# The Investigation of the Effect of New Liquidity Indicators on the Predictability of Stock Returns of Companies Listed on Tehran Stock Exchange

[1]Tayebeh Najafi and [2]Mehrdad Ghanbari
[1]Department of Accounting, Ilam Branch, Islamic Azad university, Ilam, Iran
[2]Department of Accounting, Kermanshah Branch, Islamic Azad university, Kermanshah, Iran

**Abstract:** Company returns is one of the important information in economic decisions which serves as an incentive for investors. As a result it is important to identify factors affects it. The aim of present study was to evaluate the impact of new liquidity indicators on the predictability of stock returns of companies listed on the Tehran Stock Exchange. This study is applied, descriptive-survey research and the relationship between the variables is causal. In present study, panel data was used to estimate the model. The research methodology is ex post facto (through the use of past information). The hypothesis of this study was going to investigate the effect of a comprehensive index of liquidity, net cash balances, compliance procedures of current debt and receivables maturities  cash conversion cycle, Lambda method and adjusted cash conversion cycle index on predictability of stock returns of companies listed on Tehran Stock Exchange. In current research the statistical tests, correlation and multiple regression and tests t were used. The research population was consisted of companies listed on Tehran Stock Exchange (635 companies) and sample size was 125 and sampling method was removal. Statistical Software (Eviews) was used to test hypothesis. The results showed that comprehensive index of liquidity net cash balances, compliance procedures of current debt and receivables maturities, cash conversion cycle, Lambda method (to calculate liquidity) and the adjusted cash conversion cycle has a significant impact on the predictability stock return of companies listed on the stock exchange.

**Key words:** New indicators of liquidity, profitability, stock, stock exchange, predictability

## INTRODUCTION

Accounting as an informational system has some products to achieve a series of goals. The main objective of financial accounting system is to provide information useful for decision-making and perhaps this is the most logical and teleological aim that can be consider for accounting. Financial statements (basic product of accounting system) are the main tools to deliver information to users. One of the critical factors that investors focus on to make their decisions is company's stock returns.

It means that investors are looking to create a bridge between the components of financial statements and the company's stock price. The aim of present study is to help investors to better understanding and assessment of indicators by creating a bridge between new index of stock liquidity and the efficiency of companies listed on the Tehran Stock Exchange.

**Descriptive statistics of variables:** Since the data analysis usually take place by summarized statistics such as mean and standard deviation, so in order to initial study and data analysis, at first data related to the descriptive statistics of dependent and explanatory variables of current study presented in Table 1 to provide an overall schema of data analysis.

In present study, the follow factors were considered. A comprehensive index of liquidity, net cash balances, compliance procedures of current debt and receivables maturities, the cash conversion cycle, Lambda method (to calculate liquidity) and adjusted cash conversion cycle, companies that their stocks published in stock exchange and including of features: during the study period don't have any changes in the financial period. Don't including of active companies in financial activities domain such as investment companies, banks, insurance companies and financial institutions because of these institutions have different nature of activities and their main income is through investments and aren't dependent on other companies activities, so are companies with different nature and finally removed. The needed data for research var iables must be available during 2010-2014. In order to enhance the comparability, the financial period ended at March. During the research period, didn't have trading interruption greater than 3 month. Initial data during 2010-2014 formed the data research and data were extracted of Tadbir Pardaz S, annual financial statements

**Corresponding Author:** Tayebeh Najafi, Department of Accounting, Ilam Branch, Islamic Azad University, Ilam, Iran

Table 1: Descriptive statistics of variables

| Variable/features | Predictability of stock returns | Index of conversion cycle adjusted current cash | Lambda method | Cash conversion cycle | Compliance procedures of current debt and receivable maturities | Net cash balances | Comprehensive index of liquidity |
|---|---|---|---|---|---|---|---|
| Average | 3.05 | 0.5147 | -0.18452 | 0.01632 | -0.0218 | 0.9124 | -4.9852 |
| SD | 27.3 | 0.3614 | 2.53290 | 0.03102 | 0.036 | 0.1842 | 5.2632 |

Table 2: Results of stability tests and unit root variables

| H₀ | Test | Level | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Ret | CLI | NLB | MM | CCC | Lamba | OC |
| Unit root | Levin Lin and Chu | -11.475 | -18.84 | -25.55 | -24.25 | -24.86 | -19.19 | -62.7445 |
| | | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) |
| | Pesaran, Shin | -5.320 | -3.03 | -3.69 | -7.26 | -9.91 | -3.32 | -11.3300 |
| | | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) |

Ret: The predictability of stock returns, CPI; A Comprehensive Index of liquidity, NLB; Net cash balances, MM; Compliance procedures of current debt and receivables maturities, CCC; The Cash Conversion Cycle, Lambda; Lambda method (to calculate liquidity), OC; Cash conversion cycle indicator

and websites of the stock exchange. Eviews Software was used to data analysis. Table 1 summarizes the descriptive statistics of observations. The standard deviation indicates the degree of dispersion around the mean numbers. The distribution of this amount is greater than the average even higher numbers. It means that the group is heterogeneous in terms of features measured and in contrary smaller standard deviation indicates a more homogeneous group in terms of features measured (Maryam, 2004).

**The reliability of variables**
**Reliability testing, importance and reasons:** Employing traditional methods of econometric to estimate the model coefficients using time series data is based on the assumption that the model variables are stable. Time series variable are stable when the mean, variance and correlation coefficients remain constant during time. Reliability or unreliability has a virtual impact on behaviors and characteristics of variable. If the time series variables used in the estimation of regression coefficients be unstable while maybe there are no conceptual relationship between the model variables and the determination coefficient obtained ($R^2$) may be vague too and finally lead to incorrect interpretation about the relationship between the variables by researcher. ($R^2$) is large because when a time series like $y_t$ is on process, the total dispersion of regression calculated $\Sigma(Y_t-y^2)^2$ are around a constant mean Y which incorrectly assumed stable over time.

This weight to the observation that distances from Y average. As a result total amount of dispersion will be large. Since the determination coefficient $R^2$ defined as $1-(\Sigma e^2/\Sigma(y_t-y)^2)$ where ($e_t$) is the regression error terms, when $\Sigma(y_t-y)^2$ grows, terms in brackets be small and the finally upper $R^2$ obtain. Unstable variable in the model

lead to common F and t-tests doesn't have enough validity. In such situation, critical quantities provided by F and t-distributions aren't appropriate quantities for testing. Critical quantities resulted of t and f distributions are in such a way that by increasing the sample size, the possibility of hypothesis rejection ($2_0$) will be more. False rejecting of hypothesis ($H_0$) suggests that there are strong relationship between model variables while the reality is another thing and regression obtained is a spurious regression. The typical features of a spurious regression are high determination coefficient $R^2$ (near to one) and low Durbin-Watson statistic (DW) (near to zero). Unit root test is one of the tests that use to determine the reliability and un reliability of a variable which described in the next study.

**The reliability unit root test:** In common econometric methods any estimate is demand to ensure the reliability of variables (Bidram, 2001). Based on definitions, a time series is reliable when the mean, variance and covariance remain constant over time. In general when we change time origin, for example t to t+m and mean ,variance and covariance have any change, so series are steady and otherwise will be unsteady (Bidram, 2001).

The important element in use of econometric methods is looking ways to ensure that there is any false regression. There are different methods to examine correctness of regression. Mainly non-stationary of variables or randomness of variables time series leads to false regression estimated. When the data panel method is used (Levin, Lin and chu, Beritung, Peraran and Shin, Fisher's test based on Phillips-Perron and Dickey-Fuller and Hadri) tests can be used to evaluate the reliability of variables. In present study, the Levin, Lin and Chu (LLC) and Peraran and Shin tests were used that results shown in Table 2.

Table 3: Results of stability tests and unit root variables

| Variable | Coefficient | SE | t-statistic | Prob. |
|---|---|---|---|---|
| RESID01(-1) | 0.338535 | 0.106765 | 4.24581 | 0.0003 |

$R^2$ = 0.2564781; Mean dependent var = 1/678865; Adjusted $R^2$ = 0.2501248; SD dependent var = 24/22959; SE. of regression = 22.82551; Akaike info criterio = 9/106537; Sum squared resid = 39596.30; Schwarz criterion = 9/136976; Log likelihood = -349.6017; Hannan-quinn criter = 9/118712; Durbin-watson stat = 2.32546

Table 4: Correlation test (linearity)

| Variables | CLI | NLB | MM | CCC | Lambda | OC |
|---|---|---|---|---|---|---|
| CLI | 1 | 0.1842 | 0.3865 | 0.1439 | 0.15290 | 0.1147 |
| NLB | - | 1 | 0.2569 | 0.0280 | 0.06129 | 0.3251 |
| MM | - | - | 1 | 0.3951 | -0/0681 | 0.2210 |
| CCC | - | - | - | 1 | 0.03590 | 0.0347 |
| Lambda | - | - | - | - | 1 | 0.01149 |
| OC | - | - | - | - | - | 1 |

**Model autocorrelation test:** The absence of autocorrelation is one of the classic assumptions that must be considered in equations. In order to evaluate, the Durbin-Watson statistic were use. Based on the autocorrelation test results showed in (Table 3) and the probability of the t-statistic calculated is equal 0/003 and <0/05 and referring to DW statistic that is equal 2/32 and between 1/5-2/5 so the model hasn't auto correlation.

**The (Pearson) correlation coefficients between independent variables:** In estimation of parameters using OLS method, the implicit assumption is that the explanatory variables are not correlated with each other linearly. Linear correlation between variables is known as the co-linearity. Co-linearity problem arises when co-linearity is high (close to one) which in this case cannot to estimate coefficients of regression equation. Pearson correlation coefficient was used to examine the relationship between variables and results presented in (Table 4) (Gholamreza, 2002).

According to the results presented in Table 4, the highest correlation is between comprehensive index of liquidity and compliance procedure of current debt and receivables maturities and the lowest correlation is between Lambda method (to calculate liquidity) and compliance procedures of current debt and receivables maturities. Based on the results, the correlation between the independent variables is not to extent that can be considered as a high correlation. So, it can be overlooked and to estimate model of current study with all its variables.

**Variance heterogeneity test:** In many of studies that panel data present, the problem of unequal variants occurs due to its nature. Due to significant effect of variance heterogeneity on estimation, standard deviation and statistical inference, it is necessary to realize any existence or non-existence of variance heterogeneity.

Table 5: LR test results for the heteroskedasticity model

| Prob. | Lrch2 (112) |
|---|---|
| 0/00012 | 155/67 |

Table 5 shows the results of variance heterogeneity test in present study. In addition in present study the Likelihood Ratio test (LR) was used to test the equality of variances in panel data.

Evaluations showed that, since Prob3. calculated is >0.05 so, the null hypothesis that suggests the variance homology was rejected. And the model has variance heterogeneity. Because of heterogeneity of variance model based on the likelihood ratio test was confirmed, so, the model must be estimate as variance heterogeneity problem corrected. One of the ways to solve the problem of variance heterogeneity is estimation by Generalized Least Squares (GLS) methods so this method was used to estimate.

## MATERIALS AND METHODS

**Test of research model and hypotheses:** In this study, models that were introduced on 5 and 6 studies, discussed. As mentioned, before the assessment requires to F Limer estimates to determine the type of the regression model as panel or pulling and in case of acceptance of the panel, then Hausman test to determine the fixed or random effects of method conduct. Based on mentioned before, F Limer test estimates as the first test of panel data model.

### Estimate of research models and hypotheses
**Limer test:** The F Limer test can determine the presence of heterogeneity among studys. Null hypothesis of F statistic is based on homogeneity of studys. If the null hypothesis reject, the opposite hypothesis based on the existence of heterogeneity among studys (panel data of statistical data) will be accept. Chow's test results showed in Table 6. The results indicates rejection of null hypothesis and sectional heterogeneity. Therefore conclude that panel data model is an appropriate method to estimate model. In other words, since Prob. calculated are <0.05, so the null hypothesis rejected and the panel regression model confirmed.

After determination of the appropriate model to estimate panel is necessary to determine the appropriate method to test the hypotheses among fixed and random effects methods. To this purpose, the Hausman test was used which its results for research models presented in Table 5.

**Hausman test:** Hausman test used to determine the fixed and random effects. Null hypothesis in Hausman test

Table 6: Results of Limer test

| Effects test | Statistic | Prob. |
|---|---|---|
| Cross-section F | 04.13458 | 0/00140 |
| Cross-section $\chi^2$ | 29.59647 | 0/00035 |

Table 7: Results of Hausman test

| Test summary | $\chi^2$ statistic | $\chi^2$ df. | Prob. |
|---|---|---|---|
| Cross-section random | 0/0000345 | 6 | 0/6548 |

Table 8: Result of estimated model based on GLS method

| Variables | Coefficient | SE | t-statistic | Prob. |
|---|---|---|---|---|
| CLI | 0/624151 | 0/014823 | 6/297250 | 0/00000 |
| NLB | 0/514721 | 0/029640 | 8/635920 | 0/00000 |
| MM | 0/067490 | 0/012900 | 2/968870 | 0/00120 |
| CCC | 0/033417 | 0/008100 | 4/862304 | 0/00000 |
| Lambda | 0/167218 | 0/031397 | 2/424606 | 0/01560 |
| OC | 0/814720 | 0/019224 | 3/012470 | 0/00018 |
| C | -0/465541 | 0/463447 | -0/672604 | 0/50150 |

$R^2$, 0/74215; Prob (F-statistic), 0/000000; Adjusted $R^2$, 0/73654; Durbin-Watson stat, 1/89653; F-statistic, 19/49289

means that "there is no relationship between the violation and explanatory variables and they are independent". In other words, if the null hypothesis rejected and opposite hypothesis accepted, confirms compatibility of fixed effect method (Table 7). Based on the probability of Hausman statistics and because its amount is greater than 0/05, the null hypothesis related to random effects accepted. The results of the random effects to analysis are further validating.

**Estimation of research model and hypotheses test:** In this study, based on tests conducted and heterogeneity of variance and determination of method, model and test research hypotheses will be discussed. With regard to the existence of unequal variants for the model and GLS method as a way to fix heterogeneity of variance so, the results of estimated model showed in Table 8. Before discussing the results and hypothesis testing and since the determination coefficient of $R^2$ interpreted as a good value regression concluded that the higher determination coefficient indicates that the dependent variable explained better by the independent variable. Generally stated that the regression coefficient is a useful benchmarking to examine regression. Considering estimated coefficient in the model concluded that the determination coefficient of is about 74%. Therefore, 74% of dependent variable explained by the independent variables. In addition, the value of F-statistic and its probability is equal to 0.0000 and greater than 0.05 indicates the model is significant. So, the efficiency of model realized.

## RESULTS AND DISCUSSION

**The results of the research hypotheses test:** Assumptions of present study are as follow the main hypothesis: New liquidity indicators has a significant

impact on the predictability of stock returns of companies listed on the Tehran. Regression model used is as follows:

$$\mathrm{Re\,t_{it}} = \beta_0 + \beta_1 CLI_{it} + \beta_2 NLB_{it} + \beta_3 MM_{it}$$
$$\beta_4 CC_{it} + \beta_5 Lambda_{it} + \beta_6 OC_{it} + \varepsilon_{it}$$

Where:
$Ret_{it}$ = Returns
$CLI_{it}$ = Comprehensive index of liquidity
$NLB_{it}$ = Net cash balances
$MM_{it}$ = Compliance procedures of current debt and receivables maturities
$CCC_{it}$ = Cash conversion cycle
$Lambda_{it}$ = Method Lambda (to calculate liquidity)
$OC_{it}$ = Index of adjusted cash conversion cycle

**First sub-hypothesis:** A comprehensive index of liquidity has a significant impact on the predictability of stock returns of companies listed on the Tehran. The model used for this hypothesis is as follows:

$$\mathrm{Re\,t_{it}} = \beta_O + \beta_1 CLI_{it} + \varepsilon_{it}$$

According to the results presented in Table 4-8, the number one sub-hypothesis tested. As the results and estimated coefficient of comprehensive index variable for liquidity shows and since this coefficient is equal to 0/624151, therefore there is a positive impact between the comprehensive index of liquidity and the predictability of stock returns of companies listed on the Tehran. The t-statistic should be examined to determine the significance of this relationship.

As noted before, the t-statistic calculated for the variable was is equal and Prob. = 0/000 that indicates there is a significant relationship between 2 variables in confidence level of 95%. Therefore null hypothesis is rejected. Regression model by replacing the obtained coefficient of determination is as follows:

$$\mathrm{Re\,t_{it}} = \beta_O + 0.624151 CLI_{it}$$

**The second sub-hypothesis:** Net cash balances has a significant and positive impact on the predictability of stock returns of companies listed on the Tehran. The model used for this hypothesis is as follows; To test the second hypothesis like one hypothesis, based on the results presented in Table 8, estimated coefficient of Net cash balances variable is equal to 0/514721 and t-statistic and estimated coefficient are is equal to 8/635920 and 0/000, respectively. So, there is a positive and significant impact between net cash balance and predictability of stock returns of companies listed on the Tehran.

Therefore null hypothesis is rejected. Regression model by replacing the obtained coefficient of determination is as follows:

$$Ret_{it} = \beta_O + 0.514721NLB_{it}$$

**The third sub-hypothesis:** Compliance procedure of current debt and receivables maturities has a significant and positive impact on the predictability of stock returns of companies listed on the Tehran. The model used for this hypothesis is as follows:

$$Ret_{it} = \beta_O + \beta_3 MM_{it} + \varepsilon_{it}$$

As can be seen from the model estimated, estimated coefficient and Prob value for compliance procedure of current debt and receivables maturities variable = 0/06794 and 0/0012, respectively. These results indicates that there is a positive and significant impact between compliance procedure of current debt and receivables maturities and predictability of stock returns of companies listed on the Tehran. Therefore null hypothesis is rejected. Regression model by replacing the obtained coefficient of determination is as follows:

$$Ret_{it} = \beta_O + 0.06794MM_{it}$$

**The Fourth sub-hypothesis:** Cash conversion cycle has a significant and positive impact on the predictability of stock returns of companies listed on the Tehran. The model used for this hypothesis is as follows:

$$Ret_{it} = \beta_0 + \beta_4 CCC_{it} + \varepsilon_{it}$$

Based on the results presented in Table 8, the number four sub-hypothesis tested. As the results and estimated coefficient of cash conversion cycle variable shows and since this coefficient is equal to 0/033417, therefore, there is a positive impact between cash conversion cycle and the predictability of stock returns of companies listed on the Tehran in Tehran Stock Exchange. The t-statistic should be examined to determine the significance of this relationship. As noted before, the t-statistic calculated for the variable is equal to 4/86 and Prob. = 0/000 that indicates there is a significant relationship between 2 variables in confidence level of 95%. Therefore the null hypothesis of fourth hypothesis is rejected. Regression model by replacing the obtained coefficient of determination is as follows:

$$Ret_{it} = \beta_0 + 0.033417CCC_{it}$$

**The fifth sub-hypothesis:** Lambda method (to calculate liquidity) has a significant and positive impact on the predictability of stock returns of companies listed on the Tehran. The model used for this hypothesis is as follows:

$$Ret_{it} = \beta_0 + \beta_5 Lambda_{it} + \varepsilon_{it}$$

To test the fifth hypothesis like one hypothesis, based on the results presented in Table 8, estimated coefficient of Lambda method (to calculate liquidity) variable is equal to 0/167and t-statistic and Prob. = 2/42 and 0/0156 respectively. So, there is a positive and significant impact between Lambda method (to calculate liquidity) and predictability of stock returns of companies listed on the Tehran. Therefore, the null hypothesis of fifth hypothesis is rejected. Regression model by replacing the obtained coefficient of determination is as follows:

$$Ret_{it} = \beta_0 + 0.167218Lambda_{it}$$

**The six sub-hypothesis:** Index of adjusted cash conversion cycle has a significant and positive impact on the predictability of stock returns of companies listed on the Tehran. The model used for this hypothesis is as follows:

$$Ret_{it} = \beta_0 + \beta_6 OC_{it} + \varepsilon_{it}$$

To test the six hypothesis based on the results presented in Table 8, estimated coefficient of index of adjusted cash conversion cycle variable is equal to 3/81472 and t-statistic and Prob. = 3/02 and 0/00018, respectively. So, there is a positive and significant impact between index of adjusted cash conversion cycle and predictability of stock returns of companies listed on the Tehran. Therefore the null hypothesis of six hypothesis is rejected. Regression model by replacing the obtained coefficient of determination is as follows:

$$Ret_{it} = \beta_0 + 0.81472OC_{it} + \varepsilon_{it}$$

As observed, all sub-hypotheses related to study design were approved Which indicates the new liquidity index has a significant impact on predictability of stock returns of companies listed on the Tehran. Therefor, the main hypothesis is confirmed.

## CONCLUSION

In present study, descriptive statistics were suggested, then the hypotheses were tested using econometric models and based on the results of estimating the model, the research hypotheses were investigated. According to the results of hypotheses

analysis found that all the assumptions were approved. We pointed out some limitations of the study. Some recommendations arising from expected results and findings will present. We hope while it is useful to users of accounting information become a guideline for future researches. The aim of current study was to investigate the impact of new liquidity index on predictability of stock returns of companies listed on the Tehran. This study is applied, descriptive-survey research and the relationship between the variables is causal. In these study statistical methods and company's history were used to confirm or refute the hypotheses. The data for this study were obtained through library and field which used to develop theoretical foundations and theoretical arguments, books and Latin and Persian studies.

The necessary information to test the hypotheses was collected from the Tehran Stock Exchange Lists to address www. Irbourse.com and Website www.Rdis.Com owned (Center of Research and Islamic Studies of Tehran Stock Exchange) and stock information's site www.codal.com.. The research population was consisted of companies listed on Tehran Stock Exchange (635 companies) and sample size was 125 and sampling method was removal.

## REFERENCES

Bidram, R., 2001. Along with Econometrics. 1st Edn., Manshour Bahrevari Publishing, Tehran, Iran,.

Gholamreza, K., 2002. Research Methods in Management. Publishing Center of Islamic Azad University, Tehran, Iran,.

Maryam, S.P., 2004. The effect of excess liquidity on stock returns of companies listed on the stock exchange. Master Thesis, Shahid Beheshti University of Medical, Tehran, Iran.