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IN A SEARCH FOR THE INFLUENTIAL FACTORS OF INVESTORS' BEHAVIOUR

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ABSTRACT

This research aims to explore the impact of interest rates, the M/BV ratio and the financial crisis on investors' behaviour, as captured by the stock market's performance, over the period December 1992 to December 2016. To accomplish the core aim of this study, a set of empirical techniques such as the ADF, Johansen co-integration and VECM tests are employed. Consequently, the findings showed that the used variables are found to be non-stationary at levels, while after converting them into the first difference they became stationary. Results from the Johansen and VECM tests revealed that investors' behaviour as measured by the buffet indicator is significantly impacted by the explanatory variables in the long run. However, when investors' behaviour was captured by the stock market index, no short or long correlation was detected. Additionally, the outcomes confirmed that investors' behaviour was adversely influenced by the financial crisis. Furthermore, the study concludes that investors of Jordan are risk-averse investors.

Keywords: Investors' behaviour, Buffet indicator, M/BV, WATDIR and WASDIR.

INTRODUCTION

The economy of Jordan is a financially-based economy, highly reliant on the performance of the Amman Stock Exchange (ASE from here onwards). For instance, recent statistics revealed that the contribution of markets capitalisation in the country's GDP constituted 65% in 2016, compared with 83% by the end of 2013 (ASE, 2017). However, due to the impacts of deregulation and the series of global financial crises, the economy of Jordan witnessed structure fluctuations pre- and post-financial crisis, and metrics like interest rates and M/BV ratio lie at the heart of these fluctuations. Consequently, the average ratio of the ASE's M/BV increased from 1.12 in 2000 to 2.91 in 2006, before plunging to 1.2 by the end of 2016 (ASE, 2017). On the other hand, interest rates on time deposits accounts fell from 6.55% in 2000 to 2.88% in 2002, before climbing to 6.49% in 2006, and ultimately declining to 3% at the end of 2016. By the end of 2002, the weighted average saving deposits interest rate dropped from 1.8% to 0.99 in 2006, before decreasing to 0.6% by the end of 2016 (CBJ, 2017). However, although notable researchers (Ali, 2016; Al-Ali and Kassem 2013; Ojeaga and Odejimi, 2014) have appraised the importance of interest rates and the M/BV ratio in the process of decision making, the previous researchers have not measured the impact of movements in deposit interest rates, the M/BV ratio or market performance in the perception of Jordanian investors. Beyond that, studies including Mora (2010) proved that during the crisis period investors preferred to liquidate their securities to invest them in less risky investments such as treasury bills and bank deposits. Additionally, measuring the impact of interest rates and the M/BV ratio in the performance of stock markets and investors' behaviour is being studied intensively (e.g. Ali, 2014; Thang, 2009; Aurangzeb, 2012, Uddin and Alam, 2007; Al-Majali and Al-Assaf, 2014; El-Seoud, 2014). However, although many studies shed light on the influential factors of investors' behaviour, the empirical framework confirmed that there is no previous research which identifies the main determinants of investors' behaviour as proxied

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by the performance of the ASE. Additionally, although movements in variables like interest rates and the M/BV ratio have experienced dramatic fluctuations, there is a gap in literature regarding the impact of these financial metrics in the performance of the ASE. Therefore, the current research is mainly intended to identify the impacts of volatility in time and saving deposit interest rates and the average ratio of the ASE M/BV on the behaviour of Jordanian investors, over the period December 1992 to December 2016. The study will also investigate the impact of market performance in the behaviour of Jordanian investors. However, since the economy of Jordan, in common with other developing economies in the region, was adversely impacted by the 2008/11 financial crisis, this study also seeks to understand the impacts of this crisis in the performance of the ASE as a proxy for investors' behaviour.

EMPIRICAL REVIEW

The current research is primarily intended to explore the potential determinants of investors' behaviour as captured by the performance of the ASE. Thus, to cover the theoretical and empirical foundation of this study, the following section presents a critical appraisal of the most recent studies concerning the influential factors of investors' behaviour and the market's performance. These studies are discussed and categorised below:

Stock market performance: related studies

The review of literature has shown numerous studies concerning the influential factors of stock market performance. For example, a study by Zafar (2013) aimed at identifying the influencing factors in the performance of stock markets as measured by the market capitalisation/GDP. The results revealed a negative relationship between the real interest rate and the market performance. However, Khrawish, Siam and Jaradat (2010) found a significant-positive relationship between government prevailing interest rate and the market capitalisation, while the factor of government development was found to be negatively affecting the rate of market capitalisation. Similarly, Ologunde, Elumilade and Saolu (2006) confirmed a positive correlation between the market capitalisation rate and the prevailing interest rate. A study by Thang (2009) confirmed that in the long and short run the stock index of the Malaysian stock market is negatively related to both the interest and the exchange rates. Additionally, the study induced that when the interest rate is high investors prefer to liquidate their securities to deposit them into the banks, and vice versa. Consistent with this, Richard, Adekunle and Ojodu (2012) discovered a negative relationship between the rates of interest and the stock index of the Nigerian capital market. However, Al-Mukit (2012) showed a positive association between the exchange rate and the stock index of Dahaka stock market, while the weighted average saving deposit rate were found to be negatively associated with the stock index. Likewise, Aurangzeb (2012) revealed a negative correlation for the interest rates with the market's performance. Whereas a 1% increase in the deposit interest rates decreases the market's performance by 73%, the decrease in these rates stimulates investors to withdraw their money to invest them in the stock market. Ali (2016) argued that there is no long- or short-run causality running from the volatility in the M/BV ratio towards market liquidity as measured by the value traded and the turnover ratio. The study concluded that financial factors like M/BV ratio do not impact the behaviour of Jordanian investors.

Determinants of investors' behaviours

Numerous studies have been performed to explain the potential determinants of investors' decisions and saving behaviour. For example, a study by Fares and Khamis (2011) found that factors including investor's ages, experience of using the internet, and the level of education significantly affect investors' trading behaviour. Mojgan and Ali (2011) revealed that variables like EPS and DPS play a central role in motivating Persian investors to invest in the

stock market. However, Nagy and Obenberger (1994) showed that variables like expected earnings and risk minimisation are found to be the most influential factors on securities investors. Azam and Kumar (2011) pointed out that factors like E/P, FDI and the real GDP are significantly impacting the stock index of the Karachi Stock Market as a proxy for investors' behaviour. Harsha and Kerav (2012) found that the variables of market capitalisation and past performance are the two most influential factors on investors' decisions in Vadodara and Ahmedabad, while variables like the fluctuations in markets' indices are the least effective determinants of investors' decisions. Acosta and Loza (2005) indicate that investment decisions in Argentina are significantly affected by exchange rates, inflation rates, trade liberalisation and the changes in the levels of aggregate demand, while, in the long-run these decisions are highly influenced by variables such as credit to private sector and external debt. A study by Yamin and Ali (2014) concluded that variables including M/BV ratio are significantly impacting the decisions of Amman Stock Exchange investors.

Financial crisis appraisal

Al-Najjar et al. (2010) found that, although the economy of Jordan, as with other developing economies in the region, was adversely affected by this crisis, the lack of modern financial instruments in the ASE succeeded in mitigating the crisis's impact. Further results revealed that the listed financial sectors recorded a considerable decline due to the decline in the banking sector's index. Similarly, Al-Zyadat and Al-Kharabsheh (2013) revealed that the global crisis influenced the performance of ASE as monitored by stock prices and turnover ratio. Additionally, the higher interest rate resulted in decreasing stock prices and reduced lending activity by Jordanian commercial banks. Likewise, Neaime (2012) found that, since a majority of MENA region countries rely heavily on the FDI and exports to recover budget deficit, countries including Egypt, Jordan, Kuwait, Morocco and the United Arab Emirates were adversely impacted by this crisis, due to the dramatic decrease in the levels of FDI.

RESEARCH METHODOLOGY

Quantitatively, the current research employed empirical techniques including the ADF, Johansen co-integration, VECM and Granger Causality Wald tests to measure the impact of WATDIR, WASDIR, and M/BV ratio in the behaviour of Jordanian investors, as captured by the performance of the Amman Stock Exchange. According to this study, the market performance indicator was typically gauged by utilising both the buffet indicator and the general stock index. However, to examine the impacts of the 2008-11 financial crisis in investors' behaviour, the study constructed a dummy variable that takes two values: the zero value assumes that the financial crisis does not impact the market performance, while the one value confirms that the performance of the ASE was impacted by the financial crisis. Moreover, to achieve the aim of this research, the study used a monthly time series data covering the period December 1992 to December 2016. The study's data were mainly obtained from the statistical bulletins of the Amman Stock Exchange, the Central Bank of Jordan, and the official websites of the Global Economy and the World Bank (ASE, 2017; CBJ, 2017; Global Economy, 2017; World Bank, 2017). However, before running the tests, the data were converted into the logarithm and standard deviation to measure impact of the volatility in the independent variables in the behaviour of the ASE's investors.

RESEARCH HYPOTHESES

To achieve the aim of this study, the following hypotheses were formulated:

First main hypothesis

H₁: There is a significant impact on the volatility in the WATDIR, WASDIR, M/BV and the ASEP in the behaviour of the ASE’s investors.

Second main hypothesis

H₂: The RFC_2008/11 was significantly impacted by the behaviour of ASE’s investors.

MODEL SPECIFICATION

To test the above hypotheses, the following model was developed:

$$\text{Ln ASEP} = \beta_0 \pm \beta_1 \sigma\text{WATDIR} \pm \beta_2 \sigma\text{WASDIR} \pm \beta_3 \left(\sigma \frac{M}{BV} \% \right) \pm \beta_4 \text{ASEP} \pm \beta_5 \text{RFC_2008/11} + \varepsilon_t \dots \dots \dots (1)$$

Where: the ASEP in the left side refers to the logarithm of the ASE's performance as measured by the buffet indicator and the general index of the ASE. Similarly, the ASEP on the right side refers to the market's performance. For instance, if the buffet indicator is employed on the left side, the general index will be used on the other side to examine whether it affects investors’ behaviour as measured by the market performance, and vice versa. σWATDIR refers to the volatility in weighted average time deposit interest rates; WASDIR is the weighted average of saving deposit interest rates; $\left(\sigma \frac{M}{BV} \% \right)$ indicate the market-to-book value ratio; and the RFC_2008/11 refers to the recent financial crisis as a dummy.

ESTIMATION PROCEDURE

The current research employs time series data to achieve the core aims and objectives. Thus, to avoid spurious regression results, the study employed the ADF test to examine the following model:

$$\Delta Y_t = \delta_0 + \delta_1 + \delta_2 Y_{t-1} + \sum_{i=1}^p \alpha \Delta Y_{t-i} + \varepsilon_t \dots \dots \dots (2)$$

Where: $\delta_0, \delta_1, \delta_2$ and α are the parameters to be estimated and ε_t relates to the disturbance term. Thereafter, the study ran the Johansen co-integration test. Consequently, the results found a statistical integration between the variables I (1). Therefore, since the variables are integrated of the same order, this implies the existence of an adjustment mechanism. This adjustment was examined by running the single equation of the restricted vector error correction model “VECM”. The following ECM follows the order of specification of the first model:

$$\begin{aligned} \Delta \text{Ln ASEP}_{it} = & \beta_0 \pm \sum_{i=1}^{k-1} \beta_{1i} \Delta \text{ASEP}_{t-i} \pm \sum_{i=1}^{k-1} \beta_{2i} \Delta \sigma.\text{WATDIR}_{t-i} \pm \\ & \sum_{i=1}^{k-1} \beta_{3i} \Delta \sigma.\text{WASDIR}_{t-i} \pm \sum_{i=1}^{k-1} \beta_{4i} \Delta \left(\sigma.\frac{M}{BV} \% \right)_{t-i} \pm \sum_{i=1}^{k-1} \beta_{5i} \Delta \text{ASEP}_{t-1} \pm \\ & \sum_{i=1}^{k-1} \beta_{6i} \Delta \text{RFC_2008/11}_{t-1} \pm \sum_{i=1}^{k-1} \gamma_1 \sigma.\text{WATDIR}_{t-i} \pm \sum_{i=1}^{k-1} \gamma_2 \sigma.\text{WASDIR}_{t-i} \pm \\ & \sum_{i=1}^{k-1} \gamma_3 \left(\sigma.\frac{M}{BV} \% \right)_{t-i} \pm \sum_{i=1}^{k-1} \gamma_4 \text{ASEP}_{t-1} \pm \sum_{i=1}^{k-1} \gamma_5 \text{RFC_2008/11}_{t-1} \pm \psi_i \varepsilon_{t-1} \pm \\ & \mu_t \dots \dots \dots (3) \end{aligned}$$

Where: $\Delta \text{Ln ASEP}_{it}$ is the first difference operator of the dependent variable. This variable relates to the Amman Stock Exchange performance. $\beta_i: i= 1, \dots, 6$ are the parameters to be estimated and indicate the coefficients of the short-run dynamics. $\gamma_i: i=1, \dots, 5$, parameters refer to the long-run multipliers. $\Psi_i \varepsilon_{t-1}$ is the first lagged period of the error correction term and μ_t refers to the white noise error term with the usual properties. To examine whether the

set of independent variables cause Granger in the performance of the ASE in the long run the above model assumes that the coefficient of error term equals zero. Thus, this null hypothesis is tested against the alternative one, which assumes that the error term $\neq 0$.

VARIABLES' DESCRIPTION AND MEASUREMENTS

First: explanatory variables

The ASE's M/BV ratio

This ratio refers to the average ratio of the ASE's market-to-book value. This ratio was calculated by Al-Dahrawi (2016) as shown below:

$$\text{The average ratio of the ASE's M/BV} = \frac{\text{ASE's market value}}{\text{ASE's book value}}$$

Deposit interest rates

These rates refer to the weighted average of interest rates which are paid by Jordanian commercial banks for customers' time and saving deposits.

The recent financial crisis

This research constructs a dummy variable to measure the impact of the 2008-11 financial crisis on investors' behaviour. This dummy takes two values, 'zero and one'. The 0 value means that the financial crisis does not impact the behaviour of Jordanian investors. However, the one value means that this crisis was significantly impacting investors' behaviour.

Second: dependent variables

Stock markets' performance

To measure the performance of the Amman Stock Exchange two main measures are employed as described below:

Buffet indicator

This is a long-run valuation indicator that is used to measure the stock market's performance, based on market size. This indicator is calculated as shown below:

$$\text{Buffet Indicator} = \frac{\text{Stock Market Cap}}{\text{GDP}} * 100$$

The ASE general index

This is considered as one of the three important indices in the ASE, using 1000 points as a base value. This index is supplemented by sub-indices for the main four sectors: the banking and finance sector, insurance, services, and the industrial sector. The index is calculated by using the market capitalisation of the free float shares of companies. The index consists of 100 listed traded companies. These companies are selected based on the number of traded days and market capitalisation.

RESULTS AND CONCLUSION

This research employs monthly time series data to determine the most influential factors which are impacting the behaviour of Jordanian investors as captured by the market's performance. Thus, to avoid spurious regression results; the study employed the ADF test to check for stationarity. The results showed that all the variables are found to have unit roots when they are tested at levels. However, after converting them into the first difference, the trends were eliminated. Therefore, the study applied the Johansen test, and the results confirmed that there is a statistical integration among the variables of interest. The findings of the error correction model showed that, in the long run, the performance of the ASE as

measured by the general index is not found as Granger caused by the movements in M/BV ratio, the rates of interest and the buffet indicator. Similarly, investors' behaviour as measured by the stock index was not impacted by the recent financial crisis. Additionally, findings from the Wald χ^2 Granger test confirmed that the set of independent variables do not cause Granger on investors' behaviour as measured by the stock market index in the short run. On the other hand, when the performance of the ASE was captured by using the market cap relative to the GDP, results from ECM validated the outcomes of the Johansen test. Therefore, the findings proved that there are long-run causalities running from the M/BV ratio, interest rates and the stock index towards investors' behaviour. The results also showed that the recent financial crisis adversely affected the performance of the ASE as measured by the buffet indicator. However, results from the Wald test showed that there are no short-run correlations between the variables. Furthermore, post-estimation tests including the LM proved that there is no serial correlation in the residual. For the results of the ADF, Johansen, VECM, Wald and the LM tests see tables 1 to 9 in the Appendix.

CONCLUSION

This research was designed to determine the most influential factors of investors' behaviour as captured by the performance of the ASE, over the period December 1992 to December 2016. Thus, after checking for data stationarity, the results showed that when the first difference was added all the variables became stationary of the same order. Thereafter, the study applied the Johansen co-integration test, before running the VECM test. The findings revealed that there is no long- or short-run causality running from the volatility in interest rates, M/BV ratio or the buffet indicator towards investors' behaviour as captured by the stock index. Similarly, the recent financial crisis was not affected the general index of the ASE. The results seem to be consistent with Ali (2016) as they proved that there is no long- or short-run causality running from the M/BV ratio towards the liquidity of the ASE. However, studies (including Yamin and Ali, 2014; Shaban and Al-Zubi, 2014) revealed that the decisions of the ASE are affected by variables like the M/BV ratio. Thang (2009) found a negative short- and long-run integration between interest rates and the stock market indices. Therefore, the study concludes that there may be some other factors affecting investors' behaviour as proxied by the stock index. For instance, Azam and Kumar (2011) documented that factors like E/P, FDI and the real GDP are significantly impacting the stock index of the Karachi stock market as a proxy for investors' behaviour. By contrast, the study shows that in the long run the behaviour of the ASE's investors as measured by the buffet indicator is statistically impacted by the movements in the M/BV ratio, WATDIR, WASDIR and the stock index. These results are consistent with Zafar (2013) as he finds a negative correlation between interest rates and the market performance as measured by the rate of market capitalisation. The results of the current study also documented that the recent financial crisis negatively impacted the performance of the ASE, in agreement with Al-Najjar et al. (2010) and Al-Zyadat and Al-Kharabsheh (2013). Moreover, the study concludes that variables like M/BV, WATDIR, WASDIR and the stock index are commonly used by Jordanian investors to make their investment decisions. However, since the decrease in the M/BV ratio and the WATDIR is found to stimulate investors to invest in the stock market, the study induced that investors of Jordan can be classified as rational or risk-averse investors (see Thang, 2009). Furthermore, since the recent crisis negatively impacted investors' behaviour, the study concludes that during the crisis period investors became more risk-averse as they liquidated their financial securities to invest them in less risky investment opportunities such as bank deposits or bonds. This result is consistent with Mora (2010) who found that during the crisis period investors preferred to liquidate their securities to employ them in less risky investments, such as treasury bills and bank deposits.

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APPENDIX

Table 1. ADF's results

The following table demonstrates that all the time series variables became stationary, only after adding the first difference.

Variable	Level 5%	P-Value	1 st Diff	Remark	H ₀
Cap/GDP	-3.429 -4.126	0.0058	1	I (I)	Rejected
G.Index	-3.429 -3.697	0.0226	1	I (I)	Rejected
M/BV	-3.429 -3.443	0.0459	1	I (I)	Rejected
WATDIR	-3.429 -3.643	0.0264	1	I (I)	Rejected
WASDIR	-3.429 -4.087	0.0066	1	I (I)	Rejected
RFC 2008/11	-3.429 -6.875	0.000	1	I (I)	Rejected

Note: *** indicates that the time series variables are significant at 5 per cent level of significance.

Table 2. Johansen co-integration results

The results revealed a long-run integration between investors' behaviour as measured by the stock index along with the set of independent variables.

**VEC-rank G.Index, M/BV ratio, WATDIR. WASDIR. Cap/GDP, RFC_2008/11, trend(Constant) Lags (3) max
Johansen tests for Co-integration**

Trend: Constant				No. of Obs. = 285
Sample: 1993m4-2016m12				Lags= 3
Maximum				
Rank	Eigen Value	H ₀	Trace Statistics	1% Critical Value
0	.	R=0	106.1	103.1
1	0.1166	R ≤ 1	70.78*	76.07
2	0.0965	R ≤ 2	41.85	54.46
3	0.0782	R ≤ 3	18.63	35.65
4	0.0319	R ≤ 4	9.371	20.04
5	0.0285	R ≤ 5	1.104	6.65
6	0.0038	.	.	.

Table 3. Vector error correction model (VECM)

The results confirmed that there is no long-run integration between the set of independent variables along with the stock market's index.

	Coef.	Std. Error	Z	P > /Z/	99% Cnof.	Interval
D G.Index						
Ce1						
L1	0.0068	0.0017	3.87	0.000	0.0022	0.0113
G. Index						
LD.	0.9939	0.2328	4.27	0.000	0.3943	1.5936
L2D.	-0.0417	0.2326	-0.18	0.858	-0.6408	0.5574
M/BV						
LD.	-0.0070	0.1843	-0.04	0.970	-0.4819	0.4679
L2D.	-0.0157	0.1846	-0.09	0.932	-0.4914	0.4598
WATDIR						
LD.	-0.0019	0.0042	-0.45	0.654	-0.0129	0.0091

L2D.	-0.0020	0.0038	-0.53	0.594	-0.0119	0.0078
WASDIR						
LD.	0.0011	0.0096	0.12	0.906	-0.0236	0.0259
L2D.	-0.0002	0.0090	-0.02	0.980	-0.0235	0.0231
Cap/GDP						
LD.	-0.0398	0.0594	-0.67	0.503	-0.1930	0.1133
L2D.	0.0125	0.0595	0.21	0.832	-0.1407	0.1659
RFC 2008/11						
LD.	-0.0010	0.0019	-0.52	0.604	-0.0061	0.0041
L2D.	-0.0009	0.0018	-0.51	0.607	-0.0055	0.0037
Cons	0.0002	0.0003	0.87	0.382	-0.0005	0.0010

Table 4. Wald results

Results from the Wald test proved that there is no short-run causality running from the independent variables towards investors' behaviour.

Variable	Chi2	Prob>chi2
M/BV	0.11	0.948
WATDIR	1.43	0.488
WASDIR	0.02	0.991
Cap/GDP	1.50	0.827
RFC 2008/11	0.51	0.774

Table 5. LM test

The results of Lagrange-Multiplier Test showed that the examined variables did not present any autocorrelation at lag one or two.

Lag	Chi2	Df	Prob>chi2
1	36.461	36	0.4472
2	49.285	36	0.0690

Table 6. Johansen co-integration results

The results revealed a long-run integration between investors' behaviour as measured by the buffet indicator along with the set of independent variables.

VEC-rank Buffet indicator, M/BV ratio, WATDIR, WASDIR, G.Index, RFC_2008/11, trend(Constant) Lags (3) max
Johansen tests for Co-integration

Trend: Constant				No. of Obs. = 285
Sample: 1993m4-2016m12				Lags= 3
Maximum				
Rank	Eigen Value	H ₀	Trace Statistics	1% Critical Value
0	.	R=0	106.1	103.1
1	0.1166	R ≤ 1	70.78*	76.07
2	0.0965	R ≤ 2	41.85	54.46
3	0.0782	R ≤ 3	18.63	35.65
4	0.0319	R ≤ 4	9.371	20.04
5	0.0285	R ≤ 5	1.104	6.65
6	0.0038	.	.	.

Table 7. Vector error correction model (VECM)

Since the error term is negative and significant, the results validated results from Johansen test. Meaning, that there are long-run causalities running from the independent variables towards investors' behaviour as measured by the buffet indicator.

	Coef.	Std. Error	Z	P > /Z/	99% Cnof.	Interval
D Cap/GDP						
Ce1						
L1	-0.00324	0.00064	-5.00	0.000	-0.049	-0.0157
Cap/GDP						
LD.	0.7725	0.1899	4.07	0.000	0.283	1.261
L2D.	0.0242	0.190	0.13	0.898	-0.465	0.514
M/BV						
LD.	-0.0711	0.5888	-0.12	0.904	-1.587	1.445
L2D.	-0.0980	0.5896	-0.17	0.868	-1.616	1.420
WATDIR						
LD.	-0.0081	0.0136	-0.60	0.551	-0.0434	0.027
L2D.	-0.0071	0.0122	-0.58	0.563	-0.0387	0.024
WASDIR						
LD.	0.0078	0.0307	0.25	0.800	-0.071	0.087
L2D.	0.0072	0.0289	0.25	0.802	-0.067	0.081
G.Index						
LD.	0.2235	0.7434	0.30	0.764	-1.691	2.138
L2D.	-0.0200	0.7428	-0.03	0.978	-1.933	1.893
RFC_2008/11						
LD.	-0.0033	0.0063	-0.52	0.603	-0.0197	0.013
L2D.	-0.0029	0.0057	-0.51	0.613	-0.0177	0.011
Cons	0.0004	0.0009	0.46	0.643	-0.0020	0.002

Table 8. Wald results

Results from the Wald test proved that there is no short-run causality running from the independent variables towards investors' behaviour.

Variable	Chi2	Prob>chi2
M/BV	0.57	0.750
WATDIR	2.06	0.357
WASDIR	0.34	0.845
G.Index	1.76	0.881
RFC_2008/11	1.24	0.872

Table 9. LM results

This table demonstrates results from Lagrange-Multiplier Test, which is applied to examine the status of autocorrelation at lag among the examined variables. Consequently, the results did not present any autocorrelation in the residual, neither at lag one nor at lag number two.

Lag	Chi2	Df	Prob>chi2
1	36.46	36	0.447
2	49.28	36	0.069