Herding In Financial Markets : Evidence from The Athens Stock Exchange

This paper examines:
- the existence of herding behaviour in the Athens Stock Exchange.
- it estimates the implications of herding behaviour in terms of market
returns, volume of transaction and volatility.
-it tests whether herding effects become more intense during the recent period of the Greek debt crisis.

Herding – Definition:
Herd behaviour itself pertains to the instinct of animals to follow the herd, a diverse set of theoretical approaches have allowed the concept to be applied to many domains. Relating to the field of behavioural finance, herding behaviour is generally characterized by mimicking the actions of other investors, which constitute the market consensus

Generally speaking, in economics and finance, with the term herding or herd behaviour we mean the process where economic agents are imitating each other actions and/or base their decisions upon the actions of others.

Market Trend and herding behaviour :
- herd behaviour is most likely to occur during periods of extreme market movements, as investors would then be more triggered to follow the market consensus
- investors tend to herd more intensively during either an upward movement or a downward movement of the market
- herd behaviour is more profound among smaller stocks compared to heavily followed larger cap stocks

Key Fact About Greece Economic Crisis :
- Athex Composite Share Price Index experienced a 70% decline, while the capitalization of ASE shrank from €83.5bn to €26.8bn
- Greece's ability to meet its debt obligations due to strong increase in government debt levels.
- bond yields rising so high

Measurement of Herding Behaviour :
The average tendency of a group of investors (money managers) to disproportionately buy or sell particular stocks at the same time, relative to what would be expected if investors traded independently.

Calculation: They compute herding as the proportion of net buyers(investors who increase their holdings in a stock during a given period) relative to the total number of investors who trade that stock minus an adjustment factor that declines, as the number of investors active in that stock, rises. If no herding exists, the expected value of this metric should not vary from period to period; in the presence of herding there should be significant cross-sectional variation in this measure.

$$H(i,t) = \left| p(i,t) - p(t) \right| - AF(i,t)$$

$$AF(i,t) = E\left[\left| p(i,t) - p(t) \right| \right]$$

-AF declines as the number of investors
active in that stock rises.

New Method :

portfoliochange
measure (PCM) of correlated trading. The model defined herding by the extent to
which portfolio-weights, assigned to the various stocks by different investors, move in the
same direction. The intensity of beliefs is captured by the percent change of the fraction

accounted for by a stock in a fund portfolio. The cross-correlation PCM of lag between portfolio and is defined as follows:

$$\hat{\rho}_{t,\tau}^{I,J} = \frac{\frac{1}{N_t}\sum_{n=1}^{N_t}(\Delta\tilde{\omega}_{n,t}^{I})(\Delta\tilde{\omega}_{n,t-\tau}^{J})}{\hat{\sigma}^{I,J}(\tau)}$$

where:

$(\Delta\tilde{\omega}_{n,t}^{I})$: the change in portfolio I's weight of n during the period $[t-1,t]$

$(\Delta\tilde{\omega}_{n,t-\tau}^{J})$: the change in portfolio J's weight of n during the period $[t-\tau-1,t-\tau]$

N_t : the number of stocks in the intersection of the set of tradable securities in portfolio I during period $[t-1,t]$ and the set of tradable securities in portfolio J during period $[t-\tau-1,t-\tau]$, and

$$\hat{\sigma}^{I,J}(\tau) = \frac{1}{T}\sum_{t}\frac{1}{N_t}\sqrt{\sum_{n=1}^{N_t}(\Delta\tilde{\omega}_{n,t}^{I})^2 \sum_{n-1}^{N_t}(\Delta\tilde{\omega}_{n,t-\tau}^{J})^2}$$

the cross-sectional standard deviation (CSSD) of individual stock returns as a measure of the degree of clustering around the market aggregate. Rational asset pricing suggests that an increase in market returns will be associated with an increase in the cross-sectional standard deviation of stock returns given the exposure of individual stock returns to the market portfolio. In contrast, in the presence of herding, CSSD is expected to increase at a decreasing rate or it might even fall if herding is severe.

If investors trust market expectations and follow them, investors' return will not deviate from market return, whereas dispersion level or variance between individuals' return and market return, in light of adopting herd behaviour by investors, will be zero.

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

The CSSD of returns is regressed against a constant and two dummies in order to identify the extreme market phases, with $D^l = 1$ if the market return on day lies in the extreme 1% and 5% lower tail of the distribution of market returns (and zero otherwise), and $D^u = 1$ if it lies in the extreme 1% and 5% upper tail of the same distribution (and zero otherwise):

$$CSSD_t = a + \beta_1 D_t^L + \beta_2 D_t^U + \varepsilon_t$$

where the coefficient "a "denotes the average dispersion of the sample excluding the regions corresponding to the two dummy variables. According to this model, statistically significant negative values of the estimated coefficients B1 and B2 , indicate the presence of herd behaviour.

In other words, when the CSSD of stock returns is low under large price movements, herding is detected.

The average cross-sectional absolute deviation (CSAD$_t$)
show that under the CAPM assumptions, CSAD$_t$ should be a linear function of market returns. Any evidence that the relation is not linear could be interpreted as evidence in favor of herding behavior.
If herding occurs, the coefficient of the non-linear term is expected to be negative
indicating that after a market move, CSAD might be increasing at a decreasing rate or even
falling if the absolute market return is large enough

$$CSAD_{i,t} = \frac{1}{N}\sum_{i=1}^{N}\left|R_{i,t} - R_{m,t}\right|$$

The main idea of this approach is that if the herd behaviour becomes apparent among investors, the relationship between the cross-sectional deviation and market portfolio is a linear one, and this shall mean that Cross-Sectional Absolute Deviation (CSAD) will decrease or increase at least less than the relative rate of market return.

$$CSAD_t = a + \gamma_1\left|R_{m,t}\right| + \gamma_2 R_{m,t}^2 + \varepsilon_t$$

It follows that an increase in the absolute value of market returns
will result in a rise in the dispersion of individual stock returns.

A **positive statistically significant coefficient of y1 will be in line with the predictions of the rational asset pricing model.**
a statistically significant **negative coefficient y2** indicates the presence of herding behavior. In that case, it is implied that investors in days of extreme market movements are inclined to act in line with the consensus of the market and suppress their own predictions in respect with asset price, so the cross-sectional dispersion of stock returns is expected to decrease or increase considerably less than proportionally with market return.

Herd Behaviour in the Athens Stock Exchange:

-Analysing Period : January 1, 2002 to December 31,
2012.
- 430 stocks traded during that period

The results
-herding is not a dominant behaviour in the Greek equity market over the whole 2002-2012 period.
-However, when herding is examined in certain sub-periods, strong evidence of herding effects can be found.
 In these periods **herding behaviour** is
-more pronounced under conditions of declining market returns, high trading volume and
low volatility, while the recent debt crisis does not induce a more intense herding activity.
Capitalization appears to play a particular role, since **herding effects are usually attributed to small stocks.**

The detection of the existence or absence of herding behaviour depends largely on the
specific sample period considered.
-The method of calculating market returns and cross-sectional dispersion (equally
weighted or value weighted) affects the estimations about herding effects.
- When herding behaviour is confirmed in the Greek equity market, it usually the result
of investors' transactions with small stocks. Most of the times, large stock show
evidence of anti-herding behaviour.
-In general herding behaviour is more pronounced under conditions of high trading
volume and low volatility.