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Research Paper

Investigating the Impact of Investor Heterogeneity on the Simultaneity of Stock Prices and Stock Returns[1]

Mehdi Haj Ebrahimi[2], Hossein Shafiei[3], Abbas sheybani Tazarji[4]

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INTRODUCTION

According to traditional financial theory, a stock's price reflects its fundamental value and future cash flows. In the efficient market hypothesis, investors exhibit rational behavior as they analyze all available information and evidence in order to maximize their expected utility. Consequently, changes in stock prices are influenced by corresponding changes in a company's fundamental values, and irrational investor behavior does not yield returns for them. While some investors may introduce doubt in supply and demand through irrational transactions, rational arbitrageurs offset the impact of these shocks, thus stabilizing stock prices at their fundamental level. Kim and Ha (2010) have shown that investors' judgments in the stock market are comprised of non-scientific information, mental images, and their own mental and emotional conditions. As investors hold varying opinions on asset value, they tend to analyze financial securities uniformly, resulting in similar estimates of the probability distribution of estimated cash flows for existing securities a concept known as homogeneous expectations. However, in reality, investors do not harbor equal expectations about the market nor maintain the market portfolio. As a result, models that encompass this behavioral heterogeneity among investors are necessary. Given the

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2. Ph.D. Student, Department of Accounting, Zahedan Branch, Islamic Azad University, Zahedan, Iran. Corresponding Author. Email: m.haji10@yahoo.com

3. Assistant Professor, Department of Accounting, Sirjan Branch, Islamic Azad University, Sirjan, Iran. Email: hossein.shafii@gmail.com.

4. Assistant Professor, Department of Accounting, Sirjan Branch, Islamic Azad University, Sirjan, Iran. Email: sheybani.abbas@iauk.ac.ir.

complexity of today's financial markets, this research aims to address whether investor heterogeneity affects the simultaneity of stock prices and stock returns.

MATERIALS AND METHOD

The purpose of this research is applied, signifying its intent to have practical implications. The nature of the research is descriptive-correlational, focusing on describing and exploring relationships between variables. Data for testing the research hypotheses were collected using the library method on a daily basis. The statistical model employed in this research is the multivariate regression model. To test the hypotheses, the apparently unrelated regression (SUR) is utilized. This method is chosen because the trading volume in the capital market can impact the trend of stock prices. Therefore, before implementing SUR, it is necessary to examine the interdependence of disturbance components in the equations. If correlation is present, SUR can be used.

The statistical population of the research consists of companies listed on the Tehran Stock Exchange from 2010 to 2017. The sample was selected using the elimination method and based on specific criteria.

RESULTS AND DISCUSSION

The F statistics presented in the table 1 indicate significance at the 5% level of the regression models. The estimated coefficient and t-statistic related to the variable of investor heterogeneity in the research model were positive and significant at the 5% error level, which shows that there is a positive relationship between investor heterogeneity and the simultaneity of companies' stock prices.

Table 1. The results of the first research hypothesis test

$$Synch_{i,t} = \alpha_0 + \beta_1 Pes_{i,t} + \beta_2 SIZE_{i,t} + \beta_3 LEV_{i,t} + \beta_4 MB_{i,t} + \beta_5 BETA_{i,t} + \beta_6 AGE_{i,t} + Year\ fixed\ effect + Industry\ fixed\ effects + \varepsilon_i$$

variable symbol	variable title	**SIG**	t statistic	standard error	Variable coefficient
α	constant value	0.132	1.505	0.358	0.528
PES	investor heterogeneity	0.000	5.258	0.078	0.411
SIZE	Company size	0.000	3.145	0.019	0.062
LEV	Financial leverage	0.000	4.588	0.019	0.088
MB	market value to book value	0.007	2.690	0.212	0.571
BETA	stock beta	0.000	5.072	0.039	0.197
AGE	Company age	0.763	0.300	0.080	0.024
YFE	company-year effects	were controlled			
IFE	year-industry effects	were controlled			
	Watson camera statistic: 1.774	Adjusted coefficient of determination:0.548			
	significance of F statistic: 0.0000	F statistic: 22.451			

Source: Research findings

The F statistics presented in the table 2 indicate significance at the 5% level of the regression models. The Durbin-Watson statistic also shows the absence of an autocorrelation problem. The estimated coefficient and t-statistic related to the variable

of investor heterogeneity in the research model were positive and significant at the 5% error level, which shows that there is a positive relationship between investor heterogeneity and stock returns. Therefore, the research hypothesis is not rejected at the 5% error level. Additionally, all other variables in the research, except for the age of the company, indicate the existence of a significant relationship with the simultaneity of the stock price.

Table 2. The results of the Second research hypothesis test

$$R\_(i,t) = \alpha\_0 + \beta\_1\ \ [\![Pes]\!]\ \_(i,t) + \beta\_2\ \ [\![SIZE]\!]\ \_(i,t) + \beta\_3\ \ [\![LEV]\!]\ \_(i,t) + \beta\_4\ \ [\![MB]\!]\ \_(i,t) + \beta\_5\ \ [\![BETA]\!]\ \_(i,t) + \beta\_6\ \ [\![AGE]\!]\ \_(i,t) + Year\ fixed\ effect + Industry\ fixed\ effects + \varepsilon\_i$$

variable symbol	variable title	**SIG**	t statistic	standard error	Variable coefficient
α	constant value	0.000	4.265	3.675	15.689
PES	investor heterogeneity	0.0487	1.981	0.484	0.960
SIZE	Company size	0.0196	2.348	0.409	0.961
LEV	Financial leverage	0.0003	3.631	0.134	0.490
MB	market value to book value	0.0061	2.765	0.624	1.726
BETA	stock beta	0.0248	2.258	0.0858	0.193
AGE	Company age	0.7659	0.298	0.0482	0.0143
YFE	company-year effects	were controlled			
IFE	year-industry effects	were controlled			
	Watson camera statistic: 1.976	Adjusted coefficient of determination:0.563			
	significance of F statistic: 0.0000	F statistic: 22.536			

Source: Research findings

CONCLUSION

The first hypothesis of the research suggests that investor heterogeneity has an effect on stock price simultaneity. This can be argued in the following way: Investors are constantly monitoring prices and reacting positively to positive returns and negatively to negative returns. When stocks exhibit positive returns, fundamental analysts view it as an indication of favorable economic conditions. According to the Hong and Stein (1999) model, information doesn't spread quickly in the market. As good news gradually becomes known, investors start reacting to it. This behavior leads to investor heterogeneity and ultimately contributes to the simultaneous increase in stock prices.

The result obtained from the second hypothesis of the research suggests that investors exhibit heterogeneous reactions and behaviors towards stock returns. In other words, they tend to buy stocks of winners and stocks of losers, indicating the presence of a chasing effect and a fishing effect at a low level. Buying stocks that have shown positive movement in the past does not yield significant stock returns. However, past

losers generate significantly higher returns due to their low liquidity and low level of heterogeneity among investors. Consequently, stocks with the least amount of investor heterogeneity tend to generate the highest returns for investors after experiencing price declines.

Keywords: Heterogeneity of Investors, Simultaneity of Stock prices, Investor Behavior.

JEL Classification: G29 ,G11, G20.