Journal of Banking & Finance 34 (2010) 1911–1921

Contents lists available at ScienceDirect

Journal of Banking & Finance

journal homepage: www.elsevier.com/locate/jbf

An empirical analysis of herd behavior in global stock markets

Thomas C. Chiang *, Dazhi Zheng

LeBow College of Business, Drexel University, PA 19104, United States

ARTICLE INFO

Article history:
Received 7 July 2009
Accepted 29 December 2009
Available online 4 January 2010

JEL classification:
G15
G14

Keywords:
Herding behavior
Cross-sectional stock dispersion
Financial crisis

ABSTRACT

This paper examines herding behavior in global markets. By applying daily data for 18 countries from May 25, 1988, through April 24, 2009, we find evidence of herding in advanced stock markets (except the US) and in Asian markets. No evidence of herding is found in Latin American markets. Evidence suggests that stock return dispersions in the US play a significant role in explaining the non-US market's herding activity. With the exceptions of the US and Latin American markets, herding is present in both up and down markets, although herding asymmetry is more profound in Asian markets during rising markets. Evidence suggests that crisis triggers herding activity in the crisis country of origin and then produces a contagion effect, which spreads the crisis to neighboring countries. During crisis periods, we find supportive evidence for herding formation in the US and Latin American markets.

1. Introduction

In the behavioral finance literature, herding is often used to describe the correlation in trades resulting from interactions between investors. This behavior is considered to be rational for less sophisticated investors, who attempt to mimic financial gurus or follow the activities of successful investors, since using their own information/knowledge would incur a higher cost.[1] The consequence of this herding behavior is, as Nofsinger and Sias (1999) note, "a group of investors trading in the same direction over a period of time". Empirically, this may lead to observed behavior patterns that are correlated across individuals and that bring about systematic, erroneous decision-making by entire populations (Bikhchandani et al., 1992). Thus, to achieve the same degree of diversification, investors need a larger selection of securities that constitute a lower degree of correlation. In addition, if market participants tend to herd around the market consensus, investors' trading behavior can cause asset prices to deviate from economic fundamentals. As a result, assets are not appropriately priced. Empirical investigations of herding behavior in financial markets have branched into two paths.[2] The first path focuses on co-movement behavior based on the measure of dynamic correlations. For instance, in their tests for financial contagion, Corsetti et al. (2005) find "some contagion, some interdependence" among Asian stock markets. Chiang et al. (2007) report that the contagion effect took place during the early stage of the Asian financial crisis and that herding behavior dominated the later stage of the crisis, as the bad news became widespread and investors realized the full impact of the crisis. Boyer et al. (2006) discover that in emerging stock markets, there is greater co-movement during high-volatility periods, suggesting that crises that spread through the

* Corresponding author. Tel.: +1 215 895 1745; fax: +1 215 895 2995.
E-mail addresses: chiangtc@drexel.edu (T.C. Chiang), dz37@drexel.edu (D. Zheng).

[1] Villatoro (2009) analyzes the relationship between financial intermediaries' (FI) reputation and herding and argues that financial intermediaries with high reputation are prone to invest in information, whereas those with poor reputation will tend to imitate other financial intermediaries' portfolio decisions.

[2] A number of research papers have focused on market participants' herding behavior, from mutual fund managers to institutional analysts. For instance, Grinblatt et al. (1995) find evidence of herding activity in mutual fund markets because fund managers tend to buy securities that can make a profit. Their evidence indicates that 77 percent of mutual fund investors are "momentum investors." Welch (2000) finds that the most recent revisions of investment recommendations have a positive influence on the next analyst's revision. His finding suggests that herding toward the consensus is less likely to be caused by fundamental information, implying that analysts herd based on little or no information. Wermers (1999) finds little herding by mutual funds in trading average stocks; he finds more evidence of herding in trades of small stocks and in trades by growth-oriented funds. Lakonishok et al. (1992) report that pension managers are buying (selling) the same stocks that other managers buy (sell) and follow a positive-feedback trading strategy. In contrast, some of the literature fails to detect herding behavior for certain market participants. In a paper by Gleason et al. (2004), investors do not herd during periods of extreme market movements using ETFs. Furthermore, they show that the market's reaction to news is not symmetric for up markets and down markets.

0378-4266/$ - see front matter © 2010 Elsevier B.V. All rights reserved.
doi:10.1016/j.jbankfin.2009.12.014

asset holdings of international investors are mainly due to contagion rather than to changes in fundamentals.[3]

The second path for examining herding behavior focuses on the cross-sectional correlation dispersion in stock returns in response to excessive changes in market conditions. By observing information asymmetry in emerging markets, researchers anticipate that investors in these markets are more likely to demonstrate herding behavior. In their study of international herding behavior, Chang et al. (2000) find significant evidence of herding in South Korea and Taiwan and partial evidence of herding in Japan. However, there is no evidence of herding on the part of market participants in the US and Hong Kong. By focusing on Hong Kong's stocks, Zhou and Lai (2009) discover that herding activity in Hong Kong's market tends to be more prevalent with small stocks and that investors are more likely to herd when selling rather than buying stocks. Turing to the Chinese markets, Demirer and Kutan (2006) investigate whether investors in Chinese markets, in making their investment decisions, are following market consensus rather than private information during periods of market stress. Their study reveals no evidence of herding formation, suggesting that market participants in Chinese stock markets make investment choices rationally. Yet, in a recent study of Chinese stock markets, Tan et al. (2008) report that herding occurs under both rising and falling market conditions and is especially present in A-share investors.[4] Thus, the evidence from the studies cited above shows mixed results and that most herding behavior is present in emerging markets and not in advanced markets.

Although the above-mentioned studies have made contributions to describing herding behavior in various aggregate markets, they are mainly restricted to a single market boundary. No attempts have been made to examine herding behavior across national borders. The empirical results based on such a setting are likely to produce two drawbacks. First, from an econometric point of view, there is the potential for bias in the OLS estimate when important variables are excluded. Sometimes, it could give rise to wrong signs (Kennedy, 2008, p. 368). Second, the empirical evidence derived from a few selected countries essentially shows local behavior, and hence, the testing results do not necessarily reflect a broader test for the validation of a global phenomenon.

Recent experience suggests that financial shocks do not stand alone in a country or region. Forbes and Rigobon (2002) find that financial markets are somehow interdependent during the high-volatility period. Chiang et al. (2007) find significant evidence of comovements among various stock markets during the financial turmoil at the later stage of the Asian crisis. In their study of cross-country variations in market-level stock volatility, Bekaert and Harvey (1997) report that a higher return dispersion is associated with higher market volatility for the more developed markets. They suggest that dispersions may reflect the magnitude of firm-/industry-level information flows for these markets. Motivated by these empirical studies, this paper examines herding behavior by testing the cross-sectional stock return dispersions in relation to a set of explanatory variables, including absolute domestic stock returns, excess domestic market conditions, and foreign market influences.

This paper differs from previous research in the following respects. First, the data set used by Chang et al. (2000), Demirer and Kutan (2006), Tan et al. (2008), and Zhou and Lai (2009) in their investigation of herding behavior is confined to a relatively small set of observations, and their studies are restricted to a few local markets. The current study contains 18 economic units categorized into advanced, Latin American, and Asian markets. Second, we identify the significance of the US market in examining local market herding behavior; the evidence shows that in the majority of cases, investors in each national market are herding around the US market. Third, employing a larger data set allows us to examine different investing behavior associated with different regions. Specifically, we find evidence of herding behavior occurring in countries classified as advanced markets and in Asian markets. However, we find less supportive evidence for herding behavior in the four Latin American markets. Fourth, we investigate the role of financial crisis in testing herding behavior. Specifically, consistent with common intuition, herding behavior appears to be more apparent during the period in which the crisis occurs. In particular, we find herding in the Mexican and Argentine stock markets, respectively, when the 1994 Mexican and 1999 Argentine crises took place. Otherwise, no evidence of herding is found in these Latin American countries over the entire sample period.

The remainder of this paper is organized as follows. Section 2 presents the estimation model for examining herding behavior. Section 3 describes the data. Section 4 reports the empirical evidence of herding behavior and estimates the effect of the US market. Section 5 examines herding behavior under different market conditions. Section 6 contains a summary and conclusions.

2. Basis of the estimated model

Two studies have proposed methods for detecting herding behavior using cross-sectional data on stock returns: Christie and Huang (1995) and Chang et al. (CCK) (2000). Christie and Huang suggest that the investment decision-making process used by market participants depends on overall market conditions. During normal periods, rational asset-pricing models predict that the dispersion in cross-sectional returns will increase with the absolute value of the market returns, since individual investors are trading based on their own private information, which is diverse. However, during periods of extreme market movements, individuals tend to suppress their own private information, and their investment decisions are more likely to mimic collective actions in the market. Individual stock returns under these conditions tend to cluster around the overall market return. Thus, it can be observed that herding will be more prevalent during periods of market stress, which is defined as the occurrence of extreme returns in a market portfolio. To measure the return dispersion, Christie and Huang (1995) propose the cross-sectional standard deviation (*CSSD*) method, which is expressed as:

$$CSSD_t = \sqrt{\frac{\sum_{i=1}^{N}(R_{i,t} - R_{m,t})^2}{(N-1)}} \tag{1}$$

where N is the number of firms in the portfolio, $R_{i,t}$ is the observed stock return of industry i at time t, and $R_{m,t}$ is the cross-sectional average stock of N returns in the portfolio at time t. Since the $CSSD_t$ calculated by squared return-deviations tends to be sensitive to outliers, in a later study, CCK propose the cross-sectional absolute deviation, which is measured by:

$$CSAD_t = \frac{1}{N}\sum_{i=1}^{N}|R_{i,t} - R_{m,t}| \tag{2}$$

To conduct a test for detecting herding activity, we modify CCK's specification and write:

[3] In their investigation of the dynamic correlations among six international stock market indices (US, UK, France, Germany, Japan, and Hong Kong) and their relationship to inflation fluctuation and market volatility, Cai et al. (2009) find evidence that international stock correlations are significantly time-varying and the evolution among them is related to cyclical fluctuations of inflation rates and stock volatility.

[4] Hwang and Salmon (2006) examine herding behavior in the US, the UK, and the South Korean stock markets, and they find beta herding when investors believe they know where the market is heading rather than when the market is in crisis.