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A SURVEY ON FIRM PERFORMANCE OF THE LISTED TUNISIAN COMPANIES [*]

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ABSTRACT

In this paper, we present an original essay that aims to discuss the relationship between return on equity and illiquidity in some selected firms in Tunisian Stock Exchange. We concentrate especially on the effect of the impact of cost liquidity on firm performance. The result of the survey indicates that there is a positive relationship between firms' performance and illiquidity. In other words, firms' performance includes an illiquidity premium which compensates the transaction costs borne by the investors in the market.

Keywords: Firm performance, Illiquidity, Return on equity; Cost Liquidity; Tunisian stock exchange.

INTRODUCTION

Liquidity play an important role on performance of firms listed in Stock Exchange. Few theoretical studies dealt with the microstructure market theory regarding the relationship between the stock return and stock liquidity. The first study was carried out by Amihud and Mendelson (1986). This study involves a nonlinear relationship between the required returns and the degree of liquidity of financial assets. According to the theory of the participation costs of Merton (1987) or even to the study of Amihud and Mendelson (2002), the contribution of the service immediacy cost is reflected in the additional discount on the capital cost and the firms' value. Transaction costs are an important determinant of companies' capital cost. Investors are willing to offer a liquidity premium to the most liquid securities and vice versa request an illiquidity premium on the less liquid securities.

The remainder of the paper is organized as follows. Section 2 reviews the literature. In Section 3, we describe the data, the variables in our analysis, and their characteristics. Empirical results are presented and discussed in section 4. Finally, Conclusions are given in Section 5.

LITERATURE REVIEW

According to Demsetz (1986) there is a positive relationship between the stock returns and the proportion of exchange initiated in the overall trading volume by indicating that investors, due liquidity, can protect themselves against the exchange on informational ground by adopting a purchasing strategy and title safekeeping, but in this case, they bear illiquidity

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cost. However, Brennan and Subrahmanyam (1996) pointed out that the measure of the liquidity degree of financial assets through the relative price range is open to criticism insofar as it contains a component of information asymmetry for which the market requires a higher profitability. Jacoby, Fowler and Gottesman (2000) studied theoretically the relationship between the rates of returns required by the investors and the relative spread.

In an empirical study, Hamon and Jacquillat (1997) confirmed the results of Amihud and Mendelson (1986) who consider the quoted spread as a measure of the liquidity degree. Actually, they showed a positive relationship between the rate of returns on the securities listed on the ACC system during the period between July 1991and 1996, and the price range. Using time-stamped data relating to the 1991/1996 period, these authors found different liquidity measures and determined the correlation matrix between them. Since none of these measures was totally satisfactory, they chose the quoted spread and the public float as liquidity measures. By reducing the rate of returns on the quoted spread and on the risk, they found that the rates of the equilibrium return are positively correlated with the risk and with the quoted spread; however they are negatively correlated with the float and market capitalization.

Hamon and Jacquillat (1997) underlined a relationship between the rate of returns and the liquidity measured by either the relative quoted spread or the free float to show the existence of a monthly liquidity premium. Therefore, they indicated that the rate of returns decreases with the float and capitalization, and increases with the relative quoted spread. Datar, Naik and Radcliffe (1998) show a negative relationship between the rates of returns generated by non-financial firms listed on the New York Stock Exchange (NYSE) over the period between July 31, 1962, and December 31, 1991 and the degree of liquidity measured by the ratio of the turnover rate. The results of their study confirm the presence of a liquidity premium and the absence of a January effect (a general increase in stock prices during the month of January).

Chordia, Roll and Subrahmanyam (2001) noted that the quoted spread; the depth and volume of transactions are more volatile than the returns. The authors studied the inter-temporal variation of liquidity, depth and volume of the transactions of financial assets traded on the NYSE over the 1988-1998 periods. The data used in this study include the displayed quoted spread; the relative quoted spread, the depth, volume and number of transactions. The authors show that the relationship between the rates of returns and the quoted spread is positive. This result is consistent with the concept of liquidity premium. In addition, they point out to a significant negative relationship between the trading volume and the rate of returns expected on the NYSE and AMEX. This seems to be consistent with the theoretical results found by Amihud and Mendelson (1986).

In this context, Chordia, Subrahmanyam and Anshuman (2001) showed the impact of the exchange variability on the rates of the expected returns of securities traded on the NYSE and AMEX (American Stock Exchange) during the period between January 1965 and December 1996. These authors claim that there is a negative relationship between the rate of the required returns and the exchange variability measured, on the one hand, by the transaction volume, and the other hand, by the turnover rate. This relationship is statistically and economically significant. On the Oslo Stock Exchange, Naes (2004) found a significant relationship between the monthly financial performance portfolios of the listed companies with the lowest quoted spreads and companies with large-sized quoted spreads (respectively 0.83% and 3.03%), a relationship that lasts for five years. This result confirms the analysis of Amihud and Mendelson (1986) and Brennan and Subrahmanyam (1996) on the positive relationship between the expected returns of a security and the size of the quoted spreads in the U.S. markets. In this context, Sjo (1998) found a positive relationship between the relative quoted spreads and the exchange frequency and the returns on securities in the Norwegian

market. As for Drew, Veeraraghavan and Marsden (2006), a sample of Australian shares, they analyzed if liquidity costs measured by the quoted spreads and the turnover affect the stock returns. Their results show that small and less liquid firms generate positive risk premiums after controlling the market returns and firm's size. Besides, Amihud and Mendelson (2006) examined the effects of liquidity on prices and returns while showing that liquidity is an important factor in assessing the capital.

Fang et al. (2009) affirmed that stock liquidity improves firm performance through a feedback effect where liquidity encourages the entry of informed investors who make prices more informative to stakeholders. They point out that liquidity also improves firm performance by raising the efficiency of performance sensitive managerial compensation. An interesting result that should be explored here is that they find a positive relationship between liquidity and performance. Asle et al. (2013) investigated the relationship between Tobin's Q and illiquidity in some selected firms in Tehran Stock Exchange. Their results indicate that there is a negative relationship between illiquidity and Tobin's Q but the ratio is on seven percent.

SAMPLE, DATA AND METHODOLOGY

We first collect data on all stocks listed on the Tunis Stock Exchange. We delete from our sample stocks that are illiquid. In addition, we also eliminate firms with their shares are not traded over long periods. In addition, we exclude companies whose financial statements are not fully available during the study period that is to say between 2001 and 2007. As a result, the final sample includes 210 observations over seven years for 30 Tunisian firms listed continuously on the Tunisian stock market operating in various activities in seven key areas: industry, consumer goods, consumer services, health, telecommunications, financial firms and oil and gas.

TABLE 1
Sample composition

S. No.	Sector	Number of Firms
1	Industry	3
2	Consumer Goods	4
3	Consumer Services	3
4	Health	1
5	Telecommunication	1
6	Financial Gas	17
7	Oil and Gas	1
	Final Sample	30

Variables of the Analysis

Measures of firm performance. For Charreaux (1997), performance measures fall into two categories. The first category reflects an exante predictive quantification concern about performance, including Tobin's Q (firm's market value / economic asset book value) and the ratio of Marris (Market Capitalization / Book equity). The second category is about the measures resulting from the portfolio theory, which are used mainly ex-post, in the hope of assessing performance achieved over a given period.

The measures should be selected according to the capital market values and not to the accounting values which can at best no more than proxies. In order to be relevant, the measurement must be risk-adjusted. When only the profitability of the investors' stock market portfolios is reduced due to illiquidity cost, only the financial returns at market value

should be affected. Consequently, we use, in our study, the rate of return on equity estimated according to the market values as an explained variable. In order to examine the relationship that might exist between liquidity and performance, we suggest a model of which the dependent variable is the rate of return on equity at market value. This variable is called Return and will be calculated as follows:

Return on equity at market value = Net profit / the market value of equity

Different measures of stock liquidity. Lesmond et al. (1999) and Lesmond (2005) suggested new liquidity measures for the emerging markets when no other means are available. However, our data contain sufficient information to cast these direct daily measurements. We used different indicators that give us some information about the liquidity cost, namely the relative quoted spread, the relative effective spread and lambda. Like Rhee and Wang (2009) and Fang et al. (2009), we suggest measuring the stock liquidity using the relative quoted spread (RQS), the relative effective spread (RES) and lambda then, we will separately study the effect of these indicators. The liquidity measures are defined as follows:

The relative quoted bid-ask spread (RQS) is defined as the quoted ask price minus the quoted bid price scaled by their midpoint.

$$RQS_t = \frac{Ask_t - Bid_t}{(\frac{Ask_t + Bid_t}{2})}$$

The relative effective bid-ask spread (RES) is defined as two times the absolute value of the difference between the transaction price and the quoted midpoint, scaled by the quoted midpoint.

$$RES_t = \frac{2\left|p_t - \frac{Ask_t + Bid_t}{2}\right|}{\frac{Ask_t + Bid_t}{2}}$$

The lambda (LAM) is defined as the quoted ask price minus the quoted bid price scaled by the number of shares at quoted ask and quoted bid.

$$\lambda_t = \frac{Ask_t - Bid_t}{Q_{task} + Q_{tbid}}$$

Control variables

The size. The impact of the firm's size on its performance is ambiguous: on the one hand, taking into account economies of scale implies a positive impact on the extension of a company, and on the other hand, the rise of new organizational costs from a certain level may exceed the benefits. These two effects suggest the existence of an optimal size for the company as a result of an arbitrage between economies and diseconomies of scale. For Wright et al. (1996), large firms have higher performance expectations when they have growth opportunities. Their results state that the effect of size is positive. The empirical study carried out by Hall and Weiss (1967), on a sample of 341 companies over a period between 1956 and 1962, confirms the positive impact of size on the performance of companies. Inversely, Shepherd (1972), found a negative relationship between the size and the profit rate on a sample of 231 companies between 1956 and 1959. Cable and Steer (1978) found a positive and significant impact of the size on the profit in firms with non-optimal internal organization, and a slightly negative impact in well-organized firms. However, Radice (1971) found no significant relationship. Recently, Ng, Yuce and Chen (2008), on a sample of 4315 Chinese companies, have examined the relationship between State ownership and performance. They confirm that size is negatively correlated with performance measured by

the Tobin Q. The firm's size is measured by the natural logarithm of the firm's market capitalization at the end of December of each year.

Growth rate. The relationship between growth and performance is negative insofar as business leaders foster growth more than the profit maximizing by adopting their own interests. However, Radice (1971) asserts that a 1% increase of the growth rate averagely follows on from a 0.4% increase of the profit rate for 89 companies over the 1957-1967 periods. Furthermore, Geroski et al. (1997) stipulate that growth cannot automatically be achieved at the expense of profitability. These authors show that the leader sacrifices an absolutely stable return rate for temporally high random revenues. On the other hand, a leader who stakes his reputation on the growth of his company places a limit on an unpredictable regular basis. With a view to the agency theory, high growth can also easily help set up a system of incentives based on the promotion which could conversely lead to improved performance. Like in several previous studies, we try to uncover the impact of the turnover growth through a quantitative variable reflecting the turnover changes.

The portfolio turnover rate. The intensity of the transactions involving a security can be interpreted as a good control indicator by the financial market. We can expect a positive effect of the portfolio turnover on performance. A substantial volume of transactions implies that the security receives a specific attention from the financial market, the thing which compels the leaders to manage in accordance with the investors' expectations. Therefore, to set pure liquidity effect apart from that of financial market supervision, as a governance mechanism, we had better introduce this variable measured by the turnover rate. It is calculated by dividing the number of shares traded each year by the total number of outstanding shares at the end of each year.

The volatility of returns. Risk consideration is an essential element of any investment decision so as not to bring about a non-optimal resource allocation or skew performance assessment. On a sample of 88 industrial companies, Fisher and Hall (1969) showed that risk-exposed firms have an excellent performance. Similarly, Spiegel and Wang (2005) indicated that liquidity is negatively correlated with the returns whereas risk is positively correlated with firm's performance. This variable is measured by the standard deviation of the daily returns, which is calculated, first, on a daily basis and, then on average over a year.

Data Description

Table 2 generates a summary of descriptive statistics (the mean, the standard deviation, the minimum value, the maximum value, the distribution asymmetry coefficient (skewness), the kurtosis coefficient, the Jarque and Bera statistics relating to the dimension of the selected performance, to the statistics of the explanatory variables (relative quoted spread, the relative effective spread and lambda) as well as those of the control variables (growth, risk, turnover and size) for all the firms over the 2001/2007 period.

TABLE 2
Summary Statistics

	Mean	Std	Min	Max	kurtosis	Skewness	JB
Return on equity	7.0520	17.9411	-137.5	95.897	38.42	3.7774	9354
Relative quoted spread RQS(%)	2.0893	1.0826	0.0179	7.5268	6.947	1.4035	205.27
Relative effective spread RES(%)	2.3288	1.3371	0.4413	10.168	9.659	2.0179	530.57
Lambda (LAM)	0.0020	0.00207	$8.96\ 10^{-7}$	0.0223	45.77	5.0176	16884
Growth (GROW)	0.0851	0.2567	-0.7202	2.7027	55.51	5.5867	25212
Risk (RISQ)	0.0201	0.0474	0.0027	0.6893	189.9	13.451	311972

	Mean	Std	Min	Max	kurtosis	Skewness	JB
Turnover (TURN)	0.166	0.1626	0.001	0.796	5.509	1.6435	149.60
Firm size (SIZE)	$1.34\ 10^8$	$2.29\ 10^8$	5877800	$2.61\ 10^9$	67.25	6.6307	37660

Due to the fact that our sample consists of 30 Tunisian companies, the average companies' performance, which is measured by the rate of returns on equity, is 7.0520. Given that the liquidity measures are highly skewed, we use the logarithm of some liquidity measures throughout the analysis. The log transformation of the variables seems to be the most appropriate to identify liquidity. The average relative quoted bid-ask spread is 2.0893 percent while its standard deviation is of the order of 1.0826 percent. These values are confirmed to those previously reported in the literature. The percentage of the range of relative effective price varies between 0.4413% and 10.1672% with an average of 2.3288%. The average turnover, which is 0.166, is very variable. It goes from a minimum of 0.001 to a maximum of 0.796. Lambda produces a changes from the order of 8.96 10-7 to about 0.0223. The mean is 0.0020 for the whole sample with a standard deviation of 0.00207. Similarly, the average size of the firms in the sample is 1.34 108 and the standard deviation is 2.29 108. We therefore decided to use the logarithm for this variable so as to ensure linearity and reduce its variance. The use of the logarithm has the benefit of coping with the problem of scale that might arise due to the small size of the measures of the other variables in the model. All these variables have a positive skewness value well above zero. It is equal to 2.0179 for the relative effective spread. The kurtosis value is also well above 3. It reaches the value of 9.6594 for the effective relative spread and 67.250 for the company's size. The results of the normality assumption indicate that the variable distributions of our study are not normal since the skewness and kurtosis coefficients generate an excessively high JB coefficient (Skewness ≠ 0 and kurtosis ≠ 3).

Implementing multiple regression models requires that any multi-collinearity between the independent variables should be ruled out. We will then check this basic hypothesis for the use of the models before presenting the regression results of.

A bivariate analysis is applied to test the possible presence of multicollinearity between the independent variables. We will calculate Pearson's correlation coefficients by presenting the matrix of the independent variables. As shown in Table 3, all the correlation coefficients are significantly smaller than 0.7, a limit beyond which we are generally exposed to serious problems of multicollinearity.

TABLE 3
Correlation Values among Different Variables

	RQS	RES	LAM	GROW	RISK	TURN	SIZE
RQS	1						
RES	-0.0006*	1					
LAM	0.0782	-0.1006*	1				
GROW	-0.1210**	-0.0178	0.0246	1			
RISK	0.0488	0.1026	-0.0745	0.0406	1		
TURN	-0.1327*	-0.1088	-0.0150	-0.0301	0.1814***	1	
SIZE	-0.4213***	-0.6081***	-0.0926	0.0972	-0.0884	-0.2234***	1

Methodology

Our main objective is to explore what liquidity can affect firm performance. We use a panel data technique and our model is fully described by the following regression:

$$PER_{it} = \beta_0 + \beta_1 LIQ_{it} + \beta_2 GROW_{it} + \beta_3 TURN_{it} + \beta_4 RISQ_{it} + \beta_5 SIZE_{it} + \varepsilon_{it}$$

Where $\varepsilon_{it} = \mu_i + \nu_{it}$

i = 1, ... N and t = 1, ... T

ε_{it} is an error term; μ_i represents a firm-specific effect, fixed or random, ν_{it} is a standard residual term and β_0, β_1, $\beta 2$, $\beta 3$, $\beta 4$, β_5, β_6 are the estimated coefficients of the model.

The performance measure, PER, is measured for firm i over its year t. The measure of liquidity is LIQiy that is calculated for each stock i in year y, this measure is either relative quoted bid ask spread, relative effective bid ask spread or lambda. The control variables in the regression are growth (GROW), turnover (TURN), size (SIZE) and risque (RISQ). We use natural logarithms of relative spreads and firm size to reduce heteroskedasticity.

The methodology used within the framework of our empirical analysis is that of panel data, which presents the advantage of treating jointly the individual effects and the temporal effects, and increasing the degree of freedom and inference exactitude. The panel data estimation makes it possible to highlight the heterogeneity of the observations in their individual dimensions by the taking into account of a fixed or random specific effect. Three tests make it possible to validate the specification of the model. The first is the test of presence of an individual effect, which consists in checking the existence of an individual effect. The second is the test of homogeneity of the coefficients that makes it possible to test the equality for all the companies and the third test is the test of Haussman, which is used to discriminate the fixed effect and the random effect.

For the three regression models, Fisher's test is significant at 1% level, which validates the significance of the individual effects. Similarly, Hausman test, which confirms the exogeneity of the specific effect in comparison with the explanatory variables, accepts this hypothesis. In this case, we will apply the random effect specification that ensures the taking into account of random heterogeneity and at the same time using both dimensions related to our company-year observations, namely, the individual and temporal variability. The variables used in our regression models are broadly significant for our sample. The Wald chi2 statistic of the test of overall significance of the model variables is significant at 1% level.

RESULTS

The meaning of the various variables and the results are presented in the following tables:

TABLE 4

Firm Performance and Cost Liquidity Measured by Relative Quoted Spread

	Return on equity	
Intercept	5.0707***	(2.83)
Relative quoted spread RQS(%)	0.3005**	(2.44)
GROW	0.0835	(1.51)
RISK	-0.1797	(-1.31)
TURN	0.1290*	(1.72)
SIZE	-0.2033**	(-2.22)
R^2	0.1925	

TABLE 5

Firm Performance and Cost Liquidity Measured by Relative Effective Spread

	Return on equity	
Intercept	5.4869***	(2.73)
Relative effective spread RES(%)	0.3453*	(1.82)
Taux de croissance du CA	0.0720	(1.31)

	Return on equity
Risk	-0.1784 (-1.29)
Turnover	0.1333* (1.65)
SIZE	-0.2206** (-2.18)
R^2	0.1806

TABLE 6
Firm Performance and Cost Liquidity Measured by Lambda

	Return on equity
Intercept	3.6713*** (2.15)
Lambda	0.0780 (1.06)
CA growth	0.0598 (1.09)
Risk	-0.2148* (-1.75)
Turnover	0.1594** (2.00)
SIZE	-0.1357* (-1.76)
R^2	0.1743

Performance in this study is measured by the rate of returns on equity at market value whereas liquidity is measured with three indicators: the relative quoted spread, the relative effective spread and Kyle's lambda.

As far as the relative quoted spread is concerned, we can say that results of the empirical test show that it is positively related to the returns on equity at market value. Similarly, relative effective spread seems to have a significant positive effect on the returns on equity at market value. These results confirm the hypothesis based on the theoretical evidence provided by Amihud and Mendelson (1988), according to which less liquid companies should suggest a higher profitability for investors (an illiquidity premium) so as to compensate the reduction of the transaction costs on the profitability of their portfolios. This premium is so adequate that liquidity risk cannot be eliminated by the investors. In other words, the rational investors have to bear the illiquidity cost of the company's securities at their market value. The market value of businesses, and consequently their performance at market value, includes an illiquidity premium. As a result, the actual performance of an investor must also take into account the frequency of the transactions carried out on the securities which even raises the transactional cost with the implicit transaction costs.

All the performed tests confirm the importance and significance of some control variables on performance. It should also be noted that the variables related to the firm's size and to the turnover are significantly correlated with the company's performance in the three regressions. The firm's size coefficient is negative and significant with a performance at the threshold of 5%, in tables 2.3, and 2.4 and of 10%, in table 2.5. This implies that the larger the firm, the lower its performance is. This result is consistent with that of Fang, Noe and Tice (2009) who, on the basis of 8290 business-year observations notice that small firms are generally more efficient than large ones. Similarly, this result confirms the hypothesis proposed by Ng, Yuce and Chen (2008), which states that large firms are considered less profitable because of their heavy organizations and their heavy cost structures. Regarding the rate of the portfolio turnover, we notice that it has a positive and significant effect on the rate of returns on equity at the market value. This result supports the argument stating that investors quickly react to any new information.

The coefficient reflecting the sensitiveness of the turnover growth rate to performance is positive but non-significant. This result contradicts our hypothesis stating that growth opportunities are value creators.

Finally, we can see that the variable relative to the volatility of securities prices negatively affects the returns on equity. This result is significant at 10% only in Table 2.5, which contradicts the hypothesis. The expected sign of this variable is consistent with the predictions of Spiegel and Wang (2005) who assume that securities with high specific risk have higher required returns.

CONCLUSION

The results confirm that the return on equity at market value is positively affected by the liquidity cost (illiquidity). It is clear that firms' performance partly includes the reduction of the liquidity implicit cost. The least liquid firms of the sample have a slightly higher performance. The test results indicate a negative and significant relationship between the firms' performance and their size. This result is consistent with that of Fang, Noe and Tice (2008) who found that small firms are generally more efficient than large ones. Inversely, the test results reveal a complete lack of significant relationship between the firms' performance and the rate of the turnover growth. Moreover, the observation of the results shows that the relationship between the volatility of the prices of securities and the return on equity is negative. The turnover rate influences positively and significantly the rate of returns on the shareholders' funds at market value. The results of this study reveal that the relationship between financial profitability at market value and the cost of liquidity is positive. In other words, firms' performance includes a liquidity premium which compensates the transaction costs borne by the investors in the market. The results are in compliance with those of the recent empirical studies of Drew, Veeraraghavan and Marsden (2006) and Amihud and Mendelson (2006) but there are not consistent with the findings of Alse et al. (2013).

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