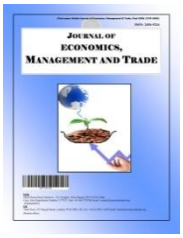

Journal of Economics, Management and Trade

28(9): 54-66, 2022; Article no.JEMT.90142
ISSN: 2456-9216
(Past name: British Journal of Economics, Management & Trade, Past ISSN: 2278-098X)

Testing the Relationship between Trading Noise and the Performance of Financial Markets: A Case Study on the Iraqi Stock Exchange

Nameer Ameer Jasim Alsaygh [a*#] and Doaa Noman Mohammed Alhusseini [a#]

[a] College of Administration and Economics, Mosul University, Iraq.

Authors' contributions

This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.

Article Information

DOI: 10.9734/JEMT/2022/v28i930439

Open Peer Review History:
This journal follows the Advanced Open Peer Review policy. Identity of the Reviewers, Editor(s) and additional Reviewers, peer review comments, different versions of the manuscript, comments of the editors, etc are available here: https://www.sdiarticle5.com/review-history/90142

Original Research Article

Received 23 June 2022
Accepted 03 August 2022
Published 09 August 2022

ABSTRACT

The objective of this study is to examine the greatest number of behavioral variables for the financial markets, whether they are independent or intertwined. Additionally, the most significant effects that these behaviors are likely to have on the performance indicators of the Iraqi Stock Exchange are highlighted. To reach this goal, the study posed the following question: "Can models of financial behavior and its variables, including noise trading, explain the changes in the behavior of capital markets, specifically the Iraq Stock Exchange?". The Iraqi Stock Exchange market took an intentional sample to study the phenomenon of noise trading for the duration (2010-2020) which was observed on a monthly basis and for two separated time periods. To analyze the data, the study adopted (ARDL) and the program Eviews version 10 was used. The research concluded that the first period proved the existence of a long-term equilibrium relationship between noise indicators and recorded price indicators. While it became apparent in the second period that the noise indicators were more precise than in the first, the number of shares traded and the turnover rate were among the most influential noise indicators. The research emphasized the need of monitoring all performance indicators and trading for the market as a whole, as opposed to depending on a subset of indicators and for brief intervals.

[#] Assistant Professor
**Corresponding author: E-mail: Nameer_alsaigh@uomosul.edu.iq;*

Keywords: Noise indicators; financial behavior; trading noise.

1. INTRODUCTION

The financial theory, with its accumulated knowledge and surrounding debate, continues to demonstrate its capacity to explain the performance of capital markets and even the prices of financial assets, and to act almost independently of the purely economic interpretations governed by supply and demand, transaction costs, alternative opportunities, and certain movements in macroeconomic indicators. Numerous models and indicators concur that the aforementioned economic fundamentals are among the package of controlling variables, and that the openness to the fundamentals of capital markets is necessary to realize the behavioral dimension of such fundamentals, regardless of whether it is repeated with patterns or even renewed phases and calibrated in order to be absorbed by investors, companies, or sectors.

Consequently, noise trading has become a prominent example of such behaviors, necessitating criteria, assumptions, and treatments for the correction of absolute and relative volume aggregates within the entire market. Historically, it can be said that this type of trading corresponds to the cut-off point in the development of macro financial theory 1990. Based on the work of numerous scholars specialized in the performance and behavior of the markets, especially Shalfer and his colleagues, whose conducted a study titled as "Noise trader risk in financial market" and was the first guide to identifying this sort of trading. Despite the fact that many scholars have followed in the footsteps of these researchers, they have not been able to replicate the paper's success due to its emphasis on the inclusion of risk and the fact that risk is a quantifiable behavior that dates back to some individual and institutional practices as well as the behavior of some portfolio managers or investment funds in the 1950s.

The research was divided into several sections, the first included its methodology, followed by the review of the concepts around noise trading. The third section included the relationship between market efficiency and this type of trading, and the fourth section was devoted to include the most important discrepancies with traditional trading, while the fifth section contained the requirements and effects of noise, all the way to end with the standard model that tests the relationship between noise indicators and market performance.

2. RESEARCH PROBLEM

The process of finding a suitable alternative to explain the behavior of the prices of some financial assets for the previously presented options is not simple due to the difficulty of meeting the condition of being compatible with the logic of the market first and the ability to predict even a small portion of the future performance scenario with the presence of standard models with financial variables and intangible outputs irrespective of their value and its direction. The research problem can be formulated as follow: Can models of financial behavior and its variables, including noise trading, explain the changes in the behavior of capital markets, specifically the Iraq Stock Exchange?

3. RESEARCH OBJECTIVES

The research aims to achieve the following:

1. Covering the conceptual component of financial behavior that noise trading represents.
2. Discuss as many market behavioral elements as feasible, regardless of whether they are independent or interdependent.
3. Highlighting the most significant effects that these behaviors are likely to have on the performance indicators of the Iraqi Stock Exchange.
4. Reaching the most influential noise indicators in the behavior of the Iraqi Stock Exchange.

4. RESEARCH IMPORTANCE

The importance of the research is represented by tackling a modern approach that contributes to understanding and explaining the behavior of financial markets in general. In addition, it reviews recent trends regarding the consideration of commodities as financial assets such as oil and gold, and some applications of portfolio theory to explain the changes in exchange rates, as they are subjected to the same trend in assessing return, risk, and timing of cash flows.

5. RESEARCH HYPOTHESIS

Based on what was stated in the research problem and aligned with its objectives and importance, the researchers hypothesize that a package of noise trading variables that are based on the variations in its indicators is likely to affect the behavior and performance of the Iraqi stock market in terms of the prices, volumes, and trades (entities, company, sector, market).

6. METHODOLOGY

6.1 Temporal and Spatial Boundaries

As mentioned above, the Iraqi Stock Exchange took a purposive sample to study the phenomenon of noise trading. Tests are conducted for the time (2010-2021) with monthly observations and for intermittent periods.

6.1.1 First: The theoretical framework for noise circulation

Investors in the capital markets seek to discover any pattern of market trends to reach a faster and clearer understanding of the movement of prices, volumes, and trading. This understanding depends in its contents on the technical and fundamental analysis, as well as the timing, source, reliability and reflection of the information in the market index. Hence, the reactions of investors are distinguished. Some of the investors rely on technical analysis due to their belief in the ability of this analysis to detect the patterns based on several hypotheses, the most important of which is that history repeats itself and that the market is the most appropriate financial environment for pricing, discovery and evaluate the work of the system of return and risk, and most importantly knowing the timing of cash flow. on the other hand, the analysis ensures the inclusion of financial information about the company's position and financial performance over a period of time and Its flows and balances which are included in the reports and financial statements, moreover, it includes insight into the financial managers' trends and horizons, and if it is assumed for the sake of argument that the available information, whether it is from the market or sectors or even companies, the noise trading is represented by those situations in which investors are unable to absorb and understand the information, which guides them to make and take wrong decisions, and they become unable to distinguish between what is real or not, and even if they possess the real information, their feelings and emotions are what lead them to make a financial decision [1,317-324].

Earlier, Fang and his colleagues in the year 2019 discussed this phenomenon, assuming that it is one of the pillars of the structure of modern capital markets, and this assumption is due to the fact that there is a large amount of information, coming from different sources and varies in timing made trading noise inevitable, so it is a random buying and selling process that may be for the purposes of liquidity, speculation, or even without specific goals, in which individuals, companies, or even intermediary institutions may participate in it as a seller or as a buyer. In the first case, it enters the market by relying on some wrong or even correct information, but it is led by feelings of optimism and pessimism, and in the second case, when the company announces its decisions, directions and plans to exploit the financial conditions of competing companies [2,1-45].

The 90s era is one of the most important turning points in the framing of this phenomenon, this was emphasized by Palomino believes that noise traders are the ones who think that they have special and privet information about prices If the markets were efficient and the information available with credibility, transparency and appropriate timing, the role of these traders would be minimal Because these traders will expect a high growth rate and high returns, no matter how weak and declining the performance of the assets. This phenomenon starts from their short-term horizon, which in most cases does not exceed the medium term because the deviations in their decisions become apparent after a period of time that is often longer than the average term [3,1-40].

6.1.2 Second: Noise and market efficiency

It is not a secret to researchers that there are many requirements to achieve market efficiency, and this efficiency may penetrate or be achieved from time to time in the capital markets, such requirements might include the necessity of having parallel fluctuations, up and down, between the prices of financial assets and their real values, and that they are expressive of each other. Noise causes the first violations of this efficiency, which causes deviations of values from their reality, and as a result, there is a need for an additional effort to reach them. Noise trades represent accumulations caused by some

traders who make and take financial decisions based on distorted information, in which noise may be targeted or not, but it has already become part of the market structure [4,1-7].

The efficiency of the market often indicates that the market, in general, does not allow the reaping of profits higher than the average market return, and there is no need for market penetration status (Beat the market) by traders, particularly in the short term [5, 1-15] which is what noise traders make, so it is an efficiency that is not limited to a specific financial asset, but that Milton Friedman, in his discussions about exchange rates, mentioned that there are two types of traders, one of which disturbs the balance of the market and the other is correcting it. This situation happens due to the fact that in both cases they take the opposite action which is referred to as speculators [6, 157].

6.1.3 Third: The difference between noise trading and traditional trading

Some financial literature, specifically those that linked efficiency and noise together and even some frameworks for technical analysis, as well as some recent books on commodities such as oil, exchange, and gold, have revealed that there are fluctuations caused by noise behaviors and the reactions related to the situation of disrupting and correcting the market and taking the opposite situation. Two types of traders are summarized in Table 1 which represents the differences that help to distinguish between traditional trading (arbitrage) and unconventional trading (noise).

Table 1. The differences between noise and traditional trading

#	Traditional trading	Noise trading
1	It is based on a sufficient amount of quantitative and non-quantitative information about the company, the sector, the market and its owners to have their expectations about the minimum limits of the expected returns.	Financial decisions (finance and investment) are made based on tastes, fads, feelings, and unreal or non-justified influences within the financial and economic logic.
2	Its supporters are aware of the existence of random and unrealistic buying and selling movements, and their main interest is in the implications of the basic analysis of the company and the sector.	Those who hold this view believe that noise will generate noise regardless of its source and type, and thus they rely on technical analysis.
3	The behavior of this trading can be studied sequentially and there is no need to separate the periods and by any technique.	It can be observed and tracked over separate time periods, whether convergent or divergent, within time series, cross sections, or even longitudinal data.
4	Emphasis on the timing, source, reliability and cost of the information within the financial reporting package for the balance sheet and the disclosure of income, flows and retained earnings. Despite all this, the trader may still be exposed to a loss.	The sources of information in it are misleading and the signals generated by it are wrong because there is a defect in the beliefs that drive decisions, which results in wrong decisions, even if they are sometimes profitable.
5	A cumulative and uninterrupted behavior because it is trading that creates value.	The behavior is temporary across certain periods and is diagnosed by volumes, trades, prices, and even market liquidity.
6	More disciplined behavior is directly related to the correction of price movement.	Contributes to raising the level of random price movement and the accumulation of imbalances and pricing deviations.
7	The presence of traders as a correction factor eliminates any deviations because their expectations are limited to a certain range.	It is assumed that there are traders who seek to influence in an extreme way in the short term, intentional or otherwise.
8	It is possible for the decision maker to follow their behavior because their money is smart and build their portfolios on several bases, including diversification and arbitrage, and not on just emotions and feelings.	Misleading the financial decision maker because the trading decisions in it do not depend on the state of the market, whether it is a Bull Market or Bear Market.

Source: Prepared by the researchers based on: [7,1,4,8,9,10,11]

6.1.4 Fourth: Requirements and effects of noise

Uncovering the volume and impact of noise trading is one of the challenges facing those interested in capital markets of all kinds, and even countries, whether they are developed, emerging, or even underdeveloped. This can be traced to the noise short-term movement and the ambiguity of the timings of exit and entry to the market. Furthermore, noise needs continuous follow-up to the procedures of the market, which may be a direct or indirect cause of it. There are some conditions that, if achieved, we can confirm trading noises in the markets, sectors, companies, and even for the financial asset alone. These conditions include:

1. Unusual (abnormal) returns are achieved in a specific period, but it is mostly short-term and extends to the medium-term, and the momentum of these returns disappears in the long-term [1, p317-324].
2. Fong [1] concluded that bad news affects the price as a first stage and that the effect of good news is affecting the trade volumes, specifically if both effects are classified outside the normal distribution. The two cases referred to are adopted by noise traders despite their inaccuracy in entering and exiting the market for investment and financing [1,p1-7].
3. Noise trade is short-term, and the profit is quick and random, the returns and risk are double, and it leaves an impact on stock prices.
5. Noise traders might be individuals, institutional companies, or investment portfolios and they are all collected by false or correct sources of information which are used incorrectly by them [12,p703-737].
6. If diagnosed, it is likely to make the market more transparent in its dealings, because it controls the irrational or random part of the price movement.
7. Noise trades are continuous, but at intervals which creates a momentum that is diagnosed during these periods and affects the market as a whole and results in liquidity.
8. Statistically, the serial correlation is zero, meaning that the relationships do not interact with each other and that the variance is equal to one which means that the results are distributed naturally.
9. it records a weak correlation with economic fundamentals such as supply and demand, or even market fundamentals such as pricing and evaluation, and that the overall performance, not the detailed one, is recorded as weak or regressing, all because of emotion, feelings, extremism and excessive confidence which are the powers which drive noise trading [11,1-68].
10. The behavior of noise traders must be regular and not cancel each other out and may resemble herd behavior in order to ensure influence in the market.
11. it last in the market for long periods not only to lose but to wait as long as possible to achieve profits [13,383-417].

7. RESULTS AND DISCUSSION

Based on the above-mentioned conditions and to achieve noise trading within the growing relative weight of the total capital market trading, and in general, this growing relative weight can leave several effects, which are often described as the movement of small particles around a large body, as they move randomly, irregularly and continuously they create a difference in investor returns, especially the arbitrageurs. The continuation of such a trend and the increase in its momentum causes a breach in the market efficiency in terms of the ability to achieve higher returns -specifically in the short term- higher than the market returns and transforming it from a complete market to an incomplete market that lacks efficiency [3,1-40].

On the other hand, Shah and Malik [14] focused on the risks generated by such behaviors as they achieve gaps in the procedures system and considered as one of the sources of risk which start an instability in the market due to the randomness of sources and the disorder of the financial decision [14,p59-85], and such procedures might become a source of risk when its not well applied and allow some practices of this kind, which are discovered after a period of time when the market liquidity suddenly accumulates from the impact of individuals, companies, institutions, or even owners of investment funds or portfolios, behave in a norm close to each other and for a period of time not, and in a large trading volume [15, p1-24], which causes abnormal returns (mentioned in the 1st point or the requirements) and reach successive positions to liquidate the market in short periods of time that may not exceed a few weeks within the herd approach [16]. These cases are generally corresponding to retail trades, small deals, electronic orders, the net investment fund

flows, and the rise in the total value of retail trades within the net total of trades [11,p1-68].

Another effect of noise trading is the difficulty of identifying it and separating it from traditional trading or the arbitrage trades conducted on a continuous or daily basis. Such a challenge accumulates the difficulties of being able to predict market conditions due to its dependence on the language used, negative and positive attitudes, private information, and tone of voice. Indicators prepared for diagnosing such trades, even if they are available, are difficult to track due to their need for relative and absolute information on the numerator, denominator and differences between the highest and lowest prices, volume differences, closing, and opening rates, turnover rates, momentum indicators, statistical measures of dispersion such as skewness and flatness, interpretation of survey results and forecasts of future profits, whether for a financial asset or asset such as exchange rates and oil, or even for the market as a whole [10, p1-38] and [5, p1-15].

7.1 Fifth: Description of the Variables Used in the Model

To prove whether the hypothesis is valid or not, and to reach the main objective of the research, and to support the results of the analysis described earlier, the econometric model will be designed and described as follows:

X1 is the previous closing price, X2 is the current closing price, X3 is the current opening price, X4 is the highest price, X5 is the lowest price, X6 is the number of shares traded, X7 is the stock turnover, X8 is the current opening price - the last closing price, X9 the margin of the highest and lowest price, and finally Y expressing the market price index.

Before entering the model tests, we will present a table showing the time-series state test for the research variables according to the results of the Phelps-Peron test (PP), which was taken for all models, as it is more accurate.

It is clear from the previous table that the explanatory variables and the dependent variable have passed the Stability Test in general, except for the market price index, which stabilized after taking the first difference.

7.2 The First Period

Estimation and analysis of the relationship between stock market noise and market index for the period 2010-2015.

7.2.1 Slowed time-gap autoregressive model test ARDL

After the stability tests that were conducted on the economic variables (the stock market noise factors) (X1,X2,X3,X4,X5,X6,X7X,8X,X9) as explanatory variables and the market index (Y) as the dependent variable, and it was found that it was stable at the level and at the first difference (1). With this condition met, the ARDL model test can be applied and the Table 2 shows the test results.

Table 3 reports that the ARDL model automatically determines the degrees of time delay for the variables. The results of (Adjusted R-squared) showed that not all the explanatory variables were able to explain (95%) of the changes in the market price index, but rather the focus was on the price itself and the number of traded shares and that (5 %) is due to other factors not included in the model. As for the (F-statistic), it indicates the overall significance of the model from the statistical point of view at a probability level that amounted to (Prob = 0.01), less than 5%, and the (D-W) statistics indicate that its value reached (1.899471) which explains that the model is free from the problem of autocorrelation.

7.2.2 The results of the boundary test for co_integration

To test the existence of a long-run equilibrium relationship (the existence of co-integration) between the explanatory variables and (Y). As a dependent variable, a bound test must be conducted. If the value exceeds the maximum tabular value, this means that there is a joint integration relationship between the explanatory variables and the dependent variable, and if it is between the two values, the situation is critical and doubtful, and if it is less than the minimum value, it is not integrated. The Table 4 shows the results.

It is noted from the Table 4 that the value of (F-statistic) reached (9.209840), which is greater than the maximum and minimum tabular value, as they reached (3.21) (2.17) at a (5%) level of significance, which means that we reject the null hypothesis and accept the alternative hypothesis, and this means that there is a joint integration relationship between (X1,X2,X3,X4,X5,X6,X7X,8X,X9) (Y), thus, reporting a long-term equilibrium relationship.

Table 2. Statistical results of Phillips-Perron test

Variables	Stability test					
	Level			(1st difference)		
	PP	Sig.	Results	PP	Sig.	Results
market price index(-1)	1.584898	0.9994	No stationary	-8.636558	0.0000	Stationary
previous closing price	-8.277928	0.0000	stationary	-36.12921	0.0001	Stationary
current closing price	-8.228535	0.0000	stationary	-36.03602	0.0001	Stationary
current opening price	-7.620188	0.0000	stationary	-20.29945	0.0001	Stationary
the highest price	-7.521362	0.0000	stationary	-49.45472	0.0001	Stationary
lowest price	-7.609960	0.0000	stationary	-16.16218	0.0001	Stationary
The number of shares traded	-7.432325	0.0000	stationary	-26.78734	0.0001	Stationary
stock turnover ratio	-6.573262	0.0000	stationary	-21.93785	0.0001	Stationary
Current Opening Price - Previous Closing Price	-8610832	0.0000	stationary	-33.74467	0.0001	Stationary
Maximum margin and lowest price	-7.348087	0.0000	stationary	-34.30805	0.0001	Stationary

Source: The table is prepared by researchers based on the outputs of EViews.10

Table 3. Test results of the ARDL model

Dependent Variable: Y
Method: ARDL
Date: 04/05/22 Time: 11:11
Sample (adjusted): 2010M02 2015M12
Included observations: 70 after adjustments
Maximum dependent lags: 1 (Automatic selection)
Model selection method: Akaike info criterion (AIC)
Dynamic regressors (0 lag, automatic): X1 X2 X3 X4 X5 X6 X7 X8 X9
Fixed regressors: C

Variable	Coefficient	std. Error	t-Statistic	Prob.*
market price index (-1)	1.021578	0.029648	34.45656	0.0000
previous closing price	-0.430445	0.294294	-1.462635	0.1487
current closing price	0.288344	0.245035	1.176745	0.2439
current opening price	-0.353204	1.424941	-0.247873	0.8051
the highest price	0.115148	0.480177	0.239803	0.8113
lowest price	0.365987	1.593975	0.229607	0.8192
The number of shares traded	1.56E-10	9.03E-11	1.726256	0.0894
stock turnover ratio	-0.059556	0.045523	-1.308267	0.1957
Current Opening Price - Previous Closing Price	0.036763	0.049470	0.743140	0.4600
Maximum margin and lowest price	0.010146	0.206411	0.049152	0.9609
C	-1.665930	2.870084	-0.580446	0.5638
R-squared	0.961486	Mean dependent var		98.26257
Adjusted R-squared	0.956435	SD dependent var		10.93787
SE of regression	2.282982	Akaike info criterion		4.608363
Sum squared resid	317.9323	Schwarz criterion		4.897455
Log likely	-152.2927	Hannan-Quinn criter.		4.723194
F-statistic	190.3544	Durbin-Watson stat		1.899471
Prob(F-statistic)	0.0000000			

*Note: p-values and any subsequent tests do not account for model

Source: The table is prepared by researchers based on the outputs of EViews.10

Table 4. Results of border test

Statistical test	Calculated value	The number of independent variables K
F-statistic	9.209840	9
(Critical Value Bound)		
Significant	**I0 Bound**	**I1 Bound**
10%	2.89	1.92
5%	3.21	2.17
2.5%	3.51	2.43

Source: The table is prepared by researchers based on the outputs of EViews.10

7.2.3 Estimated parameters test (short term)

This test shows the estimation of the short-term parameters in order to detect the degree of influence of the independent variable on the dependent variable, and this test shows the error correction coefficient (UECM) which measures the speed of the model's return to equilibrium in the long term. The Table 5 shows the results:

Through Table 5 estimation of the parameters of the independent variable in the short term was reported, that there is an existence of a negative relationship with a statistical significance between the dependent variable (Y), and the independent variables (X1, X3, X7), and there is a direct positive statistically significant relationship between the dependent variable (Y) and the independent variables (X2, X4, X5, X6, X8, X9).

The estimated relationship also showed that the value of the unconstrained error correction coefficient (UECM) was negative (-0.035920), and significant, with a probability (Prob = 0.0245). This indicates the existence of an

equilibrium relationship in the short term between the variables (X1,X2,X3,X4,X5,X6,X7X,8X,X9) and (Y) and toward an equilibrium relationship in the long run, and the value of the error correction coefficient means that the equilibrium imbalance (short-term imbalance) in (Y) in the previous period (t-1) can be corrected in the current period (t) towards the long equilibrium relationship due to any shock or change in the independent variable, and the error correction coefficient is relatively high, meaning that (Y) takes approximately (3.15) 3 months and a half towards the equilibrium value due to any shock in the model or change in the independent variable.

7.2.4 Test the estimated parameters (long-term)

This test shows the estimation of the parameters in the long-term in order to reveal the degree of influence of the independent variable on the dependent variable, as well as to determine the type of long-term relationship, as in the following Table 6.

We note through Table 6 the results of estimating the parameters of the independent variable in the long-term, as the table shows that there is an inverse (negative) relationship with statistical significance between the dependent variable (Y), and the independent variables (X2, X3, X6, X8, X9), and there is a direct (positive) statistically significant relationship between the dependent variable (Y) and the independent variables (X1, X4, X5, X7) and the dependent variable (Y), which Confirms the validity of what was stated on the theoretical side in terms of the disappearance of the momentum of variables in the long-term.

Table 5. Results of estimating the error correction model and the short-term relationship

Method: ARDL				
Variable	**Coefficient**	**std. Error**	**t-Statistic**	**Prob.***
market price index(1-)	1.021578	0.029648	34.45656	0.0000
previous closing price	-0.430445	0.294294	-1.462635	0.1487
current closing price	0.288344	0.245035	1.176745	0.2439
current opening price	-0.353204	1.424941	-0.247873	0.8051
the highest price	0.115148	0.480177	0.239803	0.8113
lowest price	0.365987	1.593975	0.229607	0.8192
The number of shares traded	1.56E-10	9.03E-11	1.726256	0.0894
stock turnover ratio	-0.059556	0.045523	-1.308267	0.1957
Current Opening Price - Previous Closing Price	0.036763	0.049470	0.743140	0.4600
Maximum margin and lowest price	0.010146	0.206411	0.049152	0.9609
C	-1.665930	2.870084	-0.580446	0.5638
CointEq(-1)*	-0.035920	0.015610	2.301040	0.0245

Source: The table is prepared by researchers based on the outputs of EViews.10

Table 6. Results of estimating long-term parameters

Levels Equation **Case 2: Restricted Constant and No Trend**				
Variable	**Coefficient**	**std. Error**	**t-Statistic**	**Prob.**
previous closing price	840.7705	7927.495	0.106058	0.9160
current closing price	-834.6991	7885.968	-0.105846	0.9162
current opening price	-812.9527	8002.685	-0.101585	0.9196
the highest price	227.5000	2212.063	0.1102845	0.9186
lowest price	624.2402	6214.037	0.100456	0.9204
The number of shares traded	-5.01E-08	4.87E-07	-0.102885	0.9185
stock turnover ratio	22.26388	214.1184	0.103979	0.9177
Current Opening Price - Previous Closing Price	-1.023487	1.439597	-0.710954	0.4796
Maximum margin and lowest price	-0.282450	5.733858	-0.049260	0.9609
C	-98.51886	1809.149	-0.054456	0.9568

Source: The table is prepared by researchers based on the outputs of EViews.10

7.3 Second Period

Estimation and analysis of the relationship between stock market noise and market index for the period 2016-2021.

7.3.1 Slowed time-gap autoregressive model test ARDL

After the stability tests that were conducted on the stock market noise indicators (X1,X2,X3,X4,X5,X6,X7X,8X,X9) as explanatory variables and the market index (Y) as the dependent variable, it was found that it was stable at the level and at the first difference (1). With this condition met, the test of the ARDL model can be conducted. The Table 7 shows the test results for this model.

Table 7 shows us that a ARDL model automatically determines the degrees of temporal deceleration for the variables. The results of the (Adjusted R-squared) test showed (X1,X2,X3,X4,X5,X6,X7X,8X,X9) as independent variables explained (94%) of the changes occurring In the dependent variable (Y), and that remaining (6%) was due to other factors not included in the model. As for the (F-statistic) test, it indicates the overall significance of the model from a statistical point of view at a probability level of (Prob = 0.000000), less than 5%, And the statistics of (D-W) indicate that it reached its peak on (2.136298), and this explains that the model is free from the problem of autocorrelation.

7.3.2 The results of the boundary test for cointegration

The bound test needs to be conducted to test the existence of a long-run equilibrium relationship (the existence of co-integration) between (X1,X2,X3,X4,X5,X6,X7X,8X,X9) as the independent variables and (Y) as the dependent variable. The results are shown in the following Table 8.

Table 7. Test results of ARDL model

Dependent Variable: Y
Method: ARDL
Date: 04/05/22 Time: 23:49
Sample (adjusted): 2016M02 2021M12
Included observations: 71 after adjustments
Maximum dependent lags: 1 (Automatic selection)
Model selection method: Akaike info criterion (AIC)
Dynamic regressors (0 lag, automatic): X1 X2 X3 X4 X5 X6 X7 X8 X9
Fixed regressors: C

Variable	Coefficient	std. Error	t-Statistic	Prob.*
market price index(-1)	0.980172	0.031467	31.14946	0.0000
previous closing price	-21.80832	25,54470	-0.853732	0.3965
current closing price	26.01141	15.33788	1.695893	0.0949
current opening price	12.40426	26.70091	0.464563	0.6439
the highest price	9.143091	12.88687	0.709489	0.4807
lowest price	-29.82880	15.37488	-1.940100	0.0569
The number of shares traded	9.92E-10	2.70E-10	3.672659	0.0005
stock turnover ratio	-1.674695	0.511819	-3.272046	0.0017
Current Opening Price - Previous Closing Price	-4.735181	28.5969	-0.166090	0.8686
Maximum margin and lowest price	-2.232442	5.390361	-0.414154	0.6801
C	11.58761	18.73856	0.618383	0.5386
R-squared	0.947589	Mean dependent var		606.2355
Adjusted R-squared	0.940827	SD dependent var		63.62837
SE of regression	15.47794	Akaike info criterion		8.434685
Sum squared resid	14853.13	Schwarz criterion		8.721503
Log likely	-290.4313	Hannan-Quinn criter.		8.548743
F-statistic	140.1211	Durbin-Watson stat		2.136298
Prob(F-statistic)	0.0000000			

*Note: p-values and any subsequent tests do not account for model

Source: The table is prepared by researchers based on the outputs of EViews.10

Table 8. Results of the boundary test

Test statistic	Value	The number of independent variables K
F-statistic	2.952649	9
(Critical Value Bound)		
Significance level	**I0 Bound**	**I1 Bound**
10%	2.89	1.92
5%	3.21	2.17
2.5%	3.51	2.43

Source: The table is prepared by researchers based on the outputs of EViews.10

Table 9. Results of estimating the error correction model and the short-term relationship

Conditional error correction regression				
Variable	**Coefficient**	**std. Error**	**t-Statistic**	**Prob.**
C	11.58761	18.73856	0.618383	0.5386
market price index (-1)	-0.019828	0.031467	-0.630109	0.5309
previous closing price	-21.80832	25,54470	-0.853732	0.3965
current closing price	26.01141	15.33788	1.695893	0.0949
current opening price	12.40426	26.70091	0.464563	0.6439
the highest price	9.143091	12.88687	0.709489	0.4807
lowest price	-29.82880	15.37488	-1.940100	0.0569
The number of shares traded	9.92E-10	2.70E-10	3.672659	0.0005
stock turnover ratio	-1.674695	0.511819	-3.272046	0.0017
Current Opening Price - Previous Closing Price	-4.735181	28.5969	-0.166090	0.8686
Maximum margin and lowest price	-2.232442	5.390361	-0.414154	0.6801
CointEq(-1)*	-0.019828	0.003620	-5.477474	0.0000

Source: Table of numbers of researchers based on the outputs of EViews.10
** p-value incompatible with t-Bounds distribution,*
*** Variable interpreted as Z = Z(-1) + D(Z)*

It is noted from the above Table 8 that the value of (F-statistic) reached (2.952649), which is greater than the maximum and minimum tabular value, as it reached (3.21) (2.17) at a significant level of (10%), which means that we reject the null hypothesis and accept the alternative hypothesis, and this means that there is a joint integration relationship between (X1,X2,X3,X4,X5,X6,X7X,8X,X9), (Y), which prove the existence of a long-term equilibrium relationship.

7.3.3 Estimated parameters test (short-term)

This test shows the estimation of the short-term parameters in order to detect the degree of influence of the independent variable on the dependent variable, and this test shows the error correction coefficient (UECM), which measures the speed the model takes to return to the equilibrium in the long term, and the Table 9 reflects the results:

We note through Table 9 the results of estimating the parameters of the interpreted variables in the short term, as the table shows the existence of an inverse (negative) relationship with statistical significance between the dependent variable (Y), and the independent variables (X1, X5, X7, X8, X9), and there is a direct (positive) statistically significant relationship between the dependent variable (Y) and the independent variables (X2, X3, X4, X6) and the dependent variable (Y).

The estimated relationship also showed that the unconstrained error correction coefficient (UECM) has a negative and significant value of (0.019), with a probability of (Prob= 0.0000), and this indicates the existence of an equilibrium relationship in the short term between the variables (X1,X2,X3,X4,X5,X6,X7X,8X,X9) and (Y) with a directional equilibrium relationship in the long-term, and the value of the error correction coefficient means that the equilibrium imbalance (short-term imbalance) in (Y) in the previous period (t-1) can be corrected in the current period (t) towards the long-term equilibrium relationship due to any Shock or change in the independent variable, and the error correction coefficient is relatively high, meaning that (Y) takes approximately (1.30) a month and a half towards the equilibrium value due to any shock in the model or change in the independent variable.

Table 10. Results of estimating long-term parameters

Levels equation
Case 2: Restricted constant and no trend

Variable	Coefficient	std. error	t-Statistic	Prob.
market price index (-1)	-1099.903	2256.179	-0.487507	0.6276
previous closing price	1311.885	2291.890	0.572403	0.5691
current closing price	625.6089	1789.233	0.349652	0.7278
current opening price	461.1318	978.6647	0.471185	0.6392
the highest price	-1504,416	2706.427	-0.555868	0.5803
lowest price	5.00E-08	7.86E-08	0.636136	0.5270
The number of shares traded	-84.46324	133.2050	-0.634085	0.5284
stock turnover ratio	-122.4758	734.1795	-0.166820	0.8680
Current Opening Price - Previous Closing Price	-57.74227	146.5175	-0.394098	0.6948
Maximum margin and lowest price	584.4209	159.6008	3.661766	0.0005
EC = Y - (-1099.9025 * X1 + 1311.8853 * X2 + 625.6089 * X3 + 461.1318 * X4 -1504.4157*X5 + 0.0000*X6 -84.4632*X7 + 584.4209)				

Source: The table is prepared by the researcher, based on the outputs of EViews.10

7.3.4 Estimated parameters test (long-term)

This test shows the estimation of the parameters in the long-term in order to reveal the degree of influence of the independent variable on the dependent variable, as well as to determine the type of long-term relationship, as depicted in table 10.

We note through Table 10 the results of estimating the parameters of the independent variable in the long term, as the table shows that there is an inverse (negative) relationship with statistical significance between the dependent variable (Y), and the independent variables (X1, X5, X7, X8, X9), and there is a direct (positive) statistically significant relationship between the dependent variable (Y) and the independent variables (X2, X3, X4, X6).

8. CONCLUSIONS AND SUGGESTIONS

The study resulted in a number of findings. The most significant are listed below:

1. The first period for noise trading demonstrated the presence of a long-term equilibrium between noise indicators and recorded price indicators.
2. In the Iraqi Stock Exchange the noise indicators grew clearer in the second period than in the first, supporting the statements made in the literature review regarding the requirement of separating the study periods into two periods to demonstrate the effect more clearly.
3. Despite their length, the correction operations of noise trading were very similar to the corrective procedures taken by rational market investors.
4. Regardless of the indicator's signal, the number of traded shares and the turnover rate of Iraqi Stock Exchange were among the most significant and influential noise indicators.

8.1 Suggestions

On the basis of prior findings, the following recommendations can be formulated:

1. It is vital to monitor all performance and trade indications of the Iraqi Stock Exchange as a whole and not to rely solely on a few indicators for brief durations.
2. Some market reports may be misleading in terms of their absolute and relative figures if the time and historical series of these indicators are not considered.
3. It is feasible to rely on tracking noise indicators or noise traders that offer more precise outcomes than absolute or relative statistics.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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Peer-review history:
The peer review history for this paper can be accessed here:
https://www.sdiarticle5.com/review-history/90142