STUDY OF FACTORS AFFECTING THE LIQUIDITY OF FUTURES CONTRACTS, REGARDING ORDER-BASED CRITERIA

[1]Elnaz Basirian, [2]Mohammad Hadi Sehatpour
[1]Department of Finance, Faculty of Accounting and Management,
Shahid Beheshti University,
Tehran, IranE_basirian@yahoo.com
[2]Department of Industrial Management, Faculty of Management,
Tehran University, Iranmh.sehat@ut.ac.ir

Abstract

In a liquid market, trades could take place quickly and at a fair price. Considering the importance of liquidity as one of the main indexes of financial markets efficiency, recognizing the factors affecting this phenomenon is a great matter of importance.In this regard, the present study aimed to examine factors affecting the liquidity in Iran's gold futures market using the data of gold coin future contracts from 2017 to 2018. Being more precise in liquidity measurement due to the concentration on the current market situation, as well as, having a better performance than trading-based criteria in such applications, two order-based criteria of "bid and ask spread" and "the depth of market" were taken into account.Considering the related literature, the most important factors on liquidity such as trade volume, volatility, and price level were identified to investigate their impacts on the liquidity criteria. Subsequently, employing the multivariate linear regression led to the conclusion thatthere is a significant and direct relationship between the volatility of futures contract prices and the depth of market in future contracts on gold coin in Iran Mercantile Exchange (IME) while, the relation between the other factors with the aforementioned criteria are negligible.

Keywords: liquidity,Future contracts, Bid and ask spread, Depth of market.

1. Introduction

Liquidity is often described as the ability totransactat a reasonable cost across a widevariety of market conditions.Market participants often make decisions about when and where to tradebased onanticipated liquidity levels. Financial markets are formed to create and improve liquidity for securities such as stocks and bonds, and commoditiesthat include precious metals or agricultural products. Various mechanisms are used in these markets to improve and facilitate transactionssuch that if liquidity in themarket is high, investors can trade easily and fairly[1]. In addition to creating a mechanism to help determinethe fair price of the assets, one of the main functions of the secondary market is to provide the basis for the transaction, to create the proper liquidity.

As liquidity is a difficult concept to define and thereforemeasure, many criteria have been introduced to measure liquidity, each having its advantages and disadvantages.In a categorization by Aitken and Comerton-Forde [2], liquidity measures are divided into two categories, order-based and trade-based criteria. Trade-based criteria, are lagging and therefore do not necessarily reflect the ability of quick and relevant trading.In addition, the emergence of electronic trading systems has led to more and detailed data collection and, consequently,the raising of new liquidity criteria concerning market order[3]. These criteria deal more closely with the ability of quick trading and related costs. Recently, order-based criteria such as the bid and ask spread and depth of market are cited frequently as effective metrics of liquidity [4][3, 5]. Considering the importance of liquidity, it is tried to focus on affecting factors inthe market of future gold coin contractsin the IME.

In general, a futures contract is a standardized, exchange-traded derivative contract to buy or sell a specified asset on a future date for a price agreed today [6, 7]. In Iran,futures contracts on gold coins were inaugurated in 2008 in IME. A brief look at the relevant statistics in the domestic futures market indicates that the volume and value of these transactions have drastically increased over time. Such growth trend was due to factors including promotion of technology and knowledge infrastructures, changes in macroeconomic policies, and moving toward the realization of the exchange rate (in contrast with the controlling approaches). Moreover, the International gold market's fluctuations have affected the mentioned growth in the local gold market.

Following the exchange rate growth and the entry of speculators into the futures market, conjectures about sending signals to the spot market and overshadowing the exchange rate also intensified. Consequently, the IME decided to stop the futures contracts on the gold coin in 2018. Therefore, in this study, we aim to assess the most important

factors that intensify the cash flow in the mentioned market in view of the investigation of liquidity by extending the findings provided by Fartokzade et al [3]and comparing the results using the latest available data.

The data of futures contracts for gold coins in IMEfrom 2017 to August 2018 were investigated and the effect of market activity level, risk, and information asymmetry on these variables is revised using regression tests based on consolidated data .The originality of the current study isthe precise consideration of liquidity measuring criteria. In fact, due to the focus of the aforementioned criteria on the current market situation and their substantial performance in comparison to the trade-based metrics, the order-based criteria were taken into account.

The rest of the paper is structured as follows:Section 2reviews the related research works while Section 3 presents a comprehensive description of the methodology and the details of the model employed in this study. In Section 4, the results of the regression model and the considered hypnotizes are presented. Finally, Section 5 presents concluding remarks and recommendations for future works following the findings of this research. Statistics on the future market of the gold coin in the IME are provided in appendix A.Figure(*1*shows the outline of the research framework.
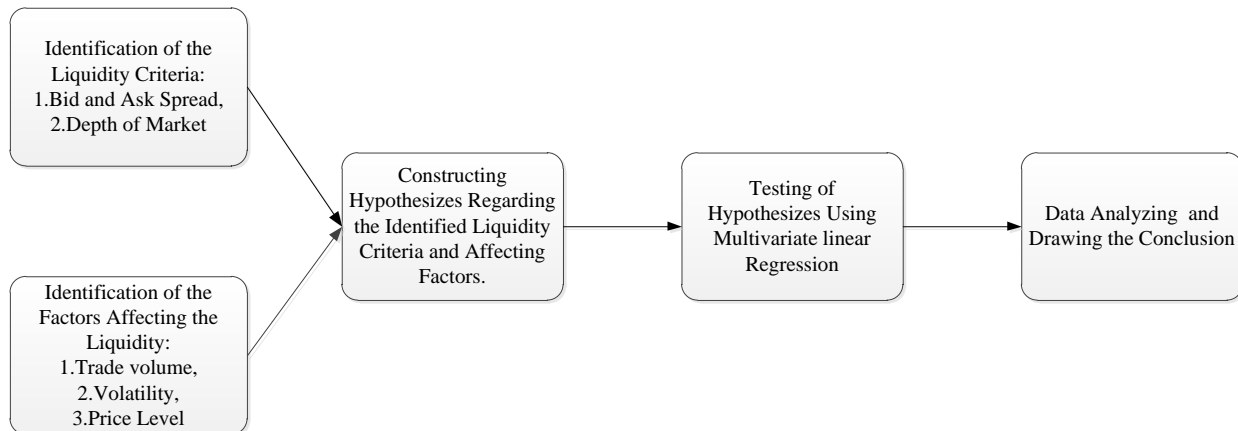
Figure(1). Research framework

2.Literaturereview

Many studies have been conducted on the liquidity of different markets. In a recent study, it was tried toidentify the most important liquidity measures and their behavior during the trading session. By employing the intraday data of 7 stocks of the Tehran Stock Exchange to calculate 27 liquidity measures it was concluded that relative spread with mid quoted prices can be mentioned as the most practical microstructure component affecting liquidity[8]. In another research, elimination of the ambiguities related to market liquiditywas targeted through precisely measuring it using popular and proven liquidity measures such as depth, breadth, tightness, and immediacy. 500 stocks constituting the NIFTY 500 index of the National Stock Exchange, India, as of 26th May 2019were taken into account. Crucial interdependencies between liquidity dimensions were also investigated [9].

Yang et al. developed a model for determining the optimal bid-ask spread strategy by a high-frequency trader (HFT) who has an informational advantage and receives information about the true value of a security. They hired an information cost function considering volatility and the volume of the asset. The results showed that more LFTs and a higher exchange latency both hurt market liquidity. Besides,their model generated some testable implications with supporting empirical evidence from the NASDAQ-OMX Nordic Market[10].

Moreover, using the time series and machine learning techniques and Dow Jones Industrial Average (DJI) index, Saleemi showedthe effects of the pandemic on relationship dynamics between liquidity cost and stockmarket returns. His findings suggested that the liquidity cost must be priced in returnsdue to the pandemic-related uncertainty[11]. Using 11 years of comprehensive New York Stock Exchange limit order book dataCenesizoglu and Grassstraightened out bid- and ask-side liquidity to document several empirical facts to improve the understanding of the determinants, commonality, and pricing of liquidity. The results revealed that first, the ask- but not bid-side liquidity of financial stocks get worse during the 2008 short-selling ban. Second, ask- (bid-) side liquidity rises (falls) in lagged short- and long-term returns. Third, liquidity commonality increases during the financial crisis, more so on the bid- than on the ask-side. Finally, ask- but not bid-side illiquidity forecasts daily returns, while both predict monthly returns[12].

In another study,Li and Xia[13] examined "the impact of stock liquidity on bankruptcy risk". The results proved that companies with more liquid stocks would have less intrinsic risk. In their words, stock liquidity reduces the intrinsic

risk of the company by increasing the price information efficiency and facilitating corporate governance by major shareholders.

Gold et al. studied liquidity and volatility commonality in the Canadian stock market. The findings of this study extended the results of previous studies inliquidity commonality and indicated that even after controlling individual determinants of liquidity such as price, volume, and volatility, liquidity commonality remains. Moreover, they investigated the causal relationship between liquidity and volatility which presented that depth, proportional effective spread, and liquidity changes predict volatility changes for bid-ask spread, depth, and proportional effective spread.

[14]

Perusing a better understanding of trends in liquidity within U.S. derivatives markets,Fett and Haynes[15] made use of trade and order book audit trail data for three active futures products including S&P E-mini, Ten Year Treasuries, and WTI Crude Oil from 2013 through mid-2016. Multiple liquidity measures for each of these products, such as bid-ask spreads, order book depth, and other metrics related to trading costs and execution quality were calculated. The balance of the overall findings of this study indicated that costs for market participants, and the prevalence and concentration of market-makers, did not change significantly over the considered period. Furthermore, this research work highlighted a set of measures that can be utilized on an ongoing basis for futures liquidity monitoring.Lischewski and Voronkova [16] examined "whether the stock liquidity along with the size and value of the company is one of the major factors influencing the stock rate of return or not." The results of their study for the period of 1996-2009, on 2000 stocks, indicated that, despite conventional expectations, the liquidity of the stock does not have a significant effect on the stock rate of return in comparison to stock value and the size of the company. Cao and Wei[17] established convincing evidence of commonality for various liquidity measures based on the bid-ask spread, volumes, and price impact.In this research, smaller firms and firms with higher volatility exhibited stronger commonalities in option liquidity. Other findings of the study revealed that information asymmetry plays a much more dominant role than inventory risk as a fundamental driving force of liquidity. Moreover, the market-wide option liquidity is closely linked to the underlying stock market's movements. Additionally, the options liquidity responded asymmetrically to upward and downward market movements, with calls reacting more in up markets and puts reacting more in down markets.

Using new and widely employed measures in the literature,Goyenko et al.[18] compared annual and monthly estimates of each measure against liquidity benchmarks such as effective spread realized spread and price impact.By examining changes in these order- and trade-based measurement proxies before and after the commencement of the economic crisis on the Jakarta Stock Exchange,Aitken and Comerton-FordeAitken and Comerton-Forde [2] provided evidence that order-based measures of liquidity provide a better proxy for liquidity. They also employed a new measure of liquidity, which captures the bid-ask spread, the order depth, and the probability of order execution. Their study provided evidence of the value of this type of measure in assessing the impact of changes made to market structure.

3. Methodology

To investigate the characteristics of liquidity, knowing the factors affecting this parameter would be necessary. For this purpose, after reviewing the literature, the most important factors influencing liquidity were identified, and the effects of these factors on two criteria "bid and ask spread" and "market depth" were tested in the form of six hypotheses.In definitions, the price of securities bought by the market maker, the bid, and the price at which the securities are offered to sell, is called the ask. The difference between these two prices will be bid and ask spread. Similarly, in financial sciences, a deep market is a financial market, whereby a buy or sale order is executed with a minimal waiting time. In another definition, if the market is deep, a large volume of the trading order is required to change the security's price[12].Table Table1 provides a series of studies focusing on the identification of intended factors.

Table1-Conducted studiesemployingregardedfactors.

Factors	Conducted study
Trade volume	[19], [20], [21],[22], [23], [24], [17],[4], [3],
Volatility	[17], [24],[25], [14], [4], [3]
Price levels	[15, 17],[19],[4],[3]

The hypotheses were considered as follows:

Hypothesis 1: The volume of futures contracts trading is effective on the bid and asks spread

Hypothesis 2: The volatility of futures contract prices is effective on the bid and asks spread

Hypothesis 3: The level of future contract pricesis effective onthe bid and asks spread

Hypothesis 4: The volume of futures contracts trading is effective on the depth of the market.

Hypothesis 5: The volatility of futures contract prices is effective on the depth of the market.

Hypothesis 6: The level of future contract pricesis effective on the depth of the market.

3.1. Data, statistical population, statistical sample, and data gathering tool

The data of futures contracts on gold coins in IMEfrom 2017 to August 2018 were investigated. Collection of the necessary information in the field of research was carried out through the study of books and scientific and academic journals, and the data needed for statistical analysis were gathered by referring to IME. The link related to the statistics on the future market of the gold coin in IME is provided in appendix A.

3.2. Model and research variables

To test the first, second, and third hypotheses of the research, the following (Equation(1)) model was used:

$$BAS_{t,d} = \beta_0 + \beta_1 TV_{t,d} + \beta_2 GK_{t,d} + \beta_3 PRDUM_{t,d} + \varepsilon_{t,d} \tag{1}$$

Where terms imply the following definitions:

$BAS_{t,d}$ = the bid and ask spread at each period of t and day d which is equal to the difference between the price to be paid for immediate buy on the market and the price to be received for immediate sale;

$TV_{t,d}$ = volume of transactions in each t period and day d which is equal to the number of transactions;

$GK_{t,d}$ = The price volatility obtained using the Garman-Colson (1980) formula for each t period and day d are calculated as follows (Equation(2))[26]:

$$GK = 0.511(a+b)^2 - 0.019\left[x\ (a-b)\ + 2ab\right] - 0.383\ x^2 \tag{2}$$

So that:

a = Natural logarithmic difference of the highest price and the lowest opening price of transactions;

b = Negative logarithmic difference of the lowest price and opening price of transactions;

x = Natural logarithmic difference of the close and open prices of transactions.

$PRODUM_{t,d}$ = Average of future contracts' prices of each tperiod.

To test the fourth, fifth, and sixth hypotheses of the research, the following model was used (Equation(3)):

$$Depth_{t,d} = \beta_0 + \beta_1 TV_{t,d} + \beta_2 GK_{t,d} + \beta_3 PRDUM_{t,d} + \varepsilon_{t,d} \tag{3}$$

Where terms imply the following definitions:
Dependent variable:

$Depth_{t,d}$: market depth at each time t period and day d which is equal to the number of tradable contracts at the bestprices.

Independent variables were defined in the description of (Equation(1)).

3.3. Descriptive and inferential statistics

The descriptive statistic indexes used in this research are mean, median, standard deviation, maximum and minimum. Moreover, a multivariate linear regression model wasused to test the hypotheses. Afterward, tests for the significance of the whole model and independent variables were explained. Finally, the classical regression assumptions were described. It is to be noted that Eviews 9 software was used to analyze data in this study.

3.3.1. Testing the significance of the model

F statistics is used to determine the significance of the regression model. The null hypothesis in the F test is as follows (Equation(4)):

$$\begin{cases} H_0 : \beta_1 = \beta_2 = ... = \beta_k = 0 \\ H_1 : \beta_1 \neq \beta_2 \neq .... \neq \beta_k \neq 0 \end{cases} \tag{4}$$

which its accuracy is investigated by the following statistics (Equation(5)):

$$F = \frac{ESS / (K-1)}{RSS / (N-k)} \tag{5}$$

To decide on accepting or rejecting the null hypothesis (H_0), the obtained F statistic is compared to the F in the related table, which has been calculated with the K-1 and N-K degrees of freedom at the error level of α=5%, if the

calculated F is greater than F in the Table ($F > F_{\alpha(K-1,N-K)}$), the numerical value of the test function is located in the critical region and the null hypothesis is rejected. In this case, with a 95% confidence level, the whole model will be significant. If the calculated F value is less than F in the Table, H_0 is accepted and the significance of the model is not confirmed at the 95% confidence level.

3.3.2. Testing the significance of research variable

To analyze the independent variable coefficient in each model, the t statistic has been used (Equation(6)).

$$\begin{cases} H_0 : \beta_1 = 0 \\ H_1 : \beta_1 \neq 0 \end{cases} \tag{6}$$

Which its accuracy is investigated by the following statistics(Equation(7)):

$$T = \frac{\hat{\beta}_1 - \beta_1}{SE(\hat{\beta}_1)} \sim t_{\frac{\alpha}{2}, N-k} \tag{7}$$

F is used to decide on the acceptance or rejection of the null hypothesis, the T statistic obtained is compared to the table which is calculated by N-K degree freedom at 95% confidence level.

If the value of calculated T is larger than the table t ($|T| > t_{\frac{\alpha}{2}, N-k}$), the numerical value of the test function is placed in the critical region and the null hypothesis(H_0) is rejected.

In this case, with a confidence coefficient of 95%, the intended coefficient (β_1) will be significant, which implies the relationship between the independent and the dependent variable.

Before analyzing the research data, the reliability of the variables should be checked which examines whetherthe mean, variance, and covariance of the variables have been constant over time in the intended period.Using reliable variables in the model would notresult in false regression. In this regard, such tests as Levine, Lynn, and Cho, I'm test, Shin and Dickey Fuller's can be employed.

4. Results and discussion

The mean, median (central criteria), standard deviation, maximum, and minimum (dispersion criteria) of the used variables were calculated and are presented in Table 2.

Table 2-Descriptive values of studied variables

Research variables	Mean	Median	Max.	Min.	SD
Bid and ask spread	3.32×10^{-6}	0.000	0.0006	-0.0005	7.72×10^{-5}
Trade volume	6.077	5.921	9.654	1.098	1.560
Price volatility	0.018	0.016	0.039	0.010	0.006
Future contract's price	22.730	22.527	25.969	19.365	1.330
Market depth	7.636	7.559	9.227	4.574	0.759

As indicated in Table 2, the average and the median values of the bid and ask spread were 3.32×10^{-6} and 0.000, respectively andas one of the most important dispersion criteria, the amount of standard deviation was 7.72×10^{-5} for bid and ask spread. Moreover, the maximum and minimum values of bid and ask spread were 0.0006 and -0.0005, in that order. It is worth mentioning that, in the case of the trading volume variable, the values of mean and median of the above variables were 6.077 and 5.921 respectively. Also, the highest amount of trading volume variables was equal to 9.654 and the lowest value is1.098 and the standard deviation wasequal to 1.560. Details of other variables including depth of market and price volatility are given in Table 2.

4.1. Correlation test of variables

In the first step, Pearson correlation analysis of the research variables wasdiscussed and the results are presented inTable 3.

Table 3-Pearson correlation analysis

Variable	Bid and ask spread	Trade volume	Price volatility	Future contract's price	Market depth
Bid and ask spread	1	-0.029 0.431	-0.013 0.726	-0.032 0.394	- 0.037 0.32
Trade volume	-	1	0.500 0.000	0.597 0.000	0.546 0.000
Price volatility	-	-	1	0.544 0.000	0.497 0.000
Future contract's price	-	-	-	1	0.554 0.000
Market depth	-	-	-	-	1

As indicated in Table 3, in Pearson correlation, there wasno significant correlation between independent research variables and "bid and ask spread" (significant level was higher than 0.050). However, trading volume variables, price volatility, and futures contract prices have had a direct and significant correlation with market depth (significance was less than 0.050 and positive statistics). Moreover,as it is obvious in Table 2, there was no significant correlation between independent and control variables (correlation statistic was less than ± 0.800).

4.2. Normal test of dependent variables

The Jarck-Bra test was used to checkthe normality of dependent variables andthe results are presented in Table 4-Jarck-bra test. Based on this test's results, since the significance level was less than 0.05, the distribution of dependent variables was not normal. When the size of the sample is large enough, the deviation from the normal assumption is usually trivial and its consequencesare negligible.According to the central limit theorem, it can be observed that, even in the absence of normality, the test statistics will asymptotically follow the appropriate distributions. Therefore, the lack of justification for this hypothesis is negligible [27]. On the other hand, making all classical assumptions in real-world conditions would not be achievable, and failing to make some of them, does not completely undermine the results of the estimated model (especially in large samples).Meanwhile, when the sample size is large enough and other classical assumptions are made, the deviation from normality is usually trivial and its consequences are negligible [28].

Table 4-Jarck-bra test

Variable	Jarck-bra statistic	Level of significance
Bid and ask spread	233.640	0.000
Market depth	9.800	0.007

4.3.Reliability (static) test of the variables

In order to test the reliability of the variables, the Im, Pesaran, and Shin (IPM) test were used. Asindicated in Table 5, the significance levels for all variables were less than 0.050 which presents that all variables are stable.

Table 5-Reliability test of the variables

Research variables	t statistic	Level of significance
Bid and ask spread	-30.248	0.000
Trade volume	-4.578	0.000
Price volatility	-5.820	0.000
Future contract's price	-8.492	0.000
Market depth	-4.640	0.000

It should be noted that the data and variables used in this study do not have the characteristics of the combined (panel) data. In this regard, the models are classified into three groups in terms of the use of statistical information. Some models are estimated by using "time-series data" or, in other words, the data areprovided over a period of a few years. Some other models areestimated based on "cross section data" in which, variables are evaluated in a given period of time, such as a week, a month or a year in different units. It means variables are measured in a given period of time, such as a week, a month, or a year in different units.

The third estimation model is based on "panel data". In this method, a series of cross-sectional units (for example, corporations) are considered over the years.The present research falls into the time series researches category since it examines the relationships of a series of distinct variables (relating to a unit) over several periods.

4.4. Test of research hypotheses

4.4.1. Testing the first, second, and third hypotheses

The test results of the first to third hypotheses of the research were obtained by using the combined data model and ordinary least squares method and presented in Table 6-Testing the first, second, and third hypotheses

Table 6-Testing the first, second, and third hypotheses

Variable	Coefficients	Standard error	t statistic	Level of Significance
Constant value	0.0008	0.0006	1.295	0.195
Trade volume	3.93×10^{-5}	3.19×10^{-5}	1.231	0.218
Price volatility	0.0006	0.0007	0.983	0.325
Future contract's price	-4.94×10^{-5}	3.86×10^{-5}	-1.278	0.201
Self-return of stage (1)	-0.131	0.037	-3.507	0.000
F statistic	3.642	Coefficient of determination		0.120
Significance level of F statistic	0.003	Adjusted coefficient of determination		0.114
Arch test level of significance	0.614	Durbin-Watson value		1.995
Significance level of the test through Godfrey method	0.961	Significance level of Jarck-bra test		0.000

• **Hypothesis 1**: The volume of futures contracts trading is effective on the bid and asks spread.
Regarding the results of Table 6-Testing the first, second, and third hypotheses, since the trade volume t statistic was smaller than ±1. 965 and the significance level was greater than 0.05, there was no significant relationship between the trade volume of future contracts and bid and ask spread. In this way, the first hypothesis of the research was not confirmed.

• **Hypothesis 2**: The volatility of futures contract prices is effective on the bid and asks spread. Regarding the results of Table 6-Testing the first, second, and third hypotheses, since the price volatility t statistic was less than ±1. 965 and the significance level was greater than 0.05, there was no significant relationship between the volatility of futures contract prices and the bid and ask spread. Consequently, the second hypothesis of the research was not confirmed.

• **Hypothesis 3**: The level of future contract prices is effective bid and asks spread. Regarding the results of Table 6-Testing the first, second, and third hypotheses, since the price level of futures contracts t statistic was smaller than ±1. 996 and the significance level was greater than 0.05, there is no significant relationship between the price level of future contracts and bid and ask spread. In this way, the third hypothesis of the research was not confirmed.

The low level of variables indicates their weakness in explaining variable changes and eventually expresses independence of the dependent variable variations from the changes of independent variables. Knowing that the selected variables in the above model were all based on the literature and relevant theoretical foundations, the subject of low impact stems from the nascent and weakness of the market. As can be seen, the Durbin-Watson statistic was 1.995, which was between 1.5 and 2.5. Meanwhile, the significance level of the F statistic was also 0.006, which was below 0.05 and indicated the significance of the model. Another noteworthy point in Table 6-Testing the first, second, and third hypotheses is the modified coefficient of the model.The amount of adjusted coefficient of the employed model was about 11%, which showed that about 11% of variations of the dependent variable could be explained through the independent and control variables, which was an acceptable value. Moreover, the significance level of the Arch test was higher than 0.05, which presents that there was no inconsistency of variance heterogeneity in the estimated model. The significance level of Godfrey's test was higher than 0.05, which implies that there is no serial correlation problem in the model. On the other hand, the significance level of the Jarck-bra test was less than 0.05 indicatedthat the distribution of errorsentences of the model wasnot normal.In this regard, it is notable that the attainment of all classical assumptions in real terms is not very achievable, and failure to establish some of them does not completely undermine the results of the estimated model which was discussed in section 4.2[28].

4.4.2. Test of the fourth, fifth, and sixth hypotheses
The test results of the fourth to sixth hypotheses of the research were obtained by using the panel data model and ordinary least squares method and presented in Table 7-Testing of the fourth, fifth and sixth hypotheses
Table 7-Testing of the fourth, fifth and sixth hypotheses

Variable	Coefficients	Standard error	t statistic	Level of Significance
Constant value	5.326	1.504	3.539	0.000
Trade volume	-0.065	0.066	-0.992	0.321
Price volatility	22.848	5.702	4.006	0.000
Future contract's price	0.093	0.083	1.12	0.263
Self-return of stage (1)	0.973	0.01	91.898	0.000
F statistic	2542.428	Coefficient of determination		0.935
Significance level of F statistic	0.000	Adjusted coefficient of determination		0.935
Arch test level of significance	0.597	Durbin-Watson value		2.044
Significance level of the test through Godfrey method	0.064	Significance level of Jarck-bra test		0.000

•**Hypothesis 4**: The volume of futures contracts trading is effective on the depth of the market.
Regarding the results of Table 7-Testing of the fourth, fifth and sixth hypothesessince the t statistic of the trade volume was smaller than ±1.965 and the significance level was greater than 0.05, there was no meaningful relationship between the trade volume of future contracts and the depth of the market. In this way, the fourth hypothesis of the research was not confirmed.
•**Hypothesis 5**: The volatility of futures contract prices is effective on the depth of the market.
Regarding the results of Table 7-Testing of the fourth, fifth and sixth hypotheses, since the t-statistic of price volatility was greater than + 1.965 and its significance level was less than 0.05, there is a meaningful and direct correlation between the volatility of futures prices and the depth of the market. In this way, the fifth hypothesis of the research is confirmed.
• **Hypothesis 6**: Thelevel of future contract prices is effective on the depth of the market.
Regarding the results of Table 7-Testing of the fourth, fifth and sixth hypotheses, since the t statistic of the futures contract price level was smaller than ±1.965 and its significance level was greater than 0.05, there is no significant relationship between the prices level of future contracts and the depth of the market. In this way, the sixth hypothesis of the research was not confirmed.
As it is noted, the low significance level of variables and their weakness in explaining the changes of the dependent variables were due to the nascent and weakness of the market.Since the Durbin-Watson statistic was between 1.500 and 2.500 (2.044) and the significance level of the F statistic was 0.000, which wasbelow 0.05, the significance of the model was indicated. The modified coefficient of the modelisanother notable point in Table 7. The value of the adjusted determination coefficient of the model was about 93%, which presented that about 93% of the variations of the dependent variable could be described through the independent and control variables, which wereacceptable values. In addition, there was also no inconsistency of variance in the estimated model since the significance level of the Arch test was higher than 0.050. Being higher than 0.050, the significance level of Godfrey test indicated that there was no serial correlation problem in the model.
On the other hand, error sentences of the modelfaced a lack of distribution normality as the significance level of the Jarck-bra test was less than 0.050. As notedearlier, the deviation from classical assumptions, normality, and its consequences are negligible in large samples [28].
As shown in the results, the exact execution of statistical tests for the first hypothesis of the study indicated that the volume of futures contracts isnot effective on the bid and ask spread, which contradicts the results of the studies ofMcInish and Wood [19] andDing[20]. In these studies, they considered the negative effect of trade volumes on the bid and ask spread in the trader-based markets as a result of economies ofscalein trading. This means that increasing the volume of the United States Dollar (USD) transactions will encourage traders to reduce the price gap to cover their costs. So, this is in contrast with previous studies, and it should be noted that the new market of future contracts in Iran may not perform as well as international futures markets. The test result of the second hypothesis was also in conflict with the result ofOverturf[29]study. In the related literature, in trader based markets, there is a positive and negative relationship between the price gap and the price level, but, there was no effect on the Iranian future market, which is an order-basedmarket and there is no market maker to place orders on both sides of the market. Similar to

the first hypothesis, it is notable that the difference in results could be due to the novelty, Low market record, legal and technological constraints[3].

The third hypothesis test result can be compared with [19]results which showed a contrast with this study. In the same way, this contradiction currently could be because of the Iranian futures market immaturity.

According to the results of the fourth hypothesis, this study can be considered contradictory to the results of Bessembinder and Seguin [22] and Chordia and Roll [21]. In the previous literature, the effect was positively evaluated that was due to the reduction in the cost of liquidity in the market and as a result of the tendency to carry out transactions at existing prices, where this contradiction is the result of the incompatibilityof literature and western arguments at the level of the trade market of future contracts in Iranat the current time. The result of testing the fifth hypothesis of the present study was not consistent with the results of the study of Fartokzade et al. [3]. The result of the sixth hypothesis of the present study showed that the price level of future contracts does not affect the depth of the market, and this can be in conflict with the study ofFartokzade et al. [3]and the explanations presented in the first to fourth hypotheses of the research would be valid.

Another reason for the conflict between the results of the current study and other researches findings can be seen in the nature of the underlying assets of considered contracts. Most of the previous studies have been done focusing on future contracts on the essential commodities as the underlying asset. Traders' behavior and motivation vary greatly in the futures market of gold coins, which mostly stems from speculative and precautionary demands. On the other hand, such reasons as high risk and cost of preserving precious assets, high volatility of the market, and trading leverage have brought considerable popularity to the futures market. Playing a sensitive role in the pricing mechanism of futures contracts, the exchange rate has a direct effect on the inflationary expectations and the price of gold coins (in the spot market) as the underlying asset while changes in the global gold price, solely affect the price of the domestic gold market. As a result, the seasonal and systematic volatility in the foreign exchange rate, along with global volatility of the gold market, provide attractive opportunities for speculators which leads to boost cash flow into the market. Subsequently,this trend increases the liquidity of the market that complies with the results of the current study. Therefore, based on the nature of the underlying asset and traders' tendency in the domestic market, the conflict between the findings of different researches could be addressed.

5. Conclusion

Liquidity is one of the most important metrics for all assets, particularly commodities which ensures market participants the ability to buy and sell continuously. The characteristics that attract speculators and investors to a market [30]. In this study, the most important factors influencing liquidity and the effect of these factors on two order-based criteria "bid and ask spread and market depth" was tested in the form of six hypotheses. Models were estimated using "time-series data" meaning that the data were provided over a period of a few years. Pearson correlation analysis was used to test the correlation of variables and the Jarck-Bra was used to check the normality of dependent variables. The test results of the hypotheses of the research were obtained by using the combined data model and ordinary least squares method that showed there were no significant relationship between the trade volumes of future contracts, volatility, the price level of future contracts, and bid and ask spread. In this way, the first three hypothesizes of the research were not confirmed. There was also no meaningful relationship between the trade volume and price levels of future contracts and the depth of the market. So the fourth and sixth hypotheses of the research were not confirmed. The fifth hypothesis "The volatility of futures contract prices is effective on the depth of market" was confirmed.Based on the nature of the underlying asset and traders' tendency in the domestic market, the seasonal and systematic volatility in the foreign exchange rate, along with fluctuations of the global gold market,attractive opportunities for speculatorsare provided which leads to increase cash flow into the gold coin futurecontracts transactions and subsequently supports the liquidity of the market.

List of Symbols

Nomenclatures	
a	Natural logarithmic difference of the highest price and the opening price of transactions
b	Negative logarithmic difference of the lowest price and opening price of transactions
d	Day which transactions had took place
F	F statistic
H_0	Null hypothesis

H_1	Alternative hypothesis
T	Time period
x	Natural logarithmic difference of the close and open prices of transactions.
$BAS_{t,d}$:	The bid and ask spread at each time period of t and day d
$Depth_{t,d}$:	Market depth at each time t period and day d
ESS	Explained Sum of Squares
$Gk_{t,d}$:	The price volatility obtained using the Garman-klass (1980) formula for each t period and day d
$PRDUM_{t,d}$	Average of future contracts' prices of each t period.
RSS	Residual sum of squares
SE	Standard error
$Tv_{t,d}$:	the volume of transactions in each t period and day d

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Appendix A:
The data related to this research in the relevant section of the future market is available on the Iran Mercantile Exchange website at the following address:
http://www.ime.co.ir/fut-report.html.