Finance, 2018; 17C: 68-75] https://doi.org/10.1016/j.jbef.2017.12.009.

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(8) "Examining socially responsible investment preferences: A discrete choice conjoint experiment" [Journal of Behavioral and Experimental Finance, 2018; 17C: 83-96] https://doi.org/10.1016/j.jbef.2018.01.001.

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(9) "Countercyclical risk aversion: Beyond financial professionals" [Journal of Behavioral and Experimental Finance, 2018; 18C: 94-101] https://doi.org/10.1016/j.jbef.2018.03.001.

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(12) "Assessing consumer literacy on financial complex products" [Journal of Behavioral and Experimental Finance, 2019; 22C: 93-104] https://doi.org/10.1016/j.jbef.2019.02.005.

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(14) "Herd behavior and mood: An experimental study on the forecasting of share prices" [Journal of Behavioral and Experimental Finance, 2019; 24C: 100232] https://doi.org/10.1016/j.jbef.2019.07.004.

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(15) "Why do some soccer bettors lose more money than others?" [Journal of Behavioral and Experimental Finance, 2018; 18C: 85-93] https://doi.org/10.1016/j.jbef.2018.01.010.

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