THE HERD BEHAVIOR AND THE FINANCIAL INSTABILITY

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ABSTRACT: *Given the international financial situation of the last 50 years, and considering the complexity and severity of the financial crises, it is important to study the episodes of financial instability, and especially to understand both operating mechanisms and propagation mechanisms. One endogenous mechanism of financial instability is the herd behavior, which may increase the volatility and the amplitude of any sub-part of the financial system. This paper aims to analyze this phenomenon, considering the behavior of the financial market participants, the role of information in the making decisions process, banking responsibility regarding the herd behavior. The paper also illustrates two examples of herd behavior (run bank and the "too many to fail" problem), and presents three herding measures, in an attempt to achieve a quantitative analysis of the phenomenon, besides the qualitative analysis exposed above.*

KEY WORDS: *financial instability; herd behavior; financial markets; information; signals.*

JEL CLASSIFICATION: *E44; G12; G21; G23.*

1. MARKET PARTICIPANT BEHAVIOR, HERD BEHAVIOR AND FINANCIAL INSTABILITY

In the last years there has been a great interest in herd behavior in financial markets.

The behavior of participants may lead to mispricing assets and to the accumulation of risk in the financial system, which may lead to financial instability. Participants are influenced by different macroeconomic factors, such as a long period of low nominal interest rates and low risk premiums, which may lead to excessive leverage and risk taking. During long periods of prosperity, market participants

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become complacent about the risk of loss – either through systematic under-estimation of the risks, or a reduction of the risk aversion due to increasing wealth.

Herding takes place when individuals or firms simultaneously act in a similar manner. Herding has different sources and can be associated with asset bubbles and irrational panic that leads to a market gridlock or to a quick reduction of prices in one or more markets. The increasingly rapid feedback contributes to the development of herding behavior. Therefore, in markets that do not have a system that collects information about the financial market activity, identifying the herding situation can be difficult.

2. HERD BEHAVIOR AND THE ROLE OF SIGNALS AND INFORMATION ON TRADING IN THE FINANCIAL MARKETS

In the financial markets, there are informed traders and uninformed traders sequentially trade an asset of unknown value. The price of the asset is set by a market maker. The presence of a price mechanism makes it more difficult for herding to arise, although there are cases in which it occurs (when there is uncertainty not only regarding the value of the asset but also regarding the occurrence of an information event).

Testing informational herd behavior is difficult. A trader herds if he trades against his own private information. The problem is that there are no data regarding the private information available to traders and, it is hard to know when traders decide not to follow it.

Herding can arise in financial markets. Through sequential trading, if the only source of uncertainty is the asset's fundamental value, traders will always find it optimal to trade on the difference between their own information (the history of trades and the private signal) and the commonly available information (the history only). Therefore, it will never be the case that agents neglect their information to imitate previous traders' decisions (i.e., they herd). In contrast, when there are multiple sources of asymmetric information between the traders and the market maker (e.g., asymmetric information on the asset's volatility) herd behavior may arise (Dasgupta et al., 2010).

An asset is traded over many days; at the beginning of each day, an informational event may occur, which causes the fundamental asset value to change. In this case, some traders receive private information on the new asset value. These traders trade the asset to benefit from their informational advantage over the market maker. If no event has occurred, all traders in the market are noise traders (they trade for non-information reasons only: liquidity or hedging motives). Whereas the informed traders know that they are in a market with private information (since they themselves are informed), the market maker does not. This asymmetry of information between traders and the market maker implies that the market maker moves the price too "slowly" in order to take into account the possibility that the asset value may have not changed (in which case all trading activity is due to non-informational motives). As a result, a trader, even with a bad signal, may value the asset more than the market maker does. Therefore, he will trade against his own private information and herd-buy (Dasgupta et al., 2010).

The precision of private information is an important parameter, which opens the possibility that informed traders may receive noisy signals, and that they may find it optimal to ignore them and engage in herd behavior. Therefore, the sequence by which trades arrive in the market is also important. Thus, it is impossible an estimation using only the number of buy orders or sell orders in a specific day and it is necessary to consider the entire history of trading activity of each day of trading.

Herd behavior arises in equilibrium and there is information content in the sequence of trades. Thus, informed may receive incorrect information. This has some consequences for estimates of trading informativeness.

Herd behavior generates serial dependence in trading patterns. Herding also causes informational inefficiencies in the market, like the price misalignment. If these fluctuations are severe, they may lead to financial instability.

If it is taken into consideration the parameter τ that measures the informativeness of the signals, when $\tau \to 0$, the densities are uniform and the signals are completely uninformative. As τ increases, the signals become more and more informative. For $\tau \in [0,1)$, the beliefs are bounded (no signal realizations, even the most extreme ones, reveal the asset value with probability one). For $\tau \geq 1$, the beliefs are unbounded (some high /low signal realizations are possible when the asset value is high /low and the signal is perfectly informative. As τ tends to infinity, the measure of perfectly informative signals tends to one.

An informed trader knows that an information event has occurred, and that the asset value has changed. His signal is informative on whether the event is good or bad. According to the received signal realization and to the precision τ, he is not completely sure of the effect of the event on the asset value. For example, he may know that there has been a change in the investment strategy of a financial unit, but he can't be sure of whether this change will affect the asset value in a positive way or a negative way. The parameter τ is a measure of the precision of the information that the trader receives, or the ability of the trader to process such private information. Given the signal structure, informed traders are heterogeneous, because they receive signal realizations with different degrees of informativeness about the fundamental value of the asset.

There are two aspects worth mentioning. First, an informed trader engages in herd-buying at time t of day d when he buys upon receiving a bad signal. An informed trader engages in herd-selling at time t of day d when he sells upon receiving a good signal. Thus, a trader herds when he trades against his own private information. Since traders receive different signals, at a given point in time, traders with less informative signals will herd, and traders with more informative signals will not herd. At any given time t, it is possible to detect if an informed trader herds for a positive measure of signals. If a trader is engaged in a herd-buying behavior, he buys despite a bad signal. Second, there is herd behavior at time t of day d when there is a positive measure of signal realizations for which an informed trader either herd-buys or herd-sells. Herd behavior arises because prices move “too slowly” as buy and sell orders arrive in the market.

At the beginning of an information-event day, there is a sequence of buy orders. Informed traders, knowing that there has been an information event, attach a certain probability to the fact that these orders come from informed traders with good signals. The market maker attaches a lower probability to this event, because he considers a great possibility that there is no information event, and that all the buys came from noise traders. Thus, after a sequence of buys, he will update the prices upwards, but by less than the movement in traders’ expectations. Because traders and the market maker have different interpretations regarding the history of trades, the expectation of a trader with a bad signal may be higher than the ask price, in which case it herd-buys. Therefore, for any finite τ , herd behavior arises with positive probability. Herd behavior can be misdirected if an informed trader can engage in herd-buy (sell) in a day of bad (good) information event.

Herding can arise because of uncertainty on whether an information event has occurred. When $\tau > 1$, extreme signals indicate the true value of the asset, and traders will not herd. In the case of τ tending to infinity, all signal realizations are perfectly informative, and no informed trader herds. Even if there is a possibility of herd behavior, there is also allows a possibility that some traders (when $\tau > 1$) or all traders (when $\tau \to \infty$) will rely on their private information and will not herd.

The probability of herding also depends on others parameters. For example, when α (the probability of an information event) is close to zero, the market maker believes that there is no information event. He barely updates the prices as trades arrive in the market, and herding arises as soon as there is an imbalance in the order flow. But if α is close to 1, the market maker and the informed traders similarly update their beliefs, and herding will not occur.

Herding is also important for the informational efficiency of the market. During periods of herd behavior, private information is aggregated less efficiently by the price, as informed traders with good and bad signals take the same action. When traders herd for all signal realizations, the market maker is unable to make any inference on the signal realization from the trades, but he updates his belief on the asset value, since the action remains informative on whether an information event has occurred. Since the market maker never stops learning, he gradually starts to interpret the history of past trades more and more similarly to the traders and, as a result, the measure of herders shrinks.

During an information-event day, the measure of herders change with the sequence of trades, and it may become positive more than once at different times of the day. Given that information always flows to the market, the bid and ask prices converge to the asset value. In the end, the market maker learns whether a good event, a bad event, or no event occurred. The nature and severity of an event may lead or may not lead to financial instability (exogenous financial instability).

3. HERD BEHAVIOR, STOCK RETURNS AND FINANCIAL INSTABILITY

The trading behavior of institutional money managers implies that a tendency to herd (to imitate each other trades). Given the great number of these investors in financial markets, the price impact of institutional herding is very important.

Persistent institutional trading associated with the return reversals has economic implications on the price impact of institutional herding: a) institutions are affected by the behavioral bias that leads them; b) there are consequences of the reputational concerns of delegated portfolio managers: the need to impress investors' opinion creates endogenous herding: because better informed managers receive more correlated information, fund managers will trade in a correlated way, which leads to a excessively keen to buy /sell assets that have been persistently bought /sold in the past, which determines mispricing and return reversals; c) the negative association between institutional trading and stock returns is a result of the institutions' trade against the insiders that have superior information regarding the future cash flows; d) retail flows determine the relationship between institutional trading and return reversals: retail flows are negatively correlated with future returns, which, if are severe, will lead to financial instability.

Regarding the impact of institutional herding on the asset prices, it is characterized by a dichotomy. The short-term impact of institutional trade underlines that herding has a stabilizing effect on prices. The long-term impact of institutional trade underlines that herding predicts reversals in returns.

Regarding the short-term return, the magnitude of the positive short-term return that follows an institutional buy herd is higher when there are more institutional traders and, and smaller when herding becomes more persistent. Thus, positive short-term return following an institutional buy sequence is higher for stocks characterized by higher institutional trading. As institutional buying is persistent over time, the magnitude of the expected short-term return diminishes, which is totally different of what happens with long-term reversals.

The long-term return is related with two crucial quantities: the weight of the institutional traders' reputation and the measure of the market's level of optimism regarding the liquidation value of the asset conditional on the trade at t . Because of the longer sequence of consecutive institutional purchases, the market increases the level of optimism of the expected payoff. Thus, the magnitude of the negative long-term return that follows an institutional buy herd is higher when institutions take into consideration the reputation and when herding is more persistent. This means that the degree of reversal in long-term returns that follows an institutional buy sequence is higher for stocks that are traded by institutional managers with higher career concerns. The degree of reversal is higher when institutional herding behavior is more persistent over time.

Institutional investors (pension funds, mutual funds) tend to herd: they trade in the direction of recent institutional trades, while non-institutional traders (individuals) tend to trade as contrarians: individuals buy assets after prices decrease and sell assets after prices increase.

The link between market activity, mispricing, and return continuation is important in order to explain the interrelationships in the financial markets. High trading volume characterizes episodes of increasing mispricing, while reductions in mispricing are associated with less active markets. Thus, in the asset markets dominated by institutional traders, high trading volume is associated with increasing mispricing, which, measured by the expected long-term return obtained from purchasing the stock, will increase the market's belief about the liquidation value. In the situation of an optimistic market, trades can arise from optimistic fund managers (when the manager has positive information, making future managers keener to buy, which leads to the exacerbation of mispricing) or can arise from pessimistic proprietary traders (when proprietary trader has negative information, making fund managers less keen to buy, which leads to an amelioration of mispricing). These considerations may affect the stability of the financial sector, leading to endogenous financial instability episodes (Dasgupta et al., 2010).

4. HERD BEHAVIOR, THE RESPONSIBILITY OF BANKS AND INSTITUTIONAL ARRANGEMENTS

The risk position depends on what is happening to other banks or financial units and to the entire sector, the so called "aggregation problem" or "the problem of interconnectedness", related to "pecuniary externalities" aspect. There may be a correlated contagion between banks and other financial units. Considering the existing interdependencies, financial markets are not always efficient in providing correct price signals. If the value of the assets is reduced, a bank or other financial units must raise additional equity or sell assets in order to maintain its risk position. Therefore, the bank or the other financial units have a constrained behavior. De-leveraging of one bank or important financial unit affects the others and the whole sector. Therefore, the bank's (financial units') risk management must anticipate how the environment is going to change. In addition, when in a financial bubble the herd is running, those in charge must stay outside the bubble in order to remind everyone of the sustainable long-run equilibrium, i.e. the inter-temporal fix point. Such an inter-temporal fix point would have prevented some of the previous bubbles and it would avoid other financial exuberance episodes or financial instability episodes. Even if we take into account a better institutional infrastructure to manage the issue of interconnectedness of risks, it's the bank's (financial unit's) responsibility to be informed regarding the changing environment.

The necessity to include long-run aspects in a bank's (financial unit's) risk management reduces the possibility to increase profits through financial innovation. But if the bank (or other financial units) does not want to have a liquidity shortage (therefore to need to raise the capital or to sell its assets, it has to include long-run risks in its calculus.

In the same time, it's the interest of the banking sector / financial sector to propose international institutional arrangements that prevent failures. If the behavior incentives are false, if moral hazard prevails and if price signals are misleading, the risk of the banking sector / financial sector is endogenous.

However, voluntary instability-preventing institutional arrangements are difficult to acquire. One reason is that banks (or other financial units) have a strong interest in financial innovation. Therefore, by developing new financial products, banks (or other financial units) can make a profit relative to their competitors. Thus, they try to outbid themselves in new products, and the banking sector is exhibiting a herding behavior. Therefore, there is a need for regulation. However it is unknown how an efficient institutional design of the financial sector (comprising rules laws and regulatory mechanisms) should look like.

5. HERD BEHAVIOR - DEPOSIT BANK RUN AS A MANIFESTATION OF HERDING: EFFECTS ON FINANCIAL STABILITY

Some financial units receive information regarding the payoffs to the risky long-term assets, while the uninformed financial units coordinate on the number of early withdrawals observed (Lai, 2002). Information spillovers, together with payoff externalities, lead to a panic bank run. Depositors receive preference shocks and impatient depositors withdraw early. The ratio of impatient depositors is uncertain and there is aggregate liquidity risk in the economy.

Banks offer deposit contracts that promise depositors, who deposit 1 unit of endowment at date 0, a return 1 at date 1 or an equal share of bank profits at date 2. Each impatient depositor withdraws at date 1. Patient depositors may withdraw some or all of their deposits at date 1. Suppose that a patient depositor leaves the amount $k \in [0,1]$ in the bank (withdraw $1-k$); the amount k is reinvested and yields Rk , where R is a random variable, which takes on a high value, $H > 1$, with probability p , and 0 with probability $1-p$. There is an externality in consumption; therefore, the available amount for consumption at date 1 depends on the aggregate level of consumption desired at that date, or,

$$c_1 = \begin{cases} 1-k & if\ K \leq Km \\ (1-a)(1-k) & if\ K > Km \end{cases}$$

where K is aggregate reinvestment at date 1.

Consumers do not know if they are patient or impatient until date 1. However, some of them t are impatient, where t is a random fraction. At date 1, the t can have one of the three values: $t \in \{0, t_1, t_2\}$, with probabilities r_0 , r_1 , r_2. In addition, a random fraction of patient depositors α receive perfect information about prospective date 2 returns. α is realized at date 1 and can have one of two values, $\alpha \in \{0, \alpha m\}$, with probability $1-q$ and q . The informed depositors will decide how much to leave in the bank based on their information $k^i(R)$. They will withdraw based on the poor fundamentals ($k^i(R)$=0). The uninformed depositors will notice the aggregate reinvestment level and will recognize that the aggregate level of date 1 investment contains information about the informed depositors’ signal. The uninformed depositors will try to extract the information, and will try to condition their withdrawals on aggregate investment, $k(K)$. When uninformed depositors notice a low level of aggregate investment, they cannot say whether it is because of the high proportion of impatient depositors $t = t_2$, or whether informed depositors had received bad news, $R = 0$. Aggregate investment at date 1 is given by the equation:

$$K = \alpha (1 - t)k^I(R) + (1 - \alpha)(1 - t)k(K)$$

Thus, the uninformed individuals observe the alignment at the bank but are unable to say whether depositors in the alignment are impatient depositors or informed depositors who have received bad news.

There are conditions under which a panic equilibrium exists where all depositors withdraw ($K = 0$) upon observing a high level of withdrawals even if no informed agents have received bad news about asset returns. Therefore, bank runs can occur when fundamentals are poor or when liquidity needs are high.

Thus, bank runs imply a herd situation where agents observe private but noisy signals and take action based on the private signals and publicly observable actions of agents that preceded them.

Agents have to make similar decisions. They face a discrete action space in which the number of actions is limited. Information is private and imperfect, but actions can be publicly observed, leading to “social learning” in which agents who have not taken action try to infer other agents’ information from their actions. Therefore, the herding appears where the agents disregard their private information and rely only on public information. In addition, it is possible that agents “herd” on a wrong choice. An information cascade takes place when no new information is revealed by the agents’ actions. In any herding situation, the information structure implies that an information cascade occurs when agents herd. Once a cascade appears, with agents herding on a particular action, the cascade persists. The continuity of signals leads to the fragility of cascades and even to financial instability; but a contrary action or small amounts of new information can reverse an existing cascade. Therefore, the herding behavior may be rational.

6. TOO MANY TO FAIL AND BANK HERDING

If it is considered a situation of two banks with asymmetric sizes, a big bank and a small bank, it is possible to emphasize the effects of “too-many-to-fail” problem. The big bank has incentives to differentiate itself (because the big bank can acquire the small bank when it fails and because the bailout subsidy of the large bank does not increase when the small bank fails), while the small bank has incentives to herd with the big bank (because the small bank has no opportunity, or limited opportunity and because the bailout subsidy for the small bank increases when the big bank fails).

There can be supposed two not-equal-sized banks: bank A is the large bank and bank B is the small bank.

Figure 1 shows four situations: a) SS (both banks survive); b) SF (bank A survives, bank B fails); c) FS (bank A fails, bank B survives); d) FF (both banks fail).

In the state SF, the large bank has sufficient funds to purchase the small bank. Thus, the regulator sells the small bank to the large bank; it is assumed that the size of bank A is sufficiently large, so that the available funds of the small bank are not sufficient to acquire the big bank. Therefore, in state FS, assets of the big bank are purchased only by outside investors. If the cost of bailout is smaller than the misallocation cost, the regulator bails out the big bank, otherwise it is liquidated to outsiders. Therefore, the closure/bailout policy for the regulator is as follows: a) in state SF, the big bank acquires the small bank; b) in state FS, the big bank is bailed out; otherwise it is liquidated to outsiders; c) in state FF: either both banks' assets are sold to outsiders, either the regulator bails out both banks; d) the regulator does not intervene in state SS (Acharya & Yorulmazer, 2007).

Regarding the banks' choice of correlation, in the state FS, the small bank cannot acquire the big bank. Therefore, there is no additional gain for the small bank to be the only survivor, while in the state FF, the small bank may benefit from the bailout. The small bank does not have any incentive to differentiate itself from the big bank: it is indifferent between the low and the high correlation or prefers to be correlated with the big bank.

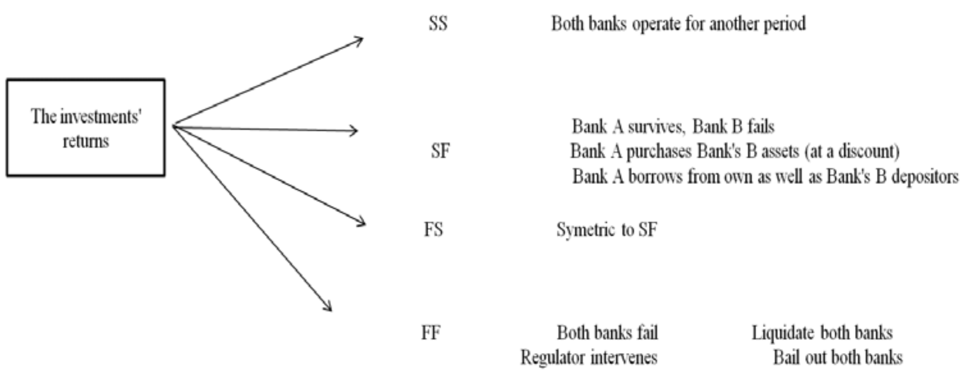

Figure 1. Bank failing – bank surviving

The case of the big bank is different: when the big bank is the only survivor, it can acquire the small bank's assets at a discount, which creates incentives to differentiate. Regardless of the situation of the small bank (in both states FS and FF), the big bank will be bailed out, and it will not have any incentive to herd or to differentiate. Therefore, the two banks have different and conflicting incentives.

If we take into consideration a more realistic situation, the one that includes n banks, where each bank invests either in a common asset or in a bank-specific asset, the resources of surviving banks may not enough to purchase all the failed banks when the number of bank failures is large. Therefore, the "too-many-to-fail" problem also arises as an n-bank situation, in which a severe contagion and spillover externalities may lead to financial instability.

When the number of bank failures is high, the regulator believes that ex-post is optimal to bail out the failed banks in order to avoid losses resulting from the closure and liquidation of banks, while when the number of bank failures is small, failed banks can be saved by acquiring them by other surviving banks; thus, during financial crises that affect a significant portion of the banking industry (systemic crises), the market solution involves the private sector participation in the form of acquisition of failed banks. Thus, the regulator bails out banks during systemic banking crises, but during minor crises it resorts the resolution to the private sector. This is an incentive to banks to herd and to increases the risk of a large number of banks failures. While the "too-big-to-fail" problem affects the large banks, the "too-many-to-fail" problem affects small banks, giving them incentives to herd. Thus, the regulator loses credibility by not being able to implement a consistent over time resolution policy. The policy of bailing out banks during systemic crises creates herding incentives for banks (in order to increase the likelihood of being bailed out), resulting in too many systemic banking crises (by lending to similar industries or by betting on common risks, such as interest and mortgage rates). Therefore, to prevent this kind of situation, the regulator must implement a policy that does not involve the rescue of banks (although this kind of policy is not credible when systemic crises or financial instability episodes occur).

The central banks are seen as crisis managers, which can rescue banks in times of financial instability. The central banks also have the role of crisis prevention, using prudential regulation to mitigate the systemic risk (the risk that many banks fail together). But the crisis-prevention role of a central bank is in conflict with the crisis-management role, because of the lack of commitment in optimal policies, which induces bank behavior to increases the probability of systemic banking crises and financial instability episodes.

It is important to underline that there may be other sources of bank herding and that the "too-many-to-fail" channel of bank herding may be complementary to the other channels (like bank herding based on reputational considerations and herding by banks to exploit their limited-liability options).

The "too-many-to-fail" problem is prevalent in those banking systems (a) where the governance of banks is poor (where agency problems, like fraud by bank owners, are severe, and therefore banks are required to hold a high equity stake for incentive reasons; (b) where the fiscal costs of bailing out banks are high (Acharya & Yorulmazer, 2007).

7. HERDING MEASURES

There are three mainly used herding measures.

The first measure takes into consideration the number of buyers of asset i in quarter t as a fraction of the total number of active traders in the stock:

$$p_t^i = \frac{number\ of\ buyers}{number\ of\ buyers + number\ of\ sellers}$$

This represents a measure of trade imbalance. Each quarter p_i^t is ranked into two groups and the values of p_i^t are considered above the median as an imbalance of buys and values of p_i^t below the median as an imbalance of sells.

The second herding measure includes a buy herding measure and a sell herding measure. The measure of buy herding is:

$$BHM_{i,t} = (|p_i^t - E[p_i^t]|) - AF_{i,t}(|p_i^t > E[p_i^t]|)$$

The measure of sell herding is:

$$SHM_{i,t} = (|p_i^t - E[p_i^t]|) - AF_{i,t}(|p_i^t < E[p_i^t]|)$$

where p_i^t is the proportion of buyers among all institutions trading asset i in quarter t ; $E[p_i^t]$ is the expected proportion of buys for stock i during quarter t , estimated as the fraction of all trades across all assets that are buys during quarter t ; $AF_{i,t}$ is the adjustment factor that allows for random variation around the expected proportion of buys and sells under the hypothesis that institutions trade randomly and independently. The factor is calculated separately for the buy and sell herding measures, conditional on $p_i^t > E[p_i^t]$ or $p_i^t > E[p_i^t]$ (Dasgupta et al., 2010).

The herding persistence is measured by counting the number of consecutive quarters during which a stock exhibits buy or sell herding, using both the herding measure p_i^t and the signed herding measures $BHM_{i,t}$ and $SHM_{i,t}$. The herding persistence is considered to have values between $-n$ and n , where a value of $-n$ indicates that a stock exhibits persistent sell herding (low p_i^t) for n or more consecutive quarters, and a value of n indicates that a stock exhibits buy herding (high p_i^t) for n or more consecutive quarters. For trading persistence based on the signed herding measures, a value of $-n$ indicates low buy or sell herding (low $BHM_{i,t}$ or low $SHM_{i,t}$.) for n or more consecutive quarters, while a value of n indicates intense buy or sell herding (high $BHM_{i,t}$ or high $SHM_{i,t}$.) for n or more consecutive quarters.

The persistence measure based on herding indicates a negative relation between herding persistence and stock returns. For the signed herding measures, the persistence of intense buy herding predicts negative future returns, while the persistence of intense sell herding predicts positive future returns.

The third herding measure makes a distinction between the theoretical studies that have tried to identify the mechanisms through which herd behavior arises and the empirical literature that followed a different path. The empirical literature does not test the theoretical herding models directly, but analyzes the presence of herding in financial markets through statistical measures of clustering. In some markets, fund managers cluster their investment decisions more than would be expected if they acted independently. This is important, as it reveals the behavior of financial market participants. But the decision clustering may or may not be due to herding (for example, it may be a result of a common reaction to public announcements). Therefore, it is very difficult to distinguish between spurious herding and true herd behavior.

CONCLUSIONS

Although most of the literature speaks about various factors affecting financial stability, such as information, asset bubbles, weak balance sheets of banks or other financial units, inadequate monetary policies and so on, however there are few studies addressing the topic of herd behavior, which has important theoretical and empirical implications, given the links and interconnections between financial market participants.

To sum up, herd behavior can be both irrational and rational. An irrational herd behavior is based on psychological factors that determine the course of the action of the financial actors (therefore, there are no objective factors of action). A rational herd behavior (profit-seeker) may result in an economic and financial boom, but in time leads to (endogenous) financial instability.

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