International Review of Financial Analysis 48 (2016) 140–149

Contents lists available at ScienceDirect

International Review of Financial Analysis

Herd behavior and equity market liquidity: Evidence from major markets

Emilios C. Galariotis [a], Styliani-Iris Krokida [b], Spyros I. Spyrou [b,*]

[a] Audencia Business School, Institute of Finance, Nantes, France
[b] Athens University of Economics & Business, Athens, Greece

ARTICLE INFO

Article history:
Received 15 November 2015
Received in revised form 22 September 2016
Accepted 23 September 2016
Available online 28 September 2016

JEL classification:
G02
G14
G15

Keywords:
Herding
Liquidity
Financial crisis
Major equity markets

ABSTRACT

This paper provides new evidence on the relation between herd behavior and equity market liquidity, an issue that has been neglected when it comes to studying herd behavior towards the consensus. We use equity price data for the G5 markets, and initially find no evidence of herding. When, however, we condition on the liquidity of stocks we find significant evidence of herd behavior for high liquidity stocks, for most countries, a result robust to different definitions of the crisis period and different measures of liquidity. The only exception is Germany for which there is weaker evidence of herding in high liquidity stocks. Variance decomposition tests indicate that the variance of the average equity market liquidity is affected by return clustering, especially during the crisis and post-crisis period an effect that is more pronounced for the US market.

1. Introduction

This paper provides new evidence on the relation between herd behavior and equity market liquidity. Herding, a form of correlated behavior, may be defined as the process where investors are trading in the same direction, imitating each other, and base their decisions upon the actions of previous investors, or as a behavior convergence to the average (see, among others, Nofsinger & Sias, 1999; Welch, 2000; Hirshleifer & Teoh, 2003; Hwang & Salmon, 2004). The empirical literature on herding may be broadly divided in two main strands. On the one hand many studies investigate institutional herd behavior (Lakonishok, Shleifer, & Vishny, 1992; Sias, 2004; among others), while on the other hand many studies employ market data and examine herding towards the consensus (Christie & Huang, 1995; Chang, Cheng, & Khorana, 2000; among others).

Our study contributes to the second strand in a number of ways. Firstly, we investigate a specific gap in the literature: the role of liquidity on herd behavior has been neglected when it comes to herd behavior towards the consensus; previous studies concentrate on the relationship between institutional behavior and liquidity.[1] This is particularly important since previous studies suggest that liquidity predicts equity returns (Amihud & Mendelson, 1986; Brennan, Chordia, & Subrahmanyam, 1998), and that different states of market environment can play a role in herd behavior evolution (Tan, Chiang, Mason, & Nelling, 2008). Note also that increased liquidity can be regarded as a positive externality that encourages investors' clustering in a market (Devenow & Welch, 1996). Taylor (2002), however, argues that since asymmetric information is more prevalent in less liquid assets it may be expected that investors will follow the actions of other investors when trading in less liquid stocks.

Secondly, we conduct a comparative study for major international markets and for a large number of stocks that represent a significant percentage of global equity market capitalization. More precisely, for the empirical analysis we employ daily equity prices for the G5 equity markets (France, Germany Japan, UK, and the US), i.e. we use index constituent stocks for the CAC, the DAX, the NIKKEI, the FTSE, and for the S&P, for the period between January 2000 and January 2015. The comparative aspect of the study is important with respect to herd behavior since the

[1] For instance, Sias (2004) finds that institutional investors are less likely to herd when liquidity improves, while Poon, Rockinger, and Stathopoulos (2013) find that bid–ask spreads and liquidity risk increase with institutional sell-side herding during the subprime financial crisis. Also, Wermers (1999) suggests that institutional investors may not prefer assets with lower liquidity; their increased need of funds for liquidity may result to an aversion for smaller stocks that are typically less liquid.

* Corresponding author at: Department of Accounting & Finance, Athens University of Economics and Business, Patision 76, 10434 Athens, Greece.
E-mail addresses: egalariotis@audencia.com (E.C. Galariotis), stkrokida@aueb.gr (S.-I. Krokida), sspyrou@aueb.gr (S.I. Spyrou).

http://dx.doi.org/10.1016/j.irfa.2016.09.013
1057-5219/

market and economic environment may be different between the sample markets. For instance, there are important regulatory differences with respect to the use of derivatives and leverage by funds (Gałkiewicz, 2015) and short selling restrictions (Beber & Pagano, 2010). In addition, central banks adopted different unconventional monetary policies to deal with the global financial crisis and the EU crisis: while the Fed (and the Bank of England) responded to the 2008–2009 crisis with Quantitative easing policies that signaled a will to undertake credit risk, the European Central Bank responded to the EU crisis with an approach that was also targeted at minimizing its own risk (Gros, Alcidi, & Giovanni, 2012).

Another motivation for a comparative multi-market study rather than a single-market study is that we want to investigate whether the drivers of herd behavior are country and sub-period specific, as suggested in previous studies. For instance, Galariotis Rong, and Spyrou (2015) find significant differences not only between the two markets but also between different sub-periods. In the US herd behavior seems due to both fundamental and non-fundamental information while in the UK the evidence indicates fundamental-driven herding and only during the Dotcom bubble burst.

Thirdly, note that liquidity may also proxy for market sentiment, and thus our results may be viewed under this light as well. For example, Baker and Stein (2004) point out that, in a market with short-sales constraints, liquidity can be a sentiment indicator, i.e. an indicator of the presence (or absence) of irrational investors in the market. For example, high liquidity may indicate that the sentiment of irrational investors is positive. Liquidity is also one of the factors that are employed to generate a sentiment index in Baker and Wurgler (2006), who then show that investor sentiment may have a significant impact on the cross-section of stock prices. Tetlock (2007) examines the daily content of a popular column in the Wall Street Journal and finds, among other things, a link between investor sentiment and liquidity in the sense that unusually high or low pessimism seem to predict high market trading volume. Deuskar (2007) argues that markets are more liquid when the current stock return and investor sentiment are higher, while Deuskar (2008) shows that, for NYSE and NASDAQ stocks, illiquidity is lower when investor sentiment is high. Da, Liu, and Schaumburg (2013) find that both liquidity shocks and investor sentiment contribute to the observed short-term reversals, while Brennan and Wang (2007) also argue that market liquidity and sentiment are variables that have common effects on stock prices. In order to measure liquidity we use the Amihud (2002) illiquidity measure for each sample stock, since this measure is widely used in the literature and has been shown to be an effective and reliable proxy of the price impact (Goyenko, Holden, & Trzcinka, 2009); we then modify the measure according to Karolyi, Lee, and Van Dijk (2012) in order to measure liquidity rather than illiquidity.

To anticipate the results, our initial tests indicate no evidence of herd behavior in any market. When, however, we condition on the liquidity of stocks we find significant evidence of herd behavior for high liquidity stocks for all countries and the majority of the sub periods. The only exception is Germany for which there is weaker evidence of herd behavior (only for high liquidity stocks and only during the crisis). Variance decomposition tests, based on a VAR model, indicate that the variance of the average equity market liquidity is affected by return clustering, especially during the crisis and post-crisis period. This effect is more pronounced for the US market, where about 30% of the variance in average stock market liquidity is due to return clustering, and less pronounced in Germany; in Germany this effect is non-existent. Finally, Granger causality tests suggest a two-way relationship between return clustering and liquidity for all markets. The exception is, again, Germany, for which no relationship is detected. To the extent that liquidity proxies for investor sentiment, our results strongly suggest that herd behavior is more prevalent in high sentiment stocks irrespective of the period and that there may be a two-way relationship between sentiment and herding in major equity markets.

The differences between markets may be due to different regulation in various aspects of equity trading. For instance, Gałkiewicz (2015) argues that, with regard to the use of derivatives and leverage by funds, regulation in the US is less strict than the respective German/EU regulation. For instance, funds in the US have a 33% of net assets limit on direct leverage compared to a 10% in Germany; also, issuer risk is accounted differently. Also there are many differences with respect to the approaches adopted to deal with short selling in the US and the European Union (EU), in the aftermath of the global financial crisis. In the US compliance with short selling regulation started in 2005 when an update of short sale regulation took place since its first adoption in 1938 (and amended several times since 2005); by contrast in the EU a common framework for short selling reporting rules, the Regulation on Short Selling and Certain Aspects of Credit Default Swaps (RSS), came into effect in 2012. As Beber and Pagano (2010) show, regulators in different countries reacted differently to the 2007–2009 crisis and imposed (lifted) bans and short selling restrictions not only at different dates but also to different sets of stocks; short selling rules also exhibited different levels of severity. Note that they also find that bans, among other things, failed to support stock prices, with the exception of financial stocks listed in US exchanges. Elineau (2011) points out that, while in the EU regulators responded to the global financial crisis with an attempt to harmonize short selling rules across EU member states, in the US the Congress did not adopt a specific law or regulation providing instead the Securities and Exchange Commission (SEC) a broad authority to regulate in order to avoid manipulation of short selling. Elineau (2011) discusses a number of differences as regards to short sales. For example, the RSS in the EU specifies that for firms whose stocks are traded in the EU there is a two-tier model that assures transparency of net short positions. This model relies on private notifications to the regulator and disclosures to the public.

By contrast in the US the SEC relies on Self-Regulatory Organizations (SROs) in order to achieve daily web-disclosed transparency for short selling interest (e.g. volume and transactions). The SROs are organizations such as New York Stock Exchange, NYSE Amex NASDAQ Stock Market, etc. The SEC also discloses for all shares aggregate fail-to-deliver data. Also note that in the EU short positions of 0.5% and above in any share admitted to trading on a trading venue must be publically disclosed, while in the US Rule 200 requires that orders must be marked "long," "short," or "short exempt (US Securities & Exchange Commission; http://www.sec.gov/investor/pubs/regsho.htm). The rest of the paper is organized as follows. Section 2 briefly discusses the relevant literature; Section 3 presents the data and methodology, Section 4 presents the results, while Section 5 concludes the paper.

2. A brief review of previous studies

A large body of the herding literature (for a detailed review, see Spyrou, 2013) is dedicated to the study of price data and utilizes rational asset pricing as a benchmark to the detect deviations from rationality (Chang et al., 2000). In early representative studies, Christie and Huang (1995) and Chang et al. (2000) argue that herding can be identified by using a measure of cross-sectional dispersion of equity returns. Hwang and Salmon (2004) develop another herding measure that focuses on the cross-sectional dispersion of betas. They study the US and South Korean markets and find herding behavior irrespective of the state of the market and macroeconomic data. Caparrelli, D'Arcangelis, and Cassuto (2004) use these methodologies and find evidence of herding during extreme market conditions in the Italian stock market, while Chiang and Zheng (2010) using data from 18 countries find evidence of herding in advanced and Asian stock markets and spillover effects. Economou, Kostakis, and Philippas (2011) find intensified herding effects during crisis periods for a sample of Southern European markets, a result consistent with Klein (2013) who, using a Markov Switching (SUR) model, documents herding behavior and intensified herding spillover effects across markets during periods of high volatility. Results also suggest that herd behavior may be due to investors reacting to fundamental information: Galariotis Rong, and Spyrou (2015) examine US