

# PERFORMANCE EVALUATION OF STOCK BASED ON RATE OF RETURN, LIQUIDITY AND RISK OF FIRMS LISTED IN STOCK EXCHANGE IN PROSPERITY AND RECESSION PERIODS

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**Abstract:** *The focus of this study is performance evaluation of stocks based on ROR, liquidity and risk in recession and prosperity periods among the firms listed in stock exchange. For this purpose, 317 active firms which were not inactive or traded for three consecutive months were studied. Findings show that average return of newly listed firms is higher than that of other firms in prosperity period. There is no significant difference in risk of newly listed firms and that of other firms in the prosperity period. There is no significant difference in liquidity of newly listed firms and that of other firms in prosperity period. Moreover, there is no significant difference in average return of newly listed firms and that of other firms in recession period. There is no significant difference in risk of newly listed firms and that of other firms in recession period. The level of liquidity is lower in newly listed firms than other firms; that is, newly listed firms are more liquid in recession period.*

**Keywords:** *Stock performance, return, risk, liquidity.*

## 1. INTRODUCTION

As a financial decision, investment is always associated with two components, risk and return, which together present various options of investments. One of these investments is the investment in securities which creates stock exchange markets around the world and plays a significant role in the economy. However, investment in securities is associated with return, risk and liquidity. In the last two decades, transactional costs have significantly decreased; this reduction in transactional costs has increased stock exchanges in the stock markets worldwide. Banerjee et al., (2007) stated that the increase in stock exchange has been followed by accelerated liquidity in the stock markets worldwide. Along with improving quality of stock liquidity, the crisis caused by risky financial instruments in 2000-2002 and the financial recession crisis in 2008-2009 were the most important events occurred. The bitter outcome of

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suddenly falling total index undermined many stock exchanges worldwide. These events have encouraged researchers and financial analysts to identify the factors effective in prediction of severe drops in the stock price. One of the controversial factors in assessing the risk of falling stocks is stock liquidity (Zheng et al., 2015). Generally, stock liquidity is related to the stock owned by entities. For example, Abdetabrizi et al., (2011) emphasized that higher percent of stock ownership by the private sector compared to state institutions is associated with greater stock liquidity. Dianati et al., (2012) showed that lower institutional investor ratio is associated with higher stock traded whereby higher stock liquidity. On the other hand, they stated that higher level of stock owned by financial institution will lead to higher control over the management, whereby higher potential accumulation of bad news. Along with information asymmetry, higher stock liquidity seems dangerous. In total, liquidity and its role in the risk of stock price drop depends on the factors such as institutional investors, transactional costs and manipulation in bad news. It is essential to understand behavior of initial public offerings in comparison with other firms in various periods of recession and prosperity of the stock market, considering three indicators including risk, return and liquidity (Begenau, 2015). This will be more evident with regard to the widespread plans of the previous government and emphasis of the new government on privatization and implementation of the Article 44. Privatization will succeed and achieve its long-term goals by reasonable returns along with proper risk and liquidity to new shareholders. For the investors, the most important factor in investment and decision to buy a stock is the expected, reasonable return along with reasonable risk and good liquidity considering other options of investment (Dhar & Sinha, 2015). In fact, profitability and reasonable return of the investors enable the stock market to achieve one of its missions which is mobilization and optimal allocation of capital. Hence, this study addresses initial public offerings in the stock market and evaluates the performance of these stocks based on three important indicators including return, risk and liquidity.

## 2. LITERATURE REVIEW

To evaluate performance, this study measures three important indicators: return, risk and liquidity, as discussed below. Return refers to the profit from a change in stock price plus dividend and cash dividend during a given period (Jahankhani & Parsaeian, 1999). Risk refers to the expected value of deviation of returns from the expected return. Galitz (1995) defines risk as any fluctuation in any benefit. This definition reveals the fact that possible future changes, both positive and negative, for a particular index expose risk. Therefore, changes may be profitable or unprofitable. Gilb defines risk as any phenomenon which can deviate the expected outcome of investor. Risk is written as:

$$y - E(Z) = dz - E(z) + \varepsilon \quad (1)$$

where,  $y$  is riskier asset than  $Z$ , if  $\varepsilon$  is not zero ( $\varepsilon$  is a random variable with zero mathematical expectation, independent of  $Z$ ); that is:

$$E(\varepsilon | Z) = E(\varepsilon) = 0 \quad (2)$$

In this study, risk is measured by calculating standard deviation. Liquidity refers to stock exchange capacity in the shortest time possible (OMRI et al., 2003). Stock liquidity is defined as convenience of buying and selling shares without affecting the price of shares. In general, liquidity refers to the ease of buying and selling a product without a significant change in its price (Etemadi & Rasaeian, 2010; Rahmani, et al., 2010). One of the characteristics of an ideal efficient market is the lack of transaction costs and high liquidity. Hence, liquidity can be considered as a measure of market efficiency, particularly in terms of information, and used widely in evaluating the factors effective on delivery of useful information (Chung et al., 2009). Stock liquidity is examined in both terms of market microstructure and corporate-financial aspects. The general view is that stock liquidity has a feedback effect on firm value by reducing capital cost and influencing investments (Foucault et al., 2013). Furthermore, stock liquidity can increase information content of stock price; consequently, managers are informed of the stock price with information content and adopt decisions to increase firm value. In presence of agency problems, stock liquidity has an economic effect on firm value through corporate governance (Cheung et al., 2015). Moreover, stock liquidity refers to operating ratio of the average monthly turnover of shares during a certain period (Abdetabrizi, 2011). In this study, liquidity is calculated by following formula:

$$L = \frac{1}{\frac{1}{x_1} + \frac{1}{x_2} + \frac{1}{x_3} + \frac{1}{x_4} + \frac{1}{x_5} + \frac{1}{x_6}} \quad (3)$$

where,  $L$  denotes liquidity,  $x_1$  is the number of buyers,  $x_2$  is the number of transactions,  $x_3$  is the number of trading days,  $x_4$  is the average value of transactions during the period,  $x_5$  is the number of shares, and  $x_6$  is the average daily value of the firm.

## Background

An and Zhang (2013) examined the negative relationship between stock liquidity and risk of stock price drop focusing on corporate governance incentives. They noted that higher stock liquidity is not easily traced for ownership of holding companies; thus, the board of director is not controlled by institutional owners. Therefore, bad news is not accumulated in the company and the board is easily monitored. Johnson (2008) states that liquidity can be examined in both levels of individual securities such as a certain share and overall stock market. Liquidity is defined as the ability to buy or sell arbitrary amount of securities at the market price in short term. This is valuable

because securities with higher liquidity have higher prices than securities with lower liquidity under equal conditions. They assert that liquidity increases market ability to attract massive transactions without severe fluctuations in price assuming market transparency. Evaluating the effect of stock liquidity on market conditions, Chen and Zolotoy (2013) argued that stock liquidity could be positively related to the risk of stock price drop under favorable market conditions. Assuming stock market transparency, a significant negative relationship can be obtained between stock liquidity and reduced stock price providing that bad news are published. Dianati et al., (2012) examined the effect of institutional investors on reduced risk of stock price drop. They believed that an ultimate level exists for accumulating bad news; by reaching the ultimate level, sudden publication of bad news will result in stock price drop. Using data from Warsaw Stock Exchange, Zarembka and Konieczka (2013) evaluated momentum, value, size and liquidity in the Polish market, and found that the portfolio formed on the basis of size (market value), value (book value to market value ratio), momentum (annualized rate of return excluding dividends for 12 months prior to 31 November) and liquidity (average daily turnover in the previous month) had positive stock returns. Yahyazadefar and Khoramdin (2008) evaluated liquidity and risk of illiquidity on excess return in TSE; they found that all the variables studied had a significant effect. That means that illiquidity and firm size had a negative effect on excess return, while excess return and book value to market value ratio had a positive effect on excess return. Dittmar and Smith (2007) addressed corporate governance and value of cash holdings to find out how good corporate governance increases firm value. They found a relationship between good corporate governance and cash balances; they believed that good corporate governance increases firm value through better use of the cash. Jin and Myers (2006) presented a model which showed that information asymmetry gives managers the opportunity to hide bad news from investors; eventually, when these accumulated bad news are published in the firm, they will cause a strong negative adjustment in stock return (or the same stock price drop). Hong and Stein (2003) argued that information asymmetry could potentially drop the stock price. As their model showed, if information asymmetry leads to different decisions and publication of bad news, stock price drop will depend on shareholders as well as stock liquidity. Abzari, Samadi and Teymouri (2012) evaluated the factors effective on risk and investment return in financial products using the hybrid revenue maximization model in uncertainty. Their results indicated the effect of macroeconomic factors on systematic risk of investment in financial products, microeconomic factors on non-systematic risk of investment in financial products and non-economic factors on overall risk of investment in financial products. They also found a negative correlation between non-economic factors of perceived risk and risk propensity. Lischewski and Voronkova (2012) addressed whether stock liquidity as well as firm size and value are effective factors on stock return. Their results showed that stock liquidity compared to firm size and value had no significant effect on stock

return. Unlike Dianati et al., (2012), Abdetabrizi (2011) stated that the presence of state investors in stock exchange prevents publication of bad news and control on listed firms; moreover, it disturbs stock liquidity. According to literature, the relationship between stock liquidity and potential stock price drop has not been studied transparently. Rahmani, Hoseyni and Rezapour (2010) examined the role of liquidity in discovering asset prices, distributing financial risk and reducing transactional costs and identifying its effective factors. They considered institutional ownership as a measure of monitoring and informative functions of institutions and focus of institutional ownership. Their results showed a positive significant relationship between institutional ownership and stock liquidity; moreover, institutional ownership reduced stock liquidity. These relationships were observed for both transactional measures such as turnover, float stock and Amihud ratio and informative measures such as ask-bid spread.

## **Hypotheses**

*Hypothesis 1:* There is a significant difference in average return of newly listed firms and that of other firms in prosperity period.

*Hypothesis 2:* There is a significant difference in risk of newly listed firms and that of other firms in prosperity period.

*Hypothesis 3:* There is a significant difference in liquidity of newly listed firms and that of other firms in prosperity period.

*Hypothesis 4:* There is a significant difference in average return of newly listed firms and that of other firms in recession period.

*Hypothesis 5:* There is a significant difference in risk of newly listed firms and that of other firms in recession period.

*Hypothesis 6:* There is a significant difference in liquidity of newly listed firms and that of other firms in recession period

## **Materials and Method**

The studied population consists of 420 companies listed in the Tehran Stock Exchange (TSE) by 2005. Considering the selected period (2002-2005), the population is surveyed during this period, excluding those whose trademarks were regularly stopped for more than three months or not traded. Given the selected period, this can be considered as a time sample of population; out of 420 companies, 317 companies are selected as representative samples. A checklist of variables is developed for which the required information is extracted by reviewing documents available in the stock exchange. Few shares are selected as samples; their return is calculated and matched to the software to ensure accuracy of data and accuracy of software calculations as well as reliability and validity of the instruments.

## Calculation of Variables

Variables studied include return, risk and liquidity which are calculated as follows:

### Return

Return per share is calculated based on prices at the beginning and end of the period and dividend at that period using the following formula:

$$R_{it} = \frac{P_{it} - P_{it-1} + D_{it}}{P_{it-1}} \quad (4)$$

where,  $R_{it}$  is rate of return on share  $i$  at time  $t$ ,  $P_{it}$  is price of share  $i$  at time  $t$ ,  $P_{it-1}$  is price of share  $i$  at time  $t-1$  and  $D_{it}$  is dividend of share  $i$  in time  $t$ . Dividend belongs to shareholders at periods when the firm has assembly. Dividend paid in a period reduce stock price. Therefore, substitution of  $D_{it}$  in the formula for rate of return can also be considered as an adjustment factor. In periods when the company has no assembly,  $D_{it}$  is zero. Depending on decisions of the assemblies,  $D_{it}$  is given to shareholders in various forms as follows:

(a) The formula for calculating return on the dividend paid:

$$R_{it} = \frac{P_{it} - P_{it-1} + D_{it}}{P_{it-1}} \quad (5)$$

$D_{it}$  is equal to the cash dividend.

(b) The formula for calculating return on the bonus shares granted (at the rate of  $\alpha$  percent):

$$R_{it} = \frac{(1 + \alpha)P_{it} - P_{it-1} + D(1 + \alpha)}{P_{it-1}} \quad (6)$$

(c) If the general assembly approves  $\alpha$  percent capital increase (priority), the formula for calculating return per share is as follows:

$$R_{it} = \frac{(1 + \alpha)P_{it} - P_{it-1} - \alpha(1000) + D(1 + \alpha)}{P_{it-1} + \alpha(1000)} \quad (7)$$

Nominal value of each share is 1000 Rials.

Note that, all returns here are calculated on a weekly basis. In fact, nearly 50 weekly returns are calculated for each share per year.

### Risk

Risk is the standard deviation of weekly returns per share.

## Liquidity

Liquidity index which is calculated by the software Pars Portfolio using the following formula is used for liquidity:

$$L = \frac{1}{\frac{1}{x_1} + \frac{1}{x_2} + \frac{1}{x_3} + \frac{1}{x_4} + \frac{1}{x_5} + \frac{1}{x_6}} \quad (8)$$

where, L denotes liquidity,  $x_1$  is the number of buyers,  $x_2$  is the number of transactions,  $x_3$  is the number of trading days,  $x_4$  is the average value of transactions during the period,  $x_5$  is the number of shares and  $x_6$  is the average daily value of the firm. This numerical ratio calculates liquidity of the stock considering the factors substituted in the formula. A coefficient is calculated for each company; then, consecutive ranks of the shares are calculated in terms of liquidity by sorting those values. This means that if L calculated in the formula is a larger value for each share, the share will be more liquid and its rank will be better than other shares.

## Results

T-test is used to examine hypotheses.

*Hypothesis 1:* There is a significant difference in average return of newly listed firms and that of other firms in prosperity period.

Significance level is smaller than error level; thus,  $H_0$  is rejected (Table 1). Therefore, there is a significant difference in average return of newly listed firms and that of other firms in prosperity period at 95% confidence. Given the positive t calculated, mean of the first group is larger than the second group (Table 2). That is, average return of newly listed firms is higher than that of other firms in prosperity period.

**Table 1**  
Descriptive findings for return of newly listed firms and other firms in prosperity period

Group	Number	Mean	Standard deviation
Newly Listed	74	1.83	2.18
Other	667	0.92	1.41

**Table 2**  
Difference in return of newly listed firms and that of other firms in prosperity period

t calculated	Degrees of freedom	Sig.	Error level	Test result
3.51	79.92	0.001	0.05	$H_0$ rejected

*Hypothesis 2:* There is a significant difference in risk of newly listed firms and that of other firms in prosperity period.

Significance level is greater than error level; thus,  $H_0$  is accepted. Therefore, there is no significant different in risk of newly listed firms and that of other firms in prosperity period at 95% confidence (Table 3 and Table 4)

**Table 3**  
Descriptive findings for risk of newly listed firms and other firms in prosperity period

Group	Number	Mean	Standard deviation
Newly Listed	74	54.74	85.33
Other	667	61.95	246.07

**Table 4**  
Difference in risk of newly listed firms and that of other firms in prosperity period

<i>t</i> calculated	Degrees of freedom	Sig.	Error level	Test result
-0.25	739	0.80	0.05	$H_0$ accepted

*Hypothesis 3:* There is a significant difference in liquidity of newly listed firms and that of other firms in prosperity period.

Significance level is larger than error level; thus,  $H_0$  is accepted. Therefore, there is no significant difference in liquidity of newly listed firms and that of other firms in prosperity period at 95% confidence (Table 5 and Table 6).

**Table 5**  
Descriptive findings for liquidity of newly listed firms and other firms in prosperity period

Group	Number	Mean	Standard deviation
Newly Listed	76	99.08	41.78
Other	667	107.71	47.47

**Table 6**  
Difference in liquidity of newly listed firms and that of other firms in prosperity period

<i>t</i> calculated	Degrees of freedom	Sig.	Error level	Test result
-1.52	741	0.13	0.05	$H_0$ accepted

*Hypothesis 4:* There is a significant difference in average return of newly listed firms and that of other firms in recession period.



Significance level is larger than error level; thus,  $H_0$  is accepted. Therefore, there is no significant difference in average return of newly listed firms and that of other firms in recession period at 95% confidence (Table 7 and Table 8).

**Table 7**  
**Descriptive findings for average return of newly listed firms and other firms in recession period**

Group	Number	Mean	Standard deviation
Newly Listed	54	-0.01	0.85
Other	552	-0.18	0.78

**Table 8**  
**Difference in average return of newly listed firms and that of other firms in recession period**

<i>t</i> calculated	Degrees of freedom	Sig.	Error level	Test result
1.45	604	0.15	0.05	$H_0$ accepted

*Hypothesis 5:* There is a significant difference in risk of newly listed firms and that of other firms in recession period.

Significance level is larger than error level; thus,  $H_0$  is accepted. Therefore, there is no significant difference in risk of newly listed firms and that of other firms in recession period at 95% confidence (Table 9 and Table 10).

**Table 9**  
**Descriptive findings for risk of newly listed firms and other firms in recession period**

Group	Number	Mean	Standard deviation
Newly Listed	54	35.01	31.30
Other	552	33.81	175.01

**Table 10**  
**Difference in risk of newly listed firms and that of other firms in recession period**

<i>t</i> calculated	Degrees of freedom	Sig.	Error level	Test result
0.05	604	0.96	0.05	$H_0$ accepted

*Hypothesis 6:* There is a significant difference in liquidity of newly listed firms and that of other firms in recession period.

Significance level is smaller than error level; thus,  $H_0$  is rejected. Therefore, there is no significant difference in liquidity of newly listed firms and that of other firms in recession period at 95% confidence (Table 11).

Given the positive  $t$  calculated, mean of the first group is smaller than the second group. That is, liquidity of newly listed firms is lower than that of other firms in recession period. Thus, newly listed firms are more liquid in recession period (Table 12).

**Table 11**  
Descriptive findings for liquidity of newly listed firms and other firms in recession period

<i>Group</i>	<i>Number</i>	<i>Mean</i>	<i>Standard deviation</i>
Newly Listed	52	88.71	48.25
Other	552	125.38	51.92

**Table 8**  
Difference in liquidity of newly listed firms and that of other firms in recession period

<i>t calculated</i>	<i>Degrees of freedom</i>	<i>Sig.</i>	<i>Error level</i>	<i>Test result</i>
-4.90	602	0.00	0.05	H <sub>0</sub> rejected

### 3. DISCUSSION AND CONCLUSION

The ultimate goal of a firm is to maximize profits and create more value for equity. Management makes efforts to achieve maximum profit and efficiency using the fewest resources. If institutional factors which have the major shares put pressure on the board of directors, efficiency will decline and bad news will be gradually accumulated; this can drop the stock price. Liquidity is directly linked to the combination of shareholders and transactions. As the current results show, higher liquidity is associated with lower risk of stock price drop. In MANOVA, performance of the newly listed stock is better than other stocks. Average return, risk and liquidity of the selected sample are compared to the average return, risk and liquidity of other firms in the recession period. Student t-test shows no significant difference in average return and risk of the newly listed firms and other firms in recession period, while there is a significant difference in liquidity of the newly listed firms and other firms in recession period; thus, newly listed firms are more liquid. Higher liquidity is associated with lower risk of stock price drop. In general, the risk of stock price drop is a systematic risk, while the risk of stock liquidity is a non-systematic risk due to the presence of institutional ownership. Given the significance of return, risk and liquidity in decision-making process of investors, as well as the significant role of these three indicators in success of the firms to be listed in stock exchange, the present results can be helpful in periods of recession and prosperity. As MANOVA showed, performance of newly listed firms is better than that of other firms in recession and prosperity periods. Nevertheless, t-test results can further help investors and companies to be listed in the stock exchange.

For example, investors need to pay more attention to their risk taking capacity in prosperity period to be listed in the stock exchange. Moreover, they particularly need to consider liquidity in this period. Furthermore, these companies need to reduce their risk and increase liquidity through major shareholders. Investors need to consider the expected return and their risk taking capacity in recession. Moreover, they need to increase return and reduce their risk in this period through major shareholders to be listed in the stock exchange.

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