

Herding Behavior in Pakistani Financial Markets: A Study of Behavioral Finance

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Abstract

This paper examines herd behavior in Pakistan stock market using data from the Pakistan Stock Exchange. We test for the presence of herding as suggested by Hwang and Salmon (2004) Model. Results based on monthly data indicate the existence of herd behavior for the years 2013-2018. Evidence of little herd behavior is found during the whole period except in the last months of December, 2012 where more herding practices are being observed in Pakistan Stock Exchange. While investigating the herd behavior using sector wise data, we found that cement industry shows more herding as compared to others sectors.

Key Words: Behavioral Finance, Herding Behavior, Pakistan Stock Exchange

Introduction

Herding behavior is one of the main phenomena in financial markets. Traditionally herding behavior is related to irrational decision making. Herding seems when a group of people / investors follow the trend without a planned direction and they follow the actions or movements of the market participants instead of following their own beliefs or actions. It happens when the investor have the lack of decision making authority and thoughtfulness. This is because of the fact that they have not the ability to process the information and does not link the prices with their fundamental values. Hence, there is uncertainty/financial crisis in the markets, which is often impeded by data availability problems.

Herding behavior destabilizes the financial markets and creates volatility in the market. Capital flows in the emerging markets are notoriously volatile. Moreover the herding behavior in financial markets is mostly held by market participants and economist, because most of the data that financial economist have to deal with comes from stock market in which a lot of informed investors are at their best

advantageous. Informed institutional investors are more sensitive towards high transaction cost in their trading activities (Romano, 2009). The high transaction cost lead to these informed investors to herd while low transaction cost encourage them to invest in both large and small quantity of stocks.

Herding behavior is at higher level in developing countries/emerging markets than developed countries (Wang, 2008). The evolution and cross section relationship of herding behavior especially at the time of sudden events occurred like financial crisis because they follow the pattern of cycles. Financial crises are widely argued to be due to herd behavior (Chari & Kehoe, 2003). Yet recently developed models of herd behavior have been subjected to two critiques which seem to make them inapplicable to financial crises. Herding behavior distinct the risk from uncertainty like the known probability distribution of random variable is risk while unknown probability distribution is uncertainty (Knight, 1921).

Knight's distinction in Bayesian decision theory has no interesting consequences. Investors act in their best interest to maximize the expected gains irrespective of the fluctuations are risky or uncertain but Knight's idea seems to have some intuitive appeal. The theoretical literature has tried to identify the mechanisms that lead traders to herd (Gale, 1996; Hirshleifer & Teoh, 2003; Chamley, 2004). The theoretical contributions have emphasized that, in financial markets, the fact that prices adjust to the order flow makes it more difficult for herding to arise than in other setups, such as those studied in the social learning literature, where there is no price mechanism. Nevertheless, it is possible that rational traders herd because of different kinds of uncertainty in the market. The act of trying to use the information contained in the decisions made by others makes each person's decision less responsive to her own information. Indeed, we find that in equilibrium the reduction of informativeness may be so severe that in an ex ante welfare sense society may actually be better off by constraining some of the people to use only their own information.

The study aims to examine the herding behavior in Pakistani financial markets. The focus is to see the environment that how herding behavior effect the markets in developing countries. The aim of this paper is to develop a simple model in which we can study the reasons behind the decision by the investors and its implications in uncertainty. We provide an overview of recent theoretical and empirical research on rational herd behavior in financial markets. Specifically, we examine what precisely is meant by herding, what are possible causes of rational herd behavior. The question of whether investors exhibit herd behavior in their trading strategies has been widely investigated for a range of markets in recent years. The central question is that investors, analyst and mutual fund managers follow the trend in financial markets in developing countries in order to save them from reputational loss.

Literature Review

Jurkatis and Nautz (2012) investigated that herding behavior is due to the correlation of trades and that correlation of trades is because of unintentional investor's in relation to public information. The results strongly suggest that the observed correlation of trades is mainly due to the common reaction of investors to new public information and should not be misinterpreted as herd behavior. The study also shows that herding intensity is high when market is in trouble and herding intensity is low at the opening intervals of the markets. Hsieh, Yang and Lee (2011) found that mutual fund inflows into the Asian market are associated the positive stock returns and currency appreciations but this behavior is not consistent in different conditions. They also found that positive feedback effect and herding behavior exist in Asian markets.

Holmes, Kallinterakis and Ferreira (2013) investigated that while using monthly holdings data for Portugal found clear evidence of herding and investigate whether such behavior is intentional or spurious. The study concluded that herding behavior is intentional. The results were consistent with herding while window dressing in mutual funds buy and sell decisions. The results suggest that herding is more prevalent when market returns are high or low. They also find that herding is more prevalent in 2nd month of each quarter. All this shows that herding is done intentional and for reputational reasons / informational reasons.

Kremer and Nautz (2011) investigated the short term herding behavior of institutional investors. Their results were statistically significant but quite low. The study found that short-term herding is even more pronounced in large stocks and highly developed market segments. Agarwal, Chiu, Liu, and Rhee (2011) examine the herding behavior of domestic and foreign investors. They found that foreign investors have greater propensity to herd than domestic investors. But while examining investors trading across brokerage firms they find the weak evidence of domestic investors herding behavior and no herding behavior by foreign investors. They overall concluded that the string brokerage firms have a strong impact on herding.

Donga et al., (2010) proved that if the value functions of market makers and traders are homogeneous, herd behavior will never happen even if ambiguity exists. If some types of traders have different attitudes towards ambiguity from market makers, then herd behavior will happen with a positive probability. They also concluded that herd buying behavior mostly occurs at the peak of stock prices and is the main factors that cause price bubbles to be sustained temporarily. Moreover, the ambiguity in the distributions of stock values has a direct influence on the occurrence probability of herd behavior. They also suggest that herding behavior has positive impact upon stock prices and creates bubbles in the market. Herding behavior is frequently prevalent in financial markets where traders make their investments and trade decisions frequently.

Park and Sabourian (2010) described the situations of underlying information that are considered necessary and sufficient for the herding behavior contrarianism. Herding and contrarian behavior brings higher volatility in stock prices and hence lower liquidity in the market. Romano (2009) examined that informed institutional investors are more sensitive towards high transaction cost in their trading activities. The analysis showed that high transaction cost lead to these informed investors to herd while low transaction cost encourage them to invest in both large and small quantity of stocks. Wang (2008) investigated cross sectional use of beta to find out the herding behavior towards market in developed and emerging financial markets. They applied the rolling robust approach to find out the betas in order to diminish the impact of multivariate on return data. They found that herding behavior is at higher level in developing countries/emerging markets than developed countries. They also examine that evolution and cross section relationship of herding behavior especially at the time of sudden events occurred like financial crisis because they follow the pattern of cycles. They also witnessed that correlation between the two markets in the same group is positive and negative with another group. Alemanni and Ornelas (2006) empirically analyze that herding behavior of investors in emerging markets and measure the herding behavior of foreign investors.

Methodology

The study used the Hwang and Salmon (2004) model to test the herding behavior in Pakistan Stock Exchange. The data was collected from eight major sectors which are covering the thirty three companies of the stock exchange which stocks are actively traded in the stock market. We have taken

the monthly data of these companies for seven years to test whether herding behavior exist in the stock market or not. The following proposed model by Hwang and Salmon (2004) is used to estimate the degree of herding is given below.

$$H_{m,t} = \frac{1}{N} \sum_{i=1}^N [\beta_{i,t} - 1]^2$$

Where, $\beta_{i,t}$ is the time-invariant systematic risk measure of the security, $i = 1, \dots, N$ and $t = 1, \dots, T$.

$H_{m,t}$ is the measure of degree of herding,

If $H_{m,t} = 0$, then no herding and

If $H_{m,t} = 1$ means perfect herding.

Results and Discussions

The results show that there is little bit herding exist over the years in the whole market of Pakistan Stock Exchange. There exists no herding and perfect herding in the overall market, but the herding trend rises at the last six months of year 2018, and in last two months value of $H_{m,t}$ is more than 0.5 which suggests the presence of herding.

Table 1: Estimation results of overall herding

	2013	2014	2015	2016	2017	2018
Jan	0.26291696	0.209412729	0.234592535	0.277156012	0.248644725	0.235674661
Feb	0.28908149	0.201538168	0.237601441	0.278546518	0.240797876	0.268439457
March	0.262323574	0.212712417	0.25416648	0.270544824	0.271089885	0.28549508
April	0.264996828	0.338477895	0.250104294	0.275202536	0.271630676	0.270229147
May	0.252716143	0.208370254	0.265646261	0.25432561	0.262564198	0.286211873
June	0.238660727	0.216447394	0.268614817	0.272843889	0.231215833	0.367327425
July	0.238660727	0.206193865	0.275749537	0.267794149	0.302743364	0.371911517
August	0.207053066	0.220529758	0.261232867	0.25913467	0.23668992	0.353013042
September	0.194938319	0.194395827	0.273697385	0.257272688	0.244101797	0.338176972
October	0.211569583		0.280454229	0.249315923	0.244647999	0.419368974
November	0.23159183		0.281550989	0.421925276	0.21344268	0.544816877
December	0.358289723	0.26435466	0.278108331	0.243823637	0.222831776	0.556229737

Sector wise Herding

We also examine the herding behavior individually in the seven sectors of Pakistan Stock Exchange, and the suggested results are as follows. We solely investigate the herding behavior in banking sector (Please see table 2) by using the Hwang and Salmon (2004) Model, it propose that herding does not exist as the value of $H_{m,t}$ is significantly below the 0.5.

While testing the herding behavior in cement sector (Please see table 3), there exists a little bit herding have in that sector during the period 2013-2018. The results suggests that there is perfect herding in the last months of 2018 as the value of $H_{m,t}$ is more than 1. In testing the herding behavior in Fertilizer sector (Please see table 4) there exists a little bit herding have in that sector during the period 2013-2018. The results suggests that there is no perfect herding in that sector as the value of $H_{m,t}$ is lower than 1 and up to some extent herding behavior have been found because the value of $H_{m,t}$ is greater than 0.

Table2: Estimation results of banking sector herding

	2013	2014	2015	2016	2017	2018
Jan	0.3124	0.2592	0.0737	0.0865	0.0498	0.0941
Feb	0.2979	0.2268	0.0923	0.0857	0.1247	0.1667
March	0.3044	0.2432	0.0890	0.0914	0.1527	0.1603
April	0.3784	0.2268	0.0833	0.0958	0.1562	0.1427
May	0.4001	0.0755	0.0557	0.0929	0.1217	0.1449
June	0.3938	0.0841	0.0576	0.0970	0.1174	0.1550
July	0.4195	0.0586	0.0592	0.0950	0.1532	0.1276
August	0.3697	0.0584	0.0682	0.0937	0.0676	0.0903
September	0.3364		0.0657	0.0862	0.1163	0.0880
October	0.3030		0.0742	0.0849	0.1156	0.1139
November	0.3063	0.0583	0.0834	0.0790	0.0949	0.1013
December	0.2926	0.0837	0.0826	0.0518	0.0857	0.1050

Table 3: Estimation results of cement sector herding

	2013	2014	2015	2016	2017	2018
Jan	0.0549	0.0736	0.2582	0.2471	0.1955	0.2437
Feb	0.0532	0.0707	0.2633	0.2525	0.1965	0.3393
March	0.0446	0.0759	0.2372	0.2496	0.2103	0.4457
April	0.0338	0.1683	0.2322	0.2599	0.2097	0.4290
May	0.0217	0.2010	0.2435	0.2342	0.1734	0.4612
June	0.0229	0.1977	0.2433	0.2454	0.1323	0.4958
July	0.0273	0.1801	0.2647	0.2476	0.1601	0.8747
August	0.0215	0.2357	0.2770	0.2752	0.1389	0.8574
September	0.0225		0.2666	0.2737	0.1769	0.9352
October	0.0605		0.2700	0.2679	0.1783	1.1729
November	0.0592	0.1724	0.2609	0.1931	0.1475	1.6569
December	0.0769	0.2736	0.2525	0.1800	0.1880	1.7038

Table 4: Estimation results of Fertilizer sector herding

	2013	2014	2015	2016	2017	2018
Jan	0.2287	0.0898	0.0520	0.0526	0.0609	0.0789
Feb	0.2402	0.0947	0.0507	0.0511	0.0206	0.0919
March	0.2229	0.1040	0.0511	0.0447	0.1061	0.0658
April	0.1956	0.1566	0.0502	0.0446	0.1042	0.1377
May	0.1554	0.0873	0.0541	0.0426	0.1122	0.1752
June	0.1223	0.0804	0.0548	0.0491	0.1104	0.2340
July	0.1277	0.0794	0.0511	0.0487	0.0669	0.2584
August	0.1054	0.0498	0.0527	0.0605	0.0961	0.2070
September	0.1043		0.0514	0.0702	0.0362	0.2578
October	0.1102		0.0569	0.0696	0.0348	0.3163
November	0.0956	0.0464	0.0511	0.4071	0.0450	0.4290
December	0.1144	0.0713	0.0507	0.0626	0.0643	0.4599

Table 5: Estimation results of Oil and Gas Refinery sector herding

	2013	2014	2015	2016	2017	2018
Jan	0.4839	0.1705	0.1494	0.1681	0.4113	0.6830
Feb	0.5923	0.2013	0.1904	0.1679	0.3564	0.4246
March	0.3838	0.2210	0.2031	0.1768	0.3219	0.3904
April	0.2845	0.3663	0.2262	0.1755	0.3208	0.3879
May	0.2210	0.0703	0.2372	0.1652	0.4176	0.3723
June	0.2102	0.0585	0.2184	0.2111	0.2230	0.5153
July	0.3452	0.0329	0.2204	0.2123	0.5790	0.2697
August	0.3409	0.0567	0.1730	0.2102	0.7179	0.2618
September	0.2659		0.1900	0.2019	0.7852	0.1803
October	0.2495		0.1857	0.2028	0.7829	0.2119
November	0.2277	0.0859	0.1831	0.7110	0.7279	0.1073
December	0.2194	0.1681	0.1756	0.4090	0.7349	0.1125

In testing the herding behavior in Oil & Gas refinery sector (Please see table 5) there exists a little bit herding in that sector during the period 2013-2018, but the results suggests that herding behavior during the last six months of 2017 was significantly high as compare to other months of the period 2013-2018. The results also suggests that there is no perfect herding as the value of Hmt is lower than 1 and a little bit herding because the value of Hmt is higher than 0 in that sector during the period 2013-2018.

We also test the herding behavior in Oil & Gas marketing sector as shown in table 6. In some months the herding behavior is more and in some months the herding behavior is found less of the period 2013-2018. The results suggests that there is no perfect herding in that sector as the value of Hmt is lower than 1 and up to some extent the herding behavior have been found as the value of Hmt is greater than 0 during the period 2013-2018.

We also test the herding behavior in textile sector, and report the findings in table 7. In some months the herding behavior is more and in some months the herding behavior is found less of the period 2013-2018. The results suggests that there is no perfect herding in that sector as the value of Hmt is lower than 1 and up to some extent the herding behavior have been found as the value of Hmt is greater than 0 during the period 2013-2018.

Table 6: Estimation results of oil and gas marketing sector herding

	2013	2014	2015	2016	2017	2018
Jan	0.3071	0.1997	0.3217	0.3670	0.4923	0.3398
Feb	0.3030	0.1970	0.3383	0.3666	0.4491	0.3979
March	0.2861	0.2023	0.3326	0.3427	0.4568	0.3589
April	0.2971	0.2721	0.3345	0.3493	0.4600	0.4661
May	0.3048	0.2871	0.3412	0.3460	0.4481	0.4355
June	0.2901	0.3012	0.3411	0.3897	0.4116	0.5135
July	0.3273	0.2953	0.3460	0.3835	0.3692	0.4772
August	0.2489	0.3148	0.3533	0.3869	0.3749	0.4794
September	0.2290		0.3640	0.4021	0.3393	0.4304
October	0.2253		0.3647	0.4118	0.3371	0.4489
November	0.2414	0.3054	0.3737	0.9095	0.3235	0.4680
December	0.2416	0.3117	0.3730	0.5265	0.3287	0.4690

Table 7: Estimation results of textile sector herding

	2013	2014	2015	2016	2017	2018
Jan	0.3241	0.4275	0.5036	0.6567	0.4082	0.2149
Feb	0.4225	0.4115	0.4546	0.6615	0.3760	0.2792
March	0.4177	0.4261	0.5712	0.6378	0.4447	0.3308
April	0.4173	0.8479	0.5482	0.6429	0.4433	0.1521
May	0.3909	0.4874	0.6293	0.5711	0.4278	0.2088
June	0.3559	0.5217	0.6399	0.5817	0.4339	0.4105
July	0.3938	0.5338	0.6576	0.5628	0.6171	0.2360
August	0.2003	0.5469	0.5861	0.4923	0.3008	0.2407
September	0.2301		0.6423	0.4782	0.2791	0.1313
October	0.3249		0.6557	0.4344	0.2853	0.2255
November	0.4388	0.4662	0.6571	0.5461	0.2101	0.3962
December	1.1049	0.6069	0.6528	0.3669	0.2086	0.3810

Table 8: Estimation results of tobacco sector herding

	2013	2014	2015	2016	2017	2018
Jan	0.0502	0.0114	0.1553	0.2905	0.0461	0.0672
Feb	0.0585	0.0007	0.1843	0.2886	0.0006	0.0815
March	0.0160	0.0027	0.1834	0.2704	0.0022	0.1261
April	0.0033	0.0611	0.1860	0.2680	0.0020	0.1165
May	0.0024	0.0133	0.2406	0.2601	0.0011	0.1294
June	0.0371	0.0177	0.3136	0.3115	0.0109	0.1822
July	0.0830	0.0119	0.2805	0.2929	0.1012	0.1153
August	0.0183	0.0092	0.2071	0.2242	0.0497	0.0657
September	0.0078		0.2494	0.2211	0.0649	0.0834
October	0.0209		0.2925	0.2238	0.0650	0.0867
November	0.0058	0.0107	0.2950	0.2045	0.0393	0.0279
December	0.0027	0.2422	0.2943	0.0482	0.0460	0.0334

In the end, we test the herding behavior in tobacco sector (Please see table 8) regarding the trading of their stocks in stock market. In some months the herding behavior is more, while in some other months it is found less during the period 2013-2018. The results suggest that there is no perfect herding in that sector as the value of Hmt is lower than 1. However, up to some extent the herding behavior has been observed as the value of Hmt is greater than 0 during the sample period.

Conclusion

This study has examined the existence of herd behavior in Pakistani financial markets. According to the results, significant herding is present in Pakistani stock markets during 2013-2018. Moreover, herding is found to be stronger during periods of rising markets in these stock markets especially at the end of 2018, and herding was perfect in cement sector. Herding is present in the Pakistani stock market during periods of down returns. Moreover, we examine the possible effects of herding with respect to trading volume/market price and market volatility. The results indicate the existence of herding in the Pakistani stock market during periods of high trading volume. A significant evidence of herd behavior is present under both the conditions of high market volatility and low market volatility in Pakistani stock markets. There is no asymmetric effect of herding with respect to market volatility for the Pakistani stock market. Finally, there is evidence of herding during the global economic crisis. Investor behavior seems to have been rational in Pakistani stock market during the global financial/economic crisis.

Table 9: Estimation results of textile sector herding

	2013	2014	2015	2016	2017	2018
Jan	0.3241	0.4275	0.5036	0.6567	0.4082	0.2149
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