**Herd Behavior: A Survey**

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**Abstract**

We present a survey of the extant research on herding, from both a theoretical and an empirical perspective. Overall, theoretical research has endowed us with valuable insights into the key motives underlying investors’ tendencies to herd, while empirical evidence confirms the presence of herding – to varying degrees – internationally, both at the market level and for specific investor types. Future research needs to focus more on the empirical testing for herding intent, herding dynamics at high frequencies and other (non-equity) asset classes, who follows whom in the stock market, and whether herding can be profitably exploited.

**1. Introduction**

Herding as a behavioural trait of investors in capital markets has been identified persistently throughout the centuries, with its presence documented since the early stages of evolution of the world’s first stock exchanges. Indeed, the earliest known direct reference to its existence can be traced back to 1688, when Joseph de la Vega published his work “Confusion de Confusiones”[[1]](#footnote-1) based on anecdotal evidence from the 17th century Amsterdam stock exchange, shortly after the collapse of the Tulip bubble that had rippled the Netherlands in the late 1630s. The 18th century furnished us with some of the world’s most famous bubbles blamed on herd instincts, coming this time from the London (South Seas Bubble) and Paris (Mississippi Bubble) stock exchanges, while the wider launch of stock markets internationally from the 19th century onwards saw the advent of herd behaviour across several of them during various financial episodes (Galbraith, 1994). Although herding as a topic has pre-occupied primarily the popular finance literature over the years, academic research on its premises began to unfold more potently from the 1990s onwards, motivated significantly by the notably high frequency of financial crises (1997 Asian crisis; Dot Com bubble-crash; 2008 global credit crisis) as a result of the accelerated process of globalization that enhanced linkages among financial markets internationally post-1990.

The tremendous wealth of research on herding to date, both at an analytical and an empirical level, has allowed us novel insights into this behavioural pattern. Evidence from analytical studies, for example, has yielded useful insights into the theoretical factors driving the propensity to herd among economic agents of varying degrees of rationality operating in hypothetical market settings characterized by various institutional features (see the excellent review by Hirshleifer and Teoh, 2003). Empirical research, based on the methodologies proposed during the 1992-2004 period has endowed us with a wide cross section of evidence pertaining to various market classifications (developed; emerging; frontier) and investors’ types (retail; institutional). On a more practical side, herding has been found to exhibit regular patterns, include size and industry effects, as well as asymmetric properties conditional upon differential market states (e.g. rising/declining market returns/volatility/volume etc), while there is evidence to suggest it is not entirely unrelated to the momentum trading of institutional investors.

Our survey shall delineate the above, in order to allow the reader an integrated picture of the key issues surrounding herding research to date. Section 2 will discuss the main factors driving the propensity of individuals to mimic their peers in stock markets and section 3 will analyze the key empirical patterns that herding has been shown to entail in the extant research. Section 4 will conclude with a discussion on research questions that have yet to be answered and offer an overview of the likely future of herding research.

**2. Herd Behavior: Theoretical Perspectives**

Herding involves imitation following interactive observation of actions or outcomes of those actions (Hirshleifer and Teoh, 2003). As a result, when one herds in the stock market, s/he copies the trades of others, irrespective of whether her/his information dictated an alternative course of action or s/he had no information from the outset. The issue, therefore, is not whether s/he herds but rather, why. Research to date (Bikhchandani and Sharma, 2000; Holmes et al., 2013; Gavriilidis et al., 2013; Economou et al., 2015b; Galariotis, et al., 2015) has attempted to answer this question by proposing a dichotomous typology of herding, distinguishing between “intentional” and “spurious” herding.

Intentional herding, overall, involves imitation motivated by the expectation of some benefit accruing from it and is normally encountered in situations where there exists some kind of asymmetry, be it actual or perceived. In other words, investors mimic their peers in anticipation of a payoff they could not themselves realize in the absence of imitation (i.e. based on their own merit or information). Research has identified two distinct types of payoffs capable of driving intentional herding: informational and professional ones.

*Informational* payoffs motivate herding when investors believe themselves to be in a state of informational disadvantage vis-à-vis their peers, hence opting for copying the latter’s trades in order to free-ride on their informational content (Devenow and Welch, 1996). The source of this disadvantage could be traced either in the low quality of investors’ information or their lack of information processing skills versus those counterparts of theirs they perceive as better informed. From the moment investors choose to sideline their private signals in favor of imitating the actions of others, this can give rise to temporary blockages of information, whereby investors trade in a given direction because their predecessors did so as well (irrespective of whether these predecessors traded based on information or not). This is clearly detrimental for a market’s informational efficiency; indeed, if one assumes an efficient market to be one in which prices reflect all available information at any point in time over time (Fama 1991), herding obviously deters (or, at best, delays) the incorporation of information into prices, thus leading to the creation of a backlog of “hidden” information and rendering the public information pool poorer (Lee, 1998). If enough investors opt for such behaviour, this can lead to trading trends being set in motion on the basis of very little information, thus triggering the emergence of informational cascades (Banerjee, 1992; Bikhchandani et al., 1992). The latter tend to be characterized by path-dependence, since the actions of the first few movers can shape the trajectory of the followers’ trades; however, this also renders them very fragile, since the arrival of little new information in the market can dislodge the (equally little) information upon which they were founded in the first place (Lee, 1998; Moscarini et al., 1998). Cascades are facilitated by the presence of options that are discrete (Vives, 1993) and limited, as both features make it more likely that investors will eventually converge to one of them. Occasionally, cascading is a function of information-collection incentives. The higher the cost of information, the more likely it is that investors will choose to infer the information from the trades of those they consider informed, rather than pay to acquire it. If observing the trades of others is not possible, observational learning can rely on statistical summary gauges; historical prices are a good example here, as they provide investors with a (noisy) summary indicator of past aggregate market activity. Vives (1993) and Cao and Hirshleifer (1997) have demonstrated how the sequence of historical prices allows investors indirect inference of their peers’ trades at the aggregate level, thus removing the necessity – and the concomitant cost involved - of having to observe their peers’ actions directly. Joining a cascade is also encouraged by the limits of human cognition, in particular, limits to attention and processing (Hirshleifer et al., 2001), since environments rich in information signals can render the observation and deciphering of information arduous for the average investor, who may deem it easier to focus on the trades of others as a means of resolving the complexity in the informational environment.

*Professional payoffs* are a key driver of the herding documented among investment professionals, such as fund managers and financial analysts. The crux of the argument here is that investment professionals’ performance is assessed in relative terms (i.e. versus the performance of their peers), leading them to monitor their peers’ actions closely in order to avoid falling behind the industry average, since any underperformance can negatively affect their professional prospects (Scharfstein and Stein, 1990). A low-skilled (“bad”) fund manager, for instance, would prefer to mimic the trades of a highly skilled “(good”) fund manager with the purpose of generating the impression to his assessors that he is highly skilled as well. The actions of the “bad” manager in this case stem from three factors: a subjective uncertainty as per each manager’s skills (perfect knowledge on his skills is not possible for his assessors); an objective asymmetry (he knowingly lacks the skills of his “good” counterparts); and an equally objective risk aversion (his relative underperformance can be readily verified, thus compromising his professional future). Taken together, the above fuel his herding intent and this is particularly important during periods of market downturns where the likelihood of losses is greater, since a “bad” manager can then claim that he made the same trades as his “good” peers (in effect claiming that he is of equally high ability) and blame his losses on the overall adverse state of the market. Such imitative intent can, however, also exist during rising markets, since underperforming during bullish periods can help reveal a “bad” manager’s low ability. Research to date has identified two types of professional payoffs as motivating factors underlying intentional herding: reputation and compensation schemes. Highly reputed professionals will choose to imitate their peers in order to protect their reputation when having to make a decision (Graham, 1999); this is because, if the decision proves wrong, the damage to their reputation will exceed any reputational benefits in case of a correct decision. However, weakly reputed investment professionals are also susceptible to herding, since, by doing so they can free-ride on the (presumably better) skills of their well-reputed peers (Trueman, 1994; Welch, 2000; Clement and Tse, 2005). Compensation schemes, on the other hand, have been shown (Chevallier and Ellison, 1999; Graham, 1999) to be important in determining whether investment professionals will opt for herding or choose to utilize their private signals.

Turning now to *spurious* herding, this occurs when investors exhibit similar reactions to commonly observed signals. In this case, investors’ trades exhibit correlation, without the latter stemming from investors actually observing each other (i.e. without herding actually taking place); rather it is the presence of an (endogenous or exogenous) factor to which they are all commonly exposed that motivates similarity in their trades. There are two main sources of spurious herding, *relative homogeneity* and *characteristic trading*. Relative homogeneity refers to the presence of features that enhance commonality among investment professionals and which prompt them to generate similar responses (De Bondt and Teh, 1997). Fund managers, for example, tend to possess similar educational backgrounds and professional qualifications and they also tend to investigate similar indicators (macroeconomic, financial etc), which they also tend to interpret in similar fashion (Froot et al., 1992; Hirshleifer et al., 1994)[[2]](#footnote-2). Another factor that has been found to promote homogeneity in the trades of investment professionals is the regulatory framework to which they are subject. Evidence, for example, from emerging markets[[3]](#footnote-3)’ pension funds (Voronkova and Bohl, 2005; Olivares, 2008) has indicated that their institutional framework imposes strict minimum performance requirements, which, coupled with profiling restrictions in the stocks in which they are allowed to invest, leads them to hold very similar portfolios.

Spurious herding can also be the product of the similar investment strategies employed by professional investors. Fund managers have been found to be very prone to utilizing characteristic trading in their conduct (Bennett et al., 2003); the term “characteristic trading” refers to strategies opting for stocks bearing specific characteristics and is also known as “style investing”. Examples of such characteristics include past performance (momentum and contrarian strategies), fundamental pricing (value and growth strategies), industry classification (sector strategies), capitalization (size strategies) and religious-ethical precepts (ethical investing and Shariah-compliant strategies). If several institutional investors pursue a specific strategy, then their trades will exhibit correlation, without any need for interactive observation; the sheer fact that they all adhere to the same style of investment is enough to generate the impression of herding, without herding actually being at works. In particular, evidence from a variety of studies (Grinblatt et al., 1995; Choe et al., 1999; Nofsinger and Sias, 1999; Wermers, 1999; Sias, 2004; Choi and Sias, 2009) has denoted that fund managers are attracted to momentum trading (“trend-chasing”) while herding at the same time, with the relationship, however, between herding and momentum trading not being consistently found to exhibit significance. It is reasonable to expect that the wide popularity of momentum trading among institutional investors would suggest that they would tend to buy (sell) similar winners (losers) over time, thus generating the impression that they are herding. However, as mentioned above, herding presupposes interactive observation, with the latter being far from necessary among investors using the same strategy; any similarity in their trades is merely the result of their common exposure to the same strategy they employ.

Less-than-perfectly rational factors have been found to be relevant to herding, either in conjunction with the above mentioned intentional/spurious ones or in isolation. A typical example here relates to behavioural forces, including the availability heuristic and home bias. Investors, for example, have been found to depict greater preference towards investing in stocks whose underlying companies’ headquarters lie in close proximity to their home, with the portfolios of most investors being heavily tilted towards their home market’s stocks (home bias). Such a tendency has been found (see e.g. Seasholes and Zhu, 2010) to amplify the correlation in trades among “home biased” investors. Kuran and Sunstein (1999) have linked home-bias to informational reasons related to within-community dynamics. The issue here is that a community (social or professional) encourages preference towards home-stocks (being “home”, they are better-known), thus leading the community’s pool of information to be dominated by news regarding these stocks only, with this availability bias tacitly prompting investors to participate in an availability cascade of preferences towards home-stocks (Andrikopoulos et al., 2014). Home-bias can further be reinforced by other psychological vehicles, including familiarity bias (investors choosing stocks appearing more familiar to them – see Huberman, 2001), recognition heuristic (investors choosing stocks with higher recognisability – see Boyd, 2001) and conformity (a community can enhance the tendency among its members to conform to the norm – see Hirshleifer, 2001).

The discussion so far has demonstrated that, although herding *per se* may appear like a straightforward activity, its roots and causes are rather versatile. Motivated by these theoretical considerations – and by the enhanced frequency of financial crises over the past two decades – a series of studies have been devoted to the empirical investigation of herding, in order to assert its existence, its patterns and the effect it has over capital markets, and we will now turn to present a more detailed overview of the extant empirical evidence of the herding literature.

**3. Herd Behavior: Empirical Evidence**

Herding is perhaps one of the most widely empirically researched areas of behavioural finance, with herding studies normally relying on one of two types of data, namely *aggregate data* (such as prices and volume) and *microdata* (proprietary data on investors’ accounts, portfolios and transactions). Empirical research in herding grew since the 1990s, following the establishment of the herding measures by Lakonishok et al. (1992) and Christie and Huang (1995). The Lakonishok et al. (1992) model hinged on measuring the herding of market participants at the micro level (the authors used US funds’ portfolio data as input) and provided a picture of herding within a period based on the cross sectional fraction of buyers (i.e. funds increasing their position in stocks within a period). Sias (2004) improved on that measure, testing directly for the inter temporal (period-on-period) dependence of the cross sectional institutional demand; he then decomposed the cross sectional correlation of this demand into two parts, one pertaining to habit investing (funds following their past trades) and one reflecting herding (funds following the trades of other funds). At the macro (aggregate) level, Christie and Huang (1995) proposed a model based on the relationship between the cross sectional dispersion of returns and extreme market returns; regressing the former on the latter, they aimed at testing whether herding could be reflected in a negative relationship between the two. The reason for that is that herding in the market would lead individual equity returns to cluster more closely around the market’s average, hence leading to a reduction in their cross sectional deviation. However, their model entailed a linear regression design, thus being unable to capture potential non linearities in that relationship, more so considering evidence (e.g. Lux, 1995) linking herding with non linear dynamics in capital markets[[4]](#footnote-4). Chang et al. (2000) incorporated this in their model, which tested simultaneously for both the linear and the non linear relationship between the cross sectional return dispersion and market returns; an additional advantage of their model was that, unlike Christie and Huang (1995), they tested for herding on the premises of the entire market return distribution and not only during extreme return periods. The latest fundamental evolution of Chang et al. (2000)’s model came from Hwang and Salmon (2004), who tested for herding based on the cross section of securities’ factor sensitivities, by extracting herding from the cross section of a market’s stock-betas via a Kalman filter. Despite the methodological design they proposed being econometrically more involved, a key advantage of it is that it allowed us, for the first time, to visualize herding graphically.

Empirical research on herding has allowed us to decipher certain stylized facts regarding herding properties internationally. To begin with, herding appears more significant in emerging compared to developed markets, with this being confirmed by results both at the aggregate and micro level. Fund managers, for example, tend to herd more in markets like Poland (Voronkova and Bohl, 2005), Portugal (Holmes et al., 2013), South Korea (Choe et al., 1999) and Taiwan (Demirer et al., 2010; Hung et al., 2010; Lu et al., 2012), compared to the US (Lakonishok et al., 1992; Grinblatt et al., 1995; Wermers, 1999)[[5]](#footnote-5) or the UK (Wylie, 2005). At the macro level, Chang et al (2000) found significant herding for the emerging, yet not the developed, markets of their sample, while further evidence of emerging market herding has been reported by Chiang et al. (2010), Chiang and Zheng (2010) and Tan et al. (2008). As Gelos and Wei (2005) argued, this needs to be attributed to the relatively lower transparency of emerging markets which renders the quality of public information ambiguous, thus prompting institutional investors to mimic each other when trading there.[[6]](#footnote-6)

Specifically, with respect to institutional herding, mutual funds buy and sell stocks and closely track the herd of hedge funds, with mutual funds having a positive effect to the earlier quarter’s hedge fund herding (Jiao and Ye, 2014). However, Jiao and Ye further argue that hedge funds do not follow mutual funds and hedge funds do not disrupt stock prices, with the top 30% of the most actively traded mutual funds closely following hedge funds, thereby forcing stock price reversals. A notable study by Brunnermeier and Nagel (2004) highlight that, during the Nasdaq bubble, hedge funds did not apply downward pressure on stocks prices but were fully invested in tech stocks and due to their short selling strategies were able to unwind their leveraged positions by minimizing losses and circumventing further declines.[[7]](#footnote-7) Using 13F position reports, Zykaj et al. (2014) claim that there is some herding and crowding in hedge funds, but it is less than that encountered among other institutional investors, with hedge funds rarely participating in momentum trading strategies due to their short selling as well as having different styles than mutual funds. One must understand that hedge fund data is monthly and, due to the high frequency of their trading, said data only allows us insight into a fraction of their trades, more so since the SEC does not require short trades to be disclosed. In addition, hedge funds are known for their performance fee structure, thus having a significantly higher degree of disclosure standards to guard their superior stock selection abilities, investment ideas and marketing timing skills to take advantage of inefficiencies in global markets. However, Zykaj et al. (2014) find that hedge fund herding is not linked to extreme market events or market pressure. On the other hand Ben-David et al. (2011) discovered that hedge funds did herd in the 2008 crisis but 18% less than mutual funds, which is contrary to what the media suggested at the time that hedge funds tended to destabilize markets. In addition, hedge funds are not seen as destabilizing global stock markets but rather hedge fund herding is based on profitable opportunities (Mattes, 2014). Furthermore, Gray (2009) finds that hedge fund herding is not related to money flows. Nevertheless, Boyson (2010) finds that older (senior) hedge fund managers that diverge away from the herd will have a higher likelihood of failure and her findings illustrate that hedge fund managers with more experience herd more than managers with less experience.

Another interesting finding regarding herding internationally is that it manifests itself with a size effect. Many herding studies (Lakonishok et al., 1992; Wermers, 1999; Chang et al., 2000; Sias, 2004; Wylie, 2005; Hung et al., 2010) have reported strong herding among small capitalization stocks; this has been ascribed to these stocks’ greater information risk[[8]](#footnote-8), which thus prompts investors to copy their peers’ trades when trading small stocks in order to tackle their informational predicament. Evidence however, also exists (Wylie, 2005; Kremer and Nautz, 2013) of fund managers herding significantly towards the largest stocks as well in international markets and this is a very interesting finding, considering that large cap stocks do not suffer from the dearth of information plaguing small cap ones. One possible explanation for this is that institutional investors’ performance is often benchmarked against a blue chip index and this prompts them to track that index, thus ending up holding a portfolio whose composition mirrors the index’ one.[[9]](#footnote-9) Apart from the size effect, herding internationally presents us with industry-effects as well, with its significance manifesting itself across various sectors for different markets (Voronkova and Bohl, 2005; Choi and Sias, 2009; Zhou and Lai, 2009; Demirer et al, 2010; Gavriilidis et al., 2013; Gebka and Wohar, 2013).

Another interesting issue is that herding is affected by the outbreak of financial crises, be they local or global. Hwang and Salmon (2004) showed that market-wide herding declined in the US and South Korea following the onset of the Asian crisis (1997-1998), while Choe et al. (1999) found that foreign funds herded less in South Korea following that crisis’ outbreak. However, other studies (Kim and Wei, 2002; Chiang and Zheng, 2010; Mobarek et al., 2014) report a rise in herding following the outbreak of various crises, while Economou et al. (2015b) find mixed evidence on the effect of the 2008 global crisis over institutional herding in Balkan markets. The effect of financial crises over herding might be explained by the fact that crises lead to the unveiling of novel fundamentals, which can both collapse the pre crisis consensus upon which investors herded (the case of herding falling post crises) and give rise to a new consensus upon which investors can herd (the case of herding rising post crises)[[10]](#footnote-10).

Herding has also been found to be induced internationally by US market returns, as recent evidence by Chiang and Zheng (2010) and Economou et al. (2015a) indicates, while the CBOE VIX index[[11]](#footnote-11) (also known as the “fear index”) has also been found to motivate herding both within and outside the US (Chiang et al., 2013; Philippas et al., 2013). Such an effect is perhaps to be expected, considering the pivotal role of US stock markets in the global financial system.

Perhaps the most persistent finding in the herding literature is that herding is asymmetric in equity markets, with its significance varying across different states of the market. A wealth of studies have conditioned herding upon variables such as market returns, market volatility and market volume, with results overwhelmingly confirming that herding varies with market conditions. This variation is by no means uniform across capital markets; herding has been found to be significant during periods with negative market returns (Goodfellow et al., 2009; Zhou and Lai, 2009; Demirer et al., 2010; Economou et al., 2011; Holmes et al., 2013; Gavriilidis et al., 2013), positive market returns (Economou et al., 2015a; Economou et al., 2015b), low or decreasing volatility (Economou et al., 2011; Holmes et al., 2013; Economou et al., 2015b), high volatility (Blasco et al., 2012; Economou et al., 2015b), high or rising volume (Gavriilidis et al., 2013; Economou et al., 2015b) and low volume (Tan et al., 2008; Economou et al., 2011). Other studies have produced evidence against the presence of asymmetric herding (Chang et al., 2000; Caparelli et al., 2004) and others (Chiang and Zheng, 2010; Chiang et al., 2010; Chiang et al., 2013) have produced mixed evidence in that respect.

Aside from the extant evidence on institutional investors’ herding, retail investors’ behaviour has also been studied, with evidence to date (Kumar and Lee 2006; Dorn et al. 2008; Kaniel et al., 2008; Kumar 2009; Barber et al., 2009a; 2009b) suggesting the presence of pronounced herding in that segment. This is a very promising area of research, since individual investors’ herding can be examined using both empirical as well as experimental approaches (through experiments in controlled environments, something very hard in the case of institutional investors). Perhaps the biggest obstacle faced by those researching retail herding is data-availability; whereas institutional holdings’ databases are occasionally available due to disclosure requirements, retail trades/portfolios are much harder to attain as they are considered private data and are, thus less likely to be shared by their proprietors (e.g. banks, brokers etc).

Finally, a promising area of research is the one attempting to decipher whether herding is intentional or spurious. Evidence on this mainly stems from microdata studies at the market (Holmes et al., 2013; Economou et al., 2015b) and industry level (Gavriilidis et al., 2013); basing the detection of herding intent on the interaction between herding and market/sector conditions, the above studies have denoted that fund managers herd intentionally in various markets. The seminal attempt to address this issue at the market level was by Galariotis et al. (2015), who identified herding intent by extracting the fundamentals-driven component from the cross sectional dispersion of returns in the Chang et al. (2000) model. The advantage of these studies is that they push the frontier of research beyond testing whether herding exists or not towards identifying what motivates herding.

**Conclusion**

Research on herding has been voluminous since the early 1990s and has endowed us with plenty of insights into what motivates herding theoretically as well as whether investors herd internationally. In this part we will focus on what remains to be desired from herding research as it unfolds in the future. First of all, although we know much about why investors herd in theory, our empirical evidence on this is rather scarce, aside from the few studies mentioned above on intentional versus spurious herding. Whether institutional herding, for example, is the product of intent or the outcome of fund managers’ spuriously synchronized trades is important, both for regulators (herding can potentially destabilize stock markets) and investors in mutual funds (herding constitutes an undeclared passive investment strategy that may lead to sub-optimal portfolio structures for these funds’ investors; Economou et al., 2015b). Second, it is worth noting that we are still lacking a model enabling us to identify exactly who follows whom in capital markets; although herding reflects the concept of people following each other, the latter is something that cannot be readily verified with the models at hand to date. Third, the advent of algorithmic/high frequency trading during the past decade or two, poses interesting questions as per the herding dynamics at high and ultra-high frequencies, an issue that has received very little attention to date[[12]](#footnote-12). Fourth, although most evidence on herding emanates from equity markets, relatively less is known about herding in other asset classes, such as bonds, exchange-traded funds, derivatives and currencies[[13]](#footnote-13); it would be interesting to see more research on those instruments, given their structural and clientele (institutional investors almost overwhelmingly dominate their trading) differences compared to equities. Finally, it would be very interesting to assess whether herding could be exploited profitably, more so given earlier research (De Long et al., 1990) on rational speculators profiting at the expense of noise traders. Admittedly, the issue here is to come up with a herding measure allowing us the identification of herding as a discrete or continuous variable for forecasting purposes; the Hwang and Salmon (2004) model goes some way in satisfying this condition (it allows for herding to be extracted as a time series and portrayed graphically), yet at low (monthly) frequencies, which are not attractive for professional investors, whose trades are conducted at higher frequencies. It is likely that many of the above issues shall be addressed in the near future, if both new empirical designs and – most importantly – more sophisticated databases (allowing greater identification of who is trading at the tick level) will be developed.

**References**

Andrikopoulos P, Hoefer A, Kallinterakis V (2014) On the impact of market mergers over herding: Evidence from Euronext. Rev Behav Financ 6:104-135

Banerjee, A.V. (1992), “A simple model of herd behavior”, *Quarterly Journal of Economics*, Vol. 107 No. 3, pp. 797-817.

Barber, B. M., Odean, T. and Zhu, N. (2009a). "Systematic noise." Journal of Financial Markets, Vol. 12 (4), pp.: 547-569.

Barber, B., Odean, T., Zhu, N., 2009b. Do retail trades move markets? Review of Financial

Studies 22, 151–186.

Barras, L., Scaillet, O., and Wermers, R., 2010. False discoveries in mutual fund performance:

measuring luck in estimated alphas. Journal of Finance, 65(1), 179-216.

Ben-David, . I., Franzoni, F. A. and Moussawi, R. Hedge Fund Stock Trading in the Financial Crisis of 2007-2009 (September 14, 2011). AFA 2011 Denver Meetings Paper; Fisher College of Business Working Paper No. 2010-03-002; Swiss Finance Institute Research Paper No. 11-08. Available at SSRN: [http://ssrn.com/abstract=1550240](http://ssrn.com/abstract%3D1550240) or <http://dx.doi.org/10.2139/ssrn.1550240>

Bennett JR, Sias R, Starks L (2003) Greener pastures and the impact of dynamic institutional preferences. Rev Financ Stud 16:1203-1238

Bikhchandani, S., Hirshleifer, D. and Welch, I. (1992), “A theory of fads, fashion, custom, and cultural change as informational cascades”, *Journal of Political Economy*, Vol. 100 No. 5, pp. 992-1026.

Bikhchandani S. and Sharma, S. (2000), “Herd behavior in financial markets”, *IMF Staff Papers*,Vol. 47 No. 3, pp. 279-310.

Blasco N, Corredor P, Ferreruela S (2011) Market sentiment: A key factor of investors’ imitative behaviour. Account Financ 52:663-689

Blasco N, Corredor P, Ferreruela S (2012) Does herding affect volatility? Implications for the Spanish stock market. Quant Financ 12:311-327

Borio, C. (2008), “The financial turmoil of 2007-?: A preliminary assessment and some policy considerations”, working Paper 251, Bank for International Settlements, Monetary and Economic Department, Basel – Switzerland.

Boyd, M. (2001). " On Ignorance, Intuition, and Investing: A Bear Market Test of the Recognition Heuristic", *Journal of Psychology and Financial Market*s, Vol. 2 (3), pp. 150-156.

Boyson, N. Implicit incentives and reputational herding by hedge fund managers.” Journal of Empirical Finance, 17 (2010) 283–299

Brunnermeier, M.K. and Nagel, S. “Hedge Funds and the Technology Bubble.” Journal of Finance, 59(5), 2013-2040.

Cai, F., Han, S. and Li, D., 2012, Institutional Herding in the Corporate Bond Market, Board of Governors of the Federal Reserve System International Finance Discussion Papers Number 1071 December 2012.

Cao, H. H. and Hirshleifer, D. (1997), “Limited observability, reporting biases, and informational cascades”, working paper, Fisher College of Business, Ohio State University.

Carpenter, Andrew and Jianxin Wang (2007), “Herding and Information Content of Trades in Foreign Exchange Market,” Pacific-Basin Finance Journal, 15(2), 173- 194.

Chang, E.C., Cheng, J.W., Khorana, A., 2000. An examination of herd behavior in equity markets: An international perspective. Journal of Banking and Finance 24, 1651-1679.

Chen, H-C, Ho, J-K, Lai, C.W. and Morales-Camargo, E. (2012) “Institutional trading behaviour in the ETF market”, Working Paper, Anderson School of Management, University of New Mexico.

Chevalier, J., and G. Ellison. 1999. Career concerns of mutual fund managers. *Quarterly Journal of Economics* 114, no. 2:389–432.

Chiang, T.C., Zheng, D., 2010. An empirical analysis of herd behavior in global stock

markets. Journal of Banking and Finance 34, 1911–1921.

Chiang, T.C., Li, J., Tan, L., 2010. Empirical investigation of herding behavior in Chinese

stock markets: evidence from quantile regression analysis. Global Finance Journal, 21, 111

124.

Chiang, T., Tan, L., Li, J., Nelling, E., 2013. Dynamic herding behavior in Pacific-Basin markets: evidence and implications. Multinatl. Financ. J. 17, 165–200.

Choe H, Kho BC, Stulz RM (1999) Do foreign investors destabilize stock markets? The Korean experience in 1997. J Financ Econ 54:227-264

Choi, N. and Sias, R.W. (2009), “Institutional industry herding”, *Journal of Financial Economics*, Vol. 94 No. 3, pp. 469-491.

Clement, M.B., Tse, S. Y., 2005. Financial Analyst Characteristics and Herding Behaviour in Forecasting. The Journal of Finance 60: 307-341.

Christie, W.G., Huang, R.D., 1995. Following the pied piper: do individual returns herd around the market? Financial Analysts Journal 51, 31-37.

De Bondt, W.F.M., Teh, L.L., 1997. Herding behavior and stock returns: an exploratory investigation. Swiss Journal of Economics and Statistics 133, 293-324.

De Long, J.B., A. Shleifer, L.H. Summers and R.J. Waldmann (1990). “Positive Feedback Investment Strategies and Destabilizing Rational Speculation”. *Journal of Finance* 45 (2), 379-395.

Demirer, R., Kutan, A. M., Chen, C-D., 2010. Do investors herd in emerging stock markets?

Evidence from the Taiwanese market. Journal of Economic Behavior and Organizations 76,

283-295.

Devenow, A. and Welch, I. (1996), “Rational herding in financial economics”, *European Economic Review*, Vol. 40, No. 3-5, pp. 603-615.

Dorn D, Huberman G, Sengmueller P (2008) Correlated trading and returns. J Financ 63:885-920

Economou, F., Gavriilidis, K., Kallinterakis, V., Goyal, A., 2015a. Herding dynamics in

exchange groups: evidence from Euronext. Journal of International Financial Markets,

Institutions and Money, 34, 228-244.

Economou, F., Gavriilidis, K., Kallinterakis, V., and Yordanov, N., 2015b. Do fund managers herd in frontier markets-and why? International Review of Financial Analysis, 40, 76-87.

Fama, E.F. (1991). “Efficient Capital Markets II”. *Journal of Finance* 46 (5), 1575-1617.

Froot, K., D. Scharfstein, and J. C. Stein, 1992. Herd on the street: informational

inefficiencies in a market with short-term speculation, Journal of Finance 47, 1461-1484.

Galariotis, E., Rong, W., Spyrou, S., 2015. Herding on fundamental information: a

comparative study. Journal of Banking and Finance, 50, 589-598.

Galariotis, E., Krokida, I.-S., Spyrou, S., forthcoming, Bond Market Investor Herding:

Evidence from the European Financial Crisis. *International Review of Financial Analysis*

Galbraith, J. K. (1994) A Short History of Financial Euphoria, Penguin Books

Gavriilidis, K., Kallinterakis, V., Leite-Ferreira, M.P., 2013. Institutional industry herding: Intentional or spurious? Journal of International Financial Markets, Institutions and Money, 26, 192-214.

Gebka, B., Wohar, M.E., 2013. International herding: does it differ across sectors? Journal of

International Financial Markets, Institutions and Money, 23, 55-84.

Gelos, R.G., Wei, S.-J., 2005. Transparency and international portfolio holdings. Journal of

Finance, 60, 2987-3020.

Gleason, K.C., Lee C.I., Mathur, I., 2003. Herding behavior in European futures markets. Finance Letters 1, 5-8

Gleason KC, Mathur I, Peterson MA (2004) Analysis of intraday herding behaviour among the sector ETFs. J Emp Financ 11:681-694

Goodfellow, C., Bohl, M., Gebka, B., 2009. Together we invest? Individual and institutional

investors’ trading behavior in Poland. International Review of Financial Analysis, 18, 212

221.

Graham, J.R. (1999), “Herding among investment newsletters: theory and evidence”, *Journal of Finance*, Vol. 54 No. 1, pp. 237.268.

Gray, W. R. (2009). Do hedge fund managers identify and share pro\_table ideas? Working

Paper, University of Chicago.

Grinblatt, M., S. Titman, and R. Wermers. 1995. Momentum investment strategies, portfolio performance, and herding: a study of mutual fund behavior. *American Economic Review* 85, no. 5:1088–105.

Henker J, Henker T, Mitsios A (2006) Do investors herd intraday in Australian equities? Int J Managerial Finance 2:196-219

Hirshleifer, D. (2001), “Investor psychology and asset pricing”, *Journal of Finance*, Vol. 56 No. 4, pp. 1533-1598.

Hirshleifer, D. and Teoh, S.T. (2003), “Herd behavior and cascading in capital markets: a review and synthesis”, *European Financial Management*,Vol. 9 No. 1, pp. 25-66.

Hirshleifer, D., A. Subrahmanyam, and S. Titman, 1994, Security analysis and trading

patterns when some investors receive information before others, Journal of Finance, 49,

1665-1698.

Holmes, P.R., Kallinterakis, V. and Leite-Ferreira, M.P. (2013), “Herding in a concentrated market: A question of intent”, *European Financial Management*, Vol. 19, No. 3, pp. 497-520.

Huberman, G. (2001), “Familiarity breeds investment”, *Review of Financial Studies*,Vol. 14 No. 3, pp. 659-680.

Hung W., C.-C. Lu and C.F. Lee, 2010. Mutual fund herding and its impact on stock returns:

evidence from the Taiwan stock market, Pacific-Basin Finance Journal, 18, 477-493.

Hwang, S., Salmon, M., 2004. Market stress and herding. Journal of Empirical Finance 11, 585-616.

Jiao, Y. and Ye, P. (2014). Mutual fund herding in response to hedge fund herding and the impacts on stock prices, Journal of Banking and Finance, Vol. 49, 131-148.

Kaniel, R., Saar, G., Titman, S., 2008. Individual investor trading and stock returns. Journal of Finance 63, 1437–1467.

Kim,W., Wei, S.J., 2002. Foreign portfolio investors before and during a crisis. J. Int. Econ. 56, 77–96.

Kodres, L. E. and M. Pritsker, 1997, Directionally similar position taking and herding by large futures market participants, Working paper, IMF and Board of Governors of the Federal Reserve System.

Kumar A, Lee CMC (2006) Retail investor sentiment and return comovements. J Financ 61:2451–2486

Kumar A (2009) Dynamic Style Preferences of Individual Investors and Stock Returns. J Financ Quant Anal 44:607-640

Kuran, T. and Sunstein, C. (1999), “Availability cascades and risk regulation”, *Stanford Law Review*, Vol. 51 No. 4, pp. 683-768.

Lakonishok, J., Shleifer, A., Vishny, R., 1992. The impact of institutional trading on stock prices. Journal of Financial Economics 32, 23-43.

Lee, I.H. (1998), “Market crashes and informational avalanches”, *Review of Economic Studies*, Vol. 65 No. 4, pp. 741-759.

Lu, Y.-C., H. Fan and C.-C. Nieh, 2012. The price impact of foreign institutional herding on

large-size stocks in the Taiwan stock market. Review of Quantitative Finance and

Accounting, 39, 189-208.

Lux, T. (1995), “Herd Behaviour, Bubbles and Crashes”, The Economic Journal, Vol. 105, pp. 881-896.

Mattes, A. Three Essays on Hedge Fund Risk Taking, Hedge Fund Herding, and

Audit Experts Dissertation submitted for the degree of Doctor of Economics, University of Konstanz, Germany.July 2, 2014.

Mobarek, A., Mollah, S., Keasey, K., 2014. A cross-country analysis of herd behavior in Europe. J. Int. Financ. Mark. Inst. Money 32, 107–127.

Moscarini, M., Ottaviani, M. and Smith, L. (1998), “Social learning in a changing world”, *Economic Theory*, Vol. 13 No. 3, pp. 657-665.

Nofsinger, J. R., Sias, R. W., 1999.Herding and Feedback Trading by Institutional and Individual Investors. The Journal of Finance 54, 2263-2295.

Oehler, A., Chao, G., 2000. Institutional herding in bond markets. Working Paper, Bamberg

University.

Olivares, J.A., 2008. Rear-view-mirror driving in defined contribution systems: the strange

formula of the Chilean pension funds, Applied Economics, 40, 2009-2019.

Philippas, N., Economou, F., Babalos, V., Kostakis, A., 2013. Herding behavior in REITS: Novel tests and the role of financial crisis. Int. Rev. Financ. Anal. 29, 166–174.

Scharfstein, D.S. and Stein, J.C. (1990), “Herd behavior and investment”, *American Economic Review*, Vol. 80 No. 3, pp. 465-479.

Seasholes, M. and Zhu, N. (2010), “Individual investors and local bias”, *Journal of Finance*, Vol. 65 No. 5, pp. 1987-2010.

Sherman, R. 2011. “Herding in the Foreign Exchange Market”, Working Paper, Brandeis University.

Sias, R.W., 2004. Institutional herding. Review of Financial Studies 17, 165-206.

Tan, L., Chiang, T.C., Mason, J.R., Nelling, E., 2008. Herding behavior in Chinese stock

markets: an examination of A and B shares. Pacific Basin Finance Journal, 16, 61-77.

Trueman, B. (1994), “Analyst forecasts and herding behavior”, *Review of Financial Studies*, Vol. 7 No. 1, pp. 97-124.

Vives, X. (1993), “How fast do rational agents learn?”, *Review of Economic Studies*, Vol. 60 No. 2, pp. 329-347.

Voronkova, S. and Bohl, M.T. (2005), “Institutional traders’ behavior in an emerging stock market: Empirical evidence on Polish pension fund investors”, *Journal of Business, Finance and Accounting*, Vol. 32 No. 7&8, pp. 1537-1560.

Walter, A., Weber, M., 2006. Herding in the German mutual fund industry. European

Financial Management 12,375-406.

Weiner, R. 2006. “Do Birds of a Feather Flock Together? Speculator Herding the World Oil Market”, Discussion Paper, 06-31, Resources for the Future

Welch, I., 2000, “Herding Among Security Analysts”, *Journal of Financial Economics*, 58, 369-396.

Wermers, R. (1999), “Mutual fund herding and the impact on stock prices”, *Journal of Finance*, Vol. 54 No. 2, pp. 581-622.

Wylie, S., 2005. Fund manager herding: A test of the accuracy of empirical results using

U.K. data. Journal of Business 78, 381-403.

Zhou, R.T., Lai, R.N., 2009. Herding and information based trading. Journal of Empirical Finance 16, 388–393

Zykaj, B. B., Sias, R. W. and Turtle, H. J., Hedge Fund Crowds and Mispricing (September 5, 2014). Available at SSRN: [http://ssrn.com/abstract=1906932](http://ssrn.com/abstract%3D1906932) or <http://dx.doi.org/10.2139/ssrn.1906932>

1. “Merchant: In this chaos of opinions, which one is the most prudent?

 Shareholder: To go in the direction of the waves and not fight against the powerful currents”

(Joseph de la Vega. “Confusion de Confusiones”, adapted from Corzo et al., 2014) [↑](#footnote-ref-1)
2. The case whereby investors trade similarly because their information sets are positively correlated (i.e. they are employing similar signals) is also known as “investigative herding” (see Sias, 2004). [↑](#footnote-ref-2)
3. The references mentioned here pertain to the well-researched cases of pension funds’ investment behaviour in Chile and Poland. [↑](#footnote-ref-3)
4. It is interesting to note here that herding studies employing the Christie and Huang (1995) model have almost never produced evidence in support of herding, Christie and Huang (1995) included. [↑](#footnote-ref-4)
5. A very interesting issue with regards to the US market is that US fund managers appear to herd more when the Sias (2004) framework is employed, compared to the one by Lakonishok et al. (1992), thus suggesting that different models may capture different types of herding; alternatively, since the Sias (2004) model has been used on data covering more recent periods, this may be due to the increasing fraction of unskilled fund managers in the US market over the past decades, who, due to their lack of skill would be more likely to consider herding (for more on this, see Barras et al., 2010). [↑](#footnote-ref-5)
6. Economou et al. (2015b) have recently produced evidence supporting the presence of herding among fund managers in the category of frontier markets as well, by investigating institutional herding in Bulgaria and Montenegro. [↑](#footnote-ref-6)
7. The Nasdaq Composite Index and Nasdaq 100 Index dropped -67.18% and -73.45% respectively from January 2000 to December 2002, while during the same period the Hedge Fund Research (HFR) Hedge Fund Weighted Composite Index appreciated 8.24%. [↑](#footnote-ref-7)
8. Information risk in small stocks (due to their lack of wider coverage by analysts) leads to lower investors’ attention/interest and, hence, lower volumes. This, in turn, gives rise to higher liquidity risk for small stocks, which can further encourage herding; investors wishing to enter/exit positions in/from illiquid stocks will likely trade as soon as their volume picks up, i.e. when they see other investors trading those stocks. [↑](#footnote-ref-8)
9. Walter and Weber (2006) called this “benchmark” herding. [↑](#footnote-ref-9)
10. For more on this, see Borio (2008). [↑](#footnote-ref-10)
11. The CBOE VIX is an implied volatility index calculated based on the expected volatility of the S&P500 index constituents’ options during the next 30 days; it was launched in 1993. [↑](#footnote-ref-11)
12. Gleason et al. (2004) and Henker et al. (2006) reported no intraday herding for US sector ETFs and the Australian equity market, respectively; on the other hand, Zhou and Lai (2009) showed that investors herded significantly intra-daily in Hong Kong equities, particularly towards a) small capitalization stocks, b) the sell-side and c) when the market slumped, while significant intraday herding was also reported by Blasco et al. (2011; 2012) for the Spanish equity market. [↑](#footnote-ref-12)
13. Bond herding has been investigated by Oehler and Chao (2000), Cai et al. (2012) and Galariotis et al. (forthcoming), herding in the futures’ market has been investigated by Kodres and Pritsker (1997), Gleason et al. (2003) and Weiner (2006), herding in ETFs has been tested for the first time by Chen et al. (2012) and herding in the currency market has been investigated by Carpenter and Wang (2006) and Sherman (2011). [↑](#footnote-ref-13)