Journal of Economic Behavior & Organization 76 (2010) 283–295

Contents lists available at ScienceDirect

Journal of Economic Behavior & Organization

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

# Do investors herd in emerging stock markets?: Evidence from the Taiwanese market

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ARTICLE INFO

*Article history:*
Received 8 April 2009
Received in revised form 22 June 2010
Accepted 30 June 2010
Available online 8 July 2010

*JEL classification:*
G14
G15

*Keywords:*
Herd behavior
Equity return dispersion
Taiwan Stock Exchange
Non-linear and state space models

ABSTRACT

This paper has three main contributions to the literature on investor herds. First, it extends investor herding studies to an emerging yet relatively sophisticated Taiwanese stock market at the sector level by using firm level data. Second, it employs different methodologies designed to test the existence of investor herds to better understand the sources of herd behavior. Third, it discusses the implications of different herding measures for investors exposed to systematic and unsystematic risks. We find that the linear model based on the cross-sectional standard deviation (CSSD) testing methodology yields no significant evidence of herding. However, the non-linear model proposed by Chang et al. (2000) and the state space based models of Hwang and Salmon (2004) lead to consistent results indicating strong evidence of herd formation in all sectors. We also find that the herding effect is more prominent during periods of market losses. Our results suggest limited diversification opportunities for investors in this market, especially during periods of market losses when diversification is most needed. Further research is necessary to see whether similar findings hold for other emerging markets.

Published by Elsevier B.V.

## 1. Introduction

Formation of investor herds has been proposed as an alternative explanation of how investors process information and make investment choices. Herding is simply defined as an investment strategy based on mimicking other investors' actions or the market consensus (e.g., Bikhchandani and Sharma, 2001). In this paper, we extend herding tests to the Taiwanese stock market using firm level data within industry portfolios. To do so, we employ different testing methodologies proposed in the literature in order to provide further insight on the driving forces behind herd behavior. Finally, we explore the implications of the findings for diversified and undiversified investors.

We select the Taiwanese stock market for several reasons. First, the market is dominated by domestic individual investors, rather than institutional and foreign investors. Most individual investors tend to have less professional knowledge and cannot access information accurately and easily. However, there has been an increasing interest in the Taiwanese stock market by foreign investors over the past 6 years following the lifting of the trading restrictions on qualified foreign institutional investors in 2000. As a result, the value percentage traded by foreign institutional investors has exceeded that traded by domestic institutional investors since 2005 (Chen et al., 2008). In a market dominated by domestic individual investors with

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0167-2681/$ – see front matter Published by Elsevier B.V.
doi:10.1016/j.jebo.2010.06.013

limited access to information, one might argue that the resulting information asymmetry may lead these individual investors to follow the actions of other investors including more informed domestic and foreign institutional investors.

Second, despite being an emerging market, the Taiwanese stock market is highly developed. The ratio of average stock market total value to GDP, a commonly used measure of stock market development, in Taiwan during the period from 1975 to 2006 was 1.65, which is greater than that of the U.S. (1.25) and ranked first among 75 countries during this period.[1] If the results indicate evidence of herding, this suggests that herding may take place in a relatively developed yet still emerging stock market like Taiwan.

Third, we further focus on industry-wide evidence from Taiwan. In this regard, our study is a significant addition to the recent literature that tests herding behavior in an industry context (Choi and Sias, 2009). Providing evidence from an industry/sector perspective is interesting for several reasons: (i) the typical assignment of financial analysts takes place at the industry level and institutions also signal information through their industry classifications, (ii) many business managers make recommendations at the sector level, and (iii) investors may receive signals about a given firm based on information available about other firms in the same industry (Choi and Sias, 2009). Bikhchandani and Sharma (2001) also suggest that herd formation would be more likely to occur at the level of investments in a group of stocks such as stocks in an industry where investors face similar decision problems and can observe the trades of others in the group.

Fourth, there is limited and conflicting evidence on herd behavior in the Taiwanese stock market. To our best knowledge, there are only four empirical studies of herding behavior in the Taiwanese stock market. Using one of the methodologies employed in this paper, Chang et al. (2000) analyze daily equally weighted index return data from January 1976 to December 1995 and find significant evidence of herding in this market. However, their study examines firm level return data within the market portfolio without classifying individual firms into specific sectors. Lin and Swanson (2003) also study herd behavior in the Taiwanese stock market during the period 1996–2003 again using one of the methodologies we employ here, but they focus only on foreign investors and the most liquid stocks without classifying them into sector groups. They find no evidence that foreign investors herd in this market. Lin et al. (2007) examine daily trading data by foreign and domestic institutional investors for the fifty stocks that are most actively traded by institutional investors in Taiwan and find the herding tendencies of stocks to be more prominent for small cap stocks with high share turnover and high return volatility, thus suggesting market conditions and firm characteristics to be significant factors driving herd behavior. Using buying and selling volume data, Chen et al. (2008) find that qualified foreign institutional investors herd in the Taiwanese stock market. They show that industry effects, besides firm characteristics such as high past returns and large market capitalization, explain the herding behavior of foreign institutional investors.

Fifth, we employ two major testing methodologies. Previous studies based on return data hypothesize that herd behavior may be captured by examining either return dispersions or relative dispersion of the time-varying betas for assets. For the former, we employ linear and non-linear models based on "return dispersions" among individual firms; more specifically, cross-sectional standard deviations (CSSD) and cross-sectional absolute deviations (CSAD) across a particular sector. For the latter, we employ models based on a state space model specification proposed by Hwang and Salmon (2004). These two sets of models differ in the sense that the first two focus on the cross-sectional variability of returns, whereas the last two focus on the cross-sectional variability of factor sensitivities. Understanding which models yield results consistent with herd behavior provides information about the ways in which investors herd. Furthermore, the findings from the different testing methodologies have different portfolio diversification implications for currently diversified and undiversified investors as these methodologies are related to different types of risks in a portfolio, i.e. the firm-specific risk and the market risk. Therefore, employing different testing methodologies on the same data set provides valuable insight about the performance of diversification strategies for different types of investors in this market.

Given the limited work and conflicting evidence on herd behavior on Taiwan and the interesting institutional characteristic of this market (i.e. a large number of domestic individual investors with a small but growing number of foreign investors), we extend the earlier studies in three significant aspects by (i) providing industry/sector-specific evidence, (ii) employing different testing methodologies, and (iii) providing evidence using recent daily data from January 1995 to December 2006.

Looking forward, we find no significant evidence for herd behavior based on the linear model. However, the non-linear model and the state space based models lead to consistent results, indicating strong evidence of herd formation in all sectors analyzed, suggesting that herd behavior may be captured by examining either cross-sectional return dispersions in a non-linear fashion or through beta dispersions. This indicates that investors will have limited diversification opportunities in this market regardless of whether they currently hold diversified portfolios or undiversified positions. Portfolio diversification implications of our findings are consistent with the finding of Lin et al. (2007) that foreign investors and domestic mutual funds outperform the market in relatively stable periods, i.e. periods during which diversification is not as big of a concern as during periods of high volatility. In Section 2, we briefly summarize previous theoretical and empirical work on investor herds. Section 3 provides the details of different testing methodologies employed and compares the different theoretical implications of the methodologies for the sources of herd behavior. Section 4 presents data description and empirical results, as well as a comparison of the findings from the return dispersion based models and state space models. It also discusses the economic implications of the findings for investors. Finally, Section 5 concludes the paper and proposes further research.

[1] See Beck et al. (2000).