

# The Impact of Herding Behavior on Stock Mispricing: The Case of Listed Companies at the Egyptian Exchange

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## ABSTRACT

This paper aims at examining the impact of herding behavior on stock mispricing. Herding behavior is measured by Cross Sectional of Standard Deviation (CSSD), while stock mispricing is measured by the difference between the market value and intrinsic value of stock. This has been conducted using a sample of 24 companies are listed at the Egyptian exchange during the period from 2002 to 2018.

Results indicate there is a significant effect of herd behavior on stock mispricing in a bivariate context, while the effect remains significant, even after controlling for inflation rate and discount rate. Besides, the discount rates don't seem to have any significant effects on stock mispricing.

**Keywords:** behavioral finance, herding behavior, mispricing.

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## I. INTRODUCTION

Behavioral finance is referred as a deviation from rational track investors, which couldn't be explained by the *classical theory*. It's not only about human actions, but also about understanding the reasoning patterns of investors including emotional factors and its influence in decision making [1].

According to [2] and [3], herd behavior is related to individuals' collective actions under uncertainty. The investors show herding behavior to mitigate uncertainty and to maximize their confidence in returns on investment. So, irrational behavior can lead to mispricing between a stock price and a company's intrinsic value.

This study attempts to examine the impact of herding behavior on stock mispricing. Herding behavior has been measured by Cross Sectional Standard Deviation (CSSD), while stock mispricing is measured by the distinguish between the market value and intrinsic value of stock. Table (1) shows the highest 4 mispriced stocks in the Egyptian exchange during the period from 2014 to 2018, as follow (Table I).

In brief, this paper attempts to investigate the effect of herding behavior on stock mispricing. After this introduction, section 2 the literature review concerned with herding behavior and stock mispricing. Section 3 illustrates how to measure research variables and explains how to test the hypotheses. Section 4 is for present findings and discuss how these findings answer research question. Section 5 is summarizing the paper and provide remarks about conclusions.

## II. LITERATURE REVIEW

This section attempts to explain some of previous studies, which has been concerned with both of herding behavior and stock mispricing.

Regarding herding behavior, Filip, Pochea, & Pece [4] investigates the existence of herding behavior of investors from emerging markets at industry level specialty, according to the CEE capital markets using firm level information CSAD, proposed by Chang et al [5]. Results indicate there is a significant impact of the subprime financial crisis on the investors' actions. Besides, Qasim, Mehboob, Hussain, & Arshad, Mehboob [6] examines the effect of herd behavior and over-confidence biases on making the investors' decision in Pakistan according to 150 stock market participants, with 100 completed questionnaires being processed. The Ordinary Least Square (OLS) approach has been used to evaluate the relationship between investor decision-making and herd behavior, additionally over-confidence biases. Both herding actions and overconfidence biases have affected Pakistani investors' decisions, according to the findings.

Filiz, Nahmer, & Spiwoks [7] investigates the effect of emotions on the tendency towards herding behavior. Three therapies are used in a between-subjects configuration (neutral, optimistic and pessimistic mood). The mood is impacted by methods of film excerpts are shown to the issues. It is shown the mood really has an effect on the tendency towards herd behavior. A neutral mood in specific favors a tendency towards herding behavior. Moreover, Hudson [8] examines the effect of investors' sentiment on UK returns on equity by differentiating between calm and financial crisis times. It has been discovered that each of US individual and institutional sentiment has a major impact on

UK returns on equity, while the local UK investor sentiment has a negligible impact. The sentiment contagion across

boundaries seems to be more prominent in the short term in investment.

TABLE I: HERDING BEHAVIOR AND STOCK MISPRICING IN THE EGYPTIAN EXCHANGE FROM 2014 TO 2018

No.	Stock	Year	Closing Price	Intrinsic Value	No. of shares	CSSD	Mispricing	
							Value	%
1	EGBE	2014	1.14	9.88	233,560	1.53%	-8.74	-88.50%
		2015	1.26	10.56	255,575	2.03%	-9.3	-88.10%
		2016	1	11.28	255,575	3.39%	-10.28	-91.10%
		2017	0.88	12.1	314,796	1.98%	-11.22	-92.70%
		2018	0.62	18.1	342,802	1.89%	-17.48	-96.60%
2	ORWE	2014	12.08	24.21	450,000	1.86%	-12.13	-50.10%
		2015	7.9	55.89	450,000	1.82%	-47.99	-85.90%
		2016	15.49	54.68	450,000	3.87%	-39.19	-71.70%
		2017	16.59	85.22	450,000	1.85%	-68.63	-80.50%
		2018	6.97	169.07	443,405	4.33%	-162.1	-95.90%
3	EFIC	2014	9.67	52.04	69,302	1.41%	-42.37	-81.40%
		2015	6.71	92.79	69,302	1.52%	-86.08	-92.80%
		2016	8.74	34.13	69,302	3.45%	-25.39	-74.40%
		2017	17.24	32.64	72,767	2.30%	-15.4	-47.20%
		2018	9.44	53.8	72,767	2.50%	-44.36	-82.50%
4	ETEL	2014	11.92	22.57	1,707,072	1.33%	-10.65	-47.20%
		2015	6.42	24.68	1,707,072	1.30%	-18.26	-74.00%
		2016	11.75	35.83	1,707,072	3.42%	-24.08	-67.20%
		2017	13.42	35.89	1,707,072	1.66%	-22.47	-62.60%
		2018	12.68	23.93	1,707,072	1.67%	-11.25	-47.00%

Source: Outputs of data processing.

Concerning with stock mispricing, Trinugroho & Rinofah [9] investigates the effect of mispricing on firm's investment behavior and capital structure. Results show that mispricing has a positive effect on company investment using pooled panel data of Indonesian manufacturing firms from 2003 to 2007. Besides, findings indicate that mispricing may affect firms in choosing sources of funding according to the debt to equity ratio (D/E). Moreover, Pantzalis & Park [10] investigates the relationship between agency cost and equity mispricing and indicate that mispricing is significantly and positively associated with agency cost. Results indicate the stock option, initially intended to resolve balance dispute of interests, overstate the problem. Overall, the study has suggested that compensation packages that are not well-structured can lead to more mispricing.

Recently, Sakaki, Jory & Jackson [11] investigates the effect of institutional investors' equity ownership constancy and horizon of their investment. This examination is vital in estimating equity mispricing because of institutional investors seem to be a heterogeneous group, i.e., they have different investment horizons and aim to affect firm success in different ways. Results indicate that equity mispricing at invested firms is linked to the constancy and percentage of institutional investor's equity holding.

Comparing with previous studies, this study attempts to examine the impact of herding behavior on stock mispricing with the inflation rate and discount rate as control variables.

### III. MEASURING VARIABLES AND TESTING HYPOTHESIS

Herding behavior has been addressed by many scholars. According to [5], [12]-[15] the standard deviation of cross-sectional measure can be used to detect herd behavior during times of severe market volatility. Specific stock price returns

do not deviate greatly from market returns if investors copy one another. In other words, during times of high uncertainty, the degree of dispersion declines. But, when stock returns deviate from market returns, dispersion rises. Christie & Huang model indicate that if the investor's during extreme fluctuation periods follow market consensus, dispersion becomes significantly lower than the mean. The cross sectional of standard deviation can be expressed as:

$$CSSD_t = \sqrt{\frac{\sum_{i=1}^N (R_{i,t} - R_{m,t})^2}{N-1}}$$

where  $CSSD_t$  is Std. deviation of cross sectional,  $R_{i,t}$  is a price change in the stock at time  $t$ ,  $R_{m,t}$  is average of cross-sectional return of the  $N$  returns in the market portfolio at time  $t$ , and  $N$  is the number of shares in the portfolio.

To determine the presence of herding behavior a dummy variable technique is used. The CSSD returns are regressed against a constant and two dummy variables to identify the extreme market phases, as follows:

$$CSSD_t = \alpha + Q^{up} D_t^{up} + Q^{down} D_t^{down} + s_t$$

where  $\alpha$  is the coefficient of average dispersion of the sample excluding the regions corresponding to the two dummy variables.  $D_t^{up} = 1$ , if the market return on day  $t$  lies in the extreme lower tail of the distribution; and = zero (otherwise).  $D_t^{down} = 1$ , if the market return on day  $t$  lies in the extreme upper tail of the distribution; and = zero (otherwise).  $Q^{up}$ ,  $Q^{down}$  indicate the presence of negative and statistically significant coefficients of herding behavior.

Stock mispricing causes a distinguish between a stock

price and a company's intrinsic value, so the researchers depend on the following formula [16]:

$$\text{Stock Mispricing} = \frac{\text{Market value} - \text{Intrinsic value}}{\text{Intrinsic value}}$$

The most important methods used to estimate the intrinsic value the free cash flow method and the residual income method. The free cash flow valuation model expected the value of the entire company by finding the present value of its estimated free cash flows discounted at its weighted average cost of capital, which equals its estimated average future cost of finance over the long run as follows [17], [18]:

$$IV = \frac{FCF_1}{(1+r)^1} + \frac{FCF_2}{(1+r)^2} + \dots \frac{FCF_\infty}{(1+r)^\infty}$$

Free Cash Flow (FCF) = operating cash flow before interest and tax – (Change in capital expenditure - depreciation) - change in working capital. IV is intrinsic value and r is the weighted average cost of capital (WACC), where:

$$r = \left(\frac{E}{V} \times r_e\right) + \left(\frac{D}{V} \times r_d\right) \times (1 - TC)$$

E is the book value of owner's equity and D is the book value of loans, while V = E + D.  $r_e$  is the required rate of return on owner's equity and  $r_d$  = cost of loans and TC = tax rate.

The residual income model is known as future financial profit is generally define net income during the period minus book value of owner's equity times the required rate of return on owner's equity [19]. The residual income model is measured by [20], as follows:

$$RI_t = E_t - (ROE - r) \times B_{t-1}, IV = B_0 + \sum_{t=1}^N \frac{RI_t}{(1+re)^t} + \dots$$

$RI_1$  is the residual income in future periods and  $E_t$  is the net income during the period t, while  $B_{t-1}$  is the book value of owner's equity at time t and  $B_0$  is the current book value of owner's equity.  $r_e$  is the required rate of return on equity and ROE is the estimated rate of return on equity.

Table II shows the research variables, as follows:

TABLE II: THE RESEARCH VARIABLES		
Variable	Calculation	Sign
HD	Cross Sectional Standard Deviation (CSSD)	Herding Behavior
Mis	Market value – Intrinsic value	Stock Mispricing
Inf	Intrinsic value	Mispricing
Inf	The annual inflation rate in Egypt.	Inflation Rate
Dis	The annual discount rate in Egypt.	Discount rate

This study aims at testing the following three hypothesis:

1. There is no significant effect of herding behavior on stock mispricing.
2. There is no significant effect inflation rate on stock mispricing.
3. There is no significant effect discount rate on stock mispricing.

Regarding the above-shown hypotheses, the null hypothesis H0 states that,  $\beta = 0$ , while the alternative hypothesis H1 states that,  $\beta \neq 0$

$$Mis_{it} = \alpha + \beta_1 HD_{it} + \beta_2 Inf_t + \beta_3 Dis_t + \varepsilon$$

Regarding the first hypotheses, the null hypothesis H0 states that  $\beta_1 = 0$ , while the alternative hypothesis H1 states that  $\beta_1 \neq 0$ .

Regarding the second hypotheses, the null hypothesis H0 states that  $\beta_2 = 0$ , while the alternative hypothesis H1 states that  $\beta_2 \neq 0$ .

Regarding the third hypotheses, the null hypothesis H0 states that  $\beta_3 = 0$ , while the alternative hypothesis H1 states that  $\beta_3 \neq 0$ .

#### IV. DESCRIPTIVE STATISTICS AND TEST HYPOTHESES

Required data include herding behavior and stock mispricing for a sample of 24 listed companies at the Egyptian Exchange during period from 2002 to 2018. Table III illustrates the descriptive statistics as follows:

TABLE III: DESCRIPTIVE STATISTICS OF RESEARCH VARIABLES

Variables	Herding Behavior	Stock Mispricing	Inflation rate	Discount rate
Mean	2.95	17.28	10.971	10.441
Minimum	1.67	-79.6	2.74	8.5
Maximum	4.73	636.38	29.51	17.25
Std.Deviation	0.67	143.3	6.114	2.714
Skewness	0.699	3.353	1.599	1.944
Kurtosis	1.076	16.288	4.77	3.676

Source: Outputs of data processing using E-views 10.

Table III indicate that mean of herding behavior is 2.95 with a Std. deviation of 0.67, while stock mispricing has a mean of 17.28 and a Std. deviation of 143.3. Besides, inflation rate shows a mean of 10.971 and a Std. deviation of 6.114, while Discount rate has a mean of 10.441 and a Std. deviation of 2.714.

Table IV shows the correlation coefficients between research variables, as follows:

TABLE IV: CORRELATION COEFFICIENTS BETWEEN RESEARCH VARIABLES

	Stock Mispricing	Herding Behavior	Inflation rate	Discount rate
Stock Mispricing	1.000			
Herding Behavior	0.776	1.000		
Inflation rate	0.720	0.606	1.000	
Discount rate	0.717	0.642	0.709	1.000

Source: Outputs of data processing using E-views 10.

Table IV indicate that mispricing is correlated with herding behavior at a coefficient of 0.776, while the correlation coefficients between stock mispricing and each of inflation rate and discount rate are 0.720 and 0.717 respectively.

Research hypotheses are about investigating the effects of each of "herding behavior", "inflation rate" and "discount rate" on "stock mispricing". Model (1) tries to assess the effect of "herding behavior", while model (2) concerns with examining the influences of each of "herding behavior" and "inflation rate". Model (3) attempts to assess the effect of

each of “herding behavior” and “discount rate”, while model (4) concerns with investigating the effects of each of “herding behavior”, “inflation rate” and “discount rate”.

Table V illustrates the determinants of stock mispricing according to GMM technique, using a sample of 24 companies are listed at the Egyptian exchange during the period from 2002 to 2018, as follows:

TABLE V: DETERMINANTS OF STOCK MISPRICING USING GMM  
TECHNIQUE FROM 2002 TO 2018

Model (1)	Model (2)	Model (3)	Model (4)
<b>-74.71</b> (3.95)**	<b>-86.65</b> (4.86)**	<b>-109.808</b> (4.321)*	<b>-103.79</b> (4.12)**
<b>30.32</b> (4.76)**	<b>20.96</b> (2.91)*	<b>20.984</b> (2.737)*	<b>18.12</b> (2.33)*
	<b>3.39</b> (2.15)*		<b>2.44</b> (1.314)
		<b>5.836</b> (1.897)	<b>3.4</b> (0.965)
0.575	0.657	0.638	0.655
1.149	1.145	0.908	0.923
0.322	0.116	0.311	0.116
168	168	168	168

Source: outputs of data processing using E-Views 10.

Results don't support any significant effect of discount rate on stock mispricing, as indicated in Models (3) and (4). So, for the third hypotheses, the null hypotheses are accepted and the alternative one could be rejected. For the second hypotheses, results show that “inflation rate” may have a significant effect on stock mispricing with explanation power of 65.7%, as shown in Model (2). All models support the significant effect of “herding behavior” on “stock mispricing”.

Regarding normality, Jarque-Bera test implies that the research variables are normally distributed. Regarding the problem of auto-correlation, Durbin-Watson test has been conducted and shows that auto-correlation problem doesn't exist, as DW stat value is between 1 and 3. Besides, Heteroscedasticity has been investigated using Goldfeld-Quandt test, indicating that this problem does not exist for all models, where tabled value is 5.85.

## V. SUMMARY AND CONCLUSION REMARKS

This paper aims at examining the impact of herding behavior on stock mispricing. Herding behavior is measured by Cross Sectional Standard Deviation (CSSD), while stock mispricing is measured by the distinguish between a stock price and a company's intrinsic value. This has been conducted using a sample of 24 companies are listed at the Egyptian exchange during the period from 2002 to 2018.

Results indicate there is a significant effect of herd behavior on stock mispricing in a bivariate context, while the effect remains significant, even after controlling for inflation rate and discount rate. Besides, the discount rates do not seem to have any significant effects on stock mispricing.

## REFERENCES

- [1] Shusha, A. & Touny, M. (2016). The Attitudinal Determinants of Adopting the Herd Behavior: An Applied Study on The Egyptian Exchange. *Journal of Finance and Investment Analysis* 5(1) 55-69.
- [2] Devenow, A., & Welch, I. (1996). Rational herding in financial economics. *European economic review*, 40 (3-5) 603-615.

- [3] Yousaf, I., Ali, S., & Shah, S. (2018). Herding behavior in Ramadan and financial crises: the case of the Pakistani stock market. *Financial Innovation*, 4(1), 1-14.
- [4] Filip, A., Pochea, M., & Pece, A. (2015). The Herding Behavior of Investors in the CEE Stocks Markets. *Procedia Economics and Finance*, 32, 307-315.
- [5] 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.
- [6] Qasim, M., Hussain, R., Mehboob, I., & Arshad, M. (2019). Impact of Herding Behavior and Overconfidence Bias on Investors' Decision-Making. In Pakistan. *Accounting*, 5(2), 81-90.
- [7] Filiz, I., Nahmer, T., & Spiwoks, M. (2019). Herd Behavior and Mood: An Experimental Study on the Forecasting of Share Prices. *Journal of Behavioral and Experimental Finance*, 24, 100232.
- [8] Hudson, Y. (2015). Investor Sentiment and Herding – An Empirical Study of UK Investor Sentiment and Herding Behavior. Degree of Doctor of Philosophy, School of Business and Economics, Loughborough University's Institutional Repository, UK.
- [9] Trinugroho, I., & Rinofah, R. (2011). The Effect of Mispricing on Investment of Indonesian Firms: Do Financial Constraints Matter. *Middle Eastern Finance and Economics*, 5(9), 13-23.
- [10] Pantzalis, C., & Park, J. C. (2014). Agency Costs and Equity Mispricing. *Asia-Pacific Journal of Financial Studies*, 43(1), 89-123.
- [11] Sakaki, H., Jory, S., & Jackson, D. (2019). Institutional Investors' Ownership Stability and Their Investee Firms' Equity Mispricing. Available at SSRN 3138728. Scientific Research ISSN 2090-4304.P73.
- [12] Christie, W. G., & Huang, R. D. (1995). Following the Pied Piper: Do Individual Returns Herd around the Market? *Financial Analysts Journal*, 51(4).
- [13] Gleason, K., Mathur, I., & Peterson, M. A. (2004). Analysis of intraday herding behavior among the sector ETFs. *Journal of empirical Finance*, 11(5), 681-694.
- [14] Demirel, R., & Kutan, A. (2006). Does herding behavior exist in Chinese stock markets? *Journal of international Financial markets, institutions and money*, 16(2), 123-142.
- [15] 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 (1-2) 61-77.
- [16] Chen, C. R., Lung, P. P., & Wang, F. A. (2009). Mispricing and the cross-section of stock returns. *Review of Quantitative. Finance and Accounting*, 32(4), 317-349.
- [17] Brigham, E. & Ehrhardt, M. (2017). *Financial Management*, 15th Edition, Cengage Learning.
- [18] Gitman, L. (2009). *Principles of Managerial Finance*, 12th Edition, University of Pittsburgh.
- [19] Schoon, N. (2005). *Residual Income Models and the Valuation of Conventional and Islamic Banks*. Degree of Doctor of Philosophy, School of Management of Surrey.
- [20] Tiwari, R. (2016). *Intrinsic Value Estimates and Its Accuracy: Evidence from Indian Manufacturing Industry*. *Future Business Journal*, 2(2), 138-151.
- [21] Blasco, N., Corredor, P. & Ferreruela, S. (2017). Can Agents Sensitive to Cultural, Organizational and Environmental Issues Avoid Herding? *Finance Research Letters* 22 (1).



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