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Full Length Research Paper

Stock exchange indices and turnover value-evidence from Tehran Stock Exchange

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This study provides a test of the price change-volume relationship. The relationship between price changes and volume in markets has been a topic of dispute among researchers in finance and economics for a number of years. The study investigates the empirical relationship between the stock exchange indices and turnover volume. Data gathered in time series form and variables have been determined from monthly reports of the Tehran stock exchange for the period from 2003 to 2009. The findings prove that there is positive relationship between exchange turnover value and stock exchange indices. An important but difficult part for further work in this area is to develop a theoretical understanding of markets that incorporates a lot of diverse agents, each of whom maximizes a multi period objective function subject to a stochastic environment. The joint distribution of price and volume could emerge in such a model.

Key words: Turnover value, indices, TEPIX, TEDIX, TEDPIX, Tehran stock exchange, Iran.

INTRODUCTION

International studies of markets in varying phases of development can help economists gain important insights into key institutional features that may encourage efficient outcomes (Foster and Kharazi, 2004). The Tehran Stock Exchange (TSE) has attracted attention for its high, internationally competitive returns and for suggestions of murky dealings and opaque regulations (Daragahi, 2004). The factors impacting favourably on the TSE's future prospects include Iran's strategic geographical location and its large population of over 75 million people, which makes it second only to Turkey in the Middle East. In addition, recent annual returns of over 40% have placed it in the forefront of exchanges in developing countries (Foster and Kharazi, 2007). In the Tehran stock exchange, the exchange's own practices sometimes encourage misbehaviour. The price of newly listed companies is not determined by the market, but by negotiations between the exchange and the company. And the exchange, wanting every initial public offering to be a success, insists on an artificially low price (Daragahi, 2004). Decreases in turnover of shares create concern among investors especially foreign investors. In theory, foreigners are allowed to buy shares on the bourse (TSE), but there is currently little foreign money in the market, reflecting both concerns over liquidity and transparency (Economist, 2007). Potential foreign investors, who have been able to make direct investments since 2003, should study the recent history of the Tehran Stock Exchange in order to understand the risks that accompany the high returns (Foster and Kharazi, 2007).In the Tehran stock exchange, in the absence of market makers, some listed companies have set up subsidiaries to buy and sell their own stock, helping to control their stock prices (Daragahi, 2004).

Haugen (2001) cited that if the market is efficient, today's stock price should already reflect all the information about future earnings and dividends that is both relevant to the valuation of the stock and "knowable." By knowable we mean all information that has been announced and can be predicted based on past announcements. The only information not reflected in the stock price is that which has not been received and cannot be predicted. This kind of information, by its very nature, must come into the market in an unpredictable, random fashion. As the market price responds instantly and accurately to its receipt, the price itself changes in a random, unpredictable fashion over time.

In an efficient market, security prices should respond

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instantly and accurately to the receipt of new information. Although there have been many studies of the response of stock prices to events such as stock splits, dividend announcements, takeover bids, block purchases and sales and corporate earnings reports, no empirical survey has yet been conducted to find the relationship between risk price and turnover in stock markets. Some of these studies have indicated that stock prices do, in fact, respond quickly and accurately to the receipt of new information. There has been convincing contradictory evidence reported, however. Strong studies of the response of stock prices to quarterly earnings reports indicate there is a lag of several months in the response of stock prices to earnings reports. The magnitude of the continuing response after the report is large enough to overcome the costs of transacting to take advantage of the lag (Haugen, 2001).

The price changes and volume relationship in markets has been a topic of dispute among researchers in finance and economics for a number of years (Smirlock and Starks, 1985). Several studies have attempted to depict and clarify this relationship (Copeland, 1976; Cornell, 2000; Crouch, 1970; Epps, 1975; Granger and Morgenstern, 1963; Granger and Morgenstern, 1970; Harris, 1983; Jennings et al., 1981; Karpoff, 1987; Tauchen and Pitts, 1983). Commencement with Osborne (1959), this relationship has been studied from a diversity of perspectives. For instance, preceding empirical investigations have incorporated the relationship between price indices and aggregate exchange volume (Granger and Morgenstern, 1963), between price change and volume (Westerfield, 2009; Tauchen and Pitts, 1983), between contemporaneous absolute price change and volume (Crouch, 1970; Rogalski, 1978), between squared price change and volume (Clark, 1973; Harris, 1983) and between the variance of price change and volume (Epps and Epps, 1976), but the controversy surrounding the form of this relationship still has not been determined (Smirlock and Starks, 1988).

According to Karpoff (1987) there are four reasons why the price-volume relationship is important. First, it provides insight into the structure of financial markets. Empirical relations between prices and volume can help discriminate between differing hypotheses about market structure. Second, the price-volume relation is essential for event studies that use a combination of price and volume data from which to draw inferences. If price changes and volume are jointly determined, incorporating the price-volume relation will increase the power of these tests. Third, the price-volume relation is critical to the debate over the empirical distribution of speculative prices. When sampled over fixed calendar intervals (e.g., days), rates of return appear kurtotic compared to the normal distribution. It appears price data are generated by a conditional stochastic process with a changing variance parameter that can be proxied by volume. Knowledge of the price-volume relation can then be used in event studies to measure changes in the variance of the price process from nonevent to event time. Fourth, price-volume relations have significant implications for research into futures markets. Price variability affects the volume of trade in futures contracts (Cornell, 2000; Martell and Wolf, 1987). The price-volume relation can also indicate the importance of private versus public information in determining investors' demands (Pfleiderer, 1984). Due to the contrary results, also lack of investigation in emerging countries, some researchers for instant Smirlock and Starks (1985) suggested further investigation of the stock price and volume relationship.

In this study, the relationship between turnover value and the market indices will be examined in the Tehran stock exchange. The purpose is to analyze the effects of market indices on turnover value and to find out significant relationship between turnover value and the market indices.

MAIN INDICES

Indices are important for several reasons. First, stock indices measure the general economy performance. It is unusual a stock market is rising sharply if the economy is in a recession. Interestingly, stock indices measure investors' expectations regarding the future performance of the economy, while statistics like the GDP measure the past performance. Second, indices are useful as a benchmark for gauging the performance of investment managers. Furthermore, stock mutual fund managers are typically evaluated against some index, such as the S and P 500. Third, indices serve as a guide for passively managed mutual funds. That is, an investor who wanted to match the performance of the DJIA could invest in a mutual fund that mimics the DJIA. Fourth, indices are used by investment analysts to assess the overall direction of the market. Fifth, indices are used to estimate statistical parameters such as market beta. Finally, indices are used as underlying securities in various derivative securities like futures and options (Levy and post, 2005).

Normally various indices differ in three major aspects: (1) which securities are included in the index, and how many, (2) how the index is adjusted over time for changes in securities (such as take-overs and mergers), and (3) which method is used to calculate the index (Levy and post, 2005). Indices can generally be categorised as price-weighted, value-weighted or equally weighted indices. The difference depends on how much significance or weight, is given to each security. The price-weighted index weighs its component securities according to their market price, whereas the value-weighted index weighs its component securities by their equity market value. The equally weighted indices weight each security equally (Levy and post, 2005). There are several indices in Tehran stock exchange. All indices have been adjusted for the free-float figures of all companies (Davani, 2004; TSE-Corporation, 2006). The main indices

are as follows.

TSE All share price index (TEPIX)

In 1990, the All-Share Price Index (TEPIX) was introduced to the market as the main indicator of share price movements. TEPIX is a weighted market value of all share prices appearing on the TSE Board and is measured every two minutes.

TSE Dividend and price index (TEDPIX)

In March 1998, an index was introduced to measure the rate of return on shares listed on the TSE. This includes the TSE Total Dividend and Price Index (TEDPIX) relating to gains both in price and in terms of cash payouts in the form of dividends. The TEDPIX calculates the rate of return in terms of both the share price and cash dividend payments, TEDPIX shows the real trend of the market, since the decline of companies' share prices due to holding their general assemblies does not have a negative impact.

TSE Dividend index (TEDIX)

In March 1998, another index was introduced to measure the rate of return on shares listed on the TSE without a specific sector classification which was the TSE Dividend Index (TEDIX). The TEDIX is only influenced by any declaration of dividends by companies after their annual shareholders meeting.

LITERATURE REVIEW

Most of researches in this area have attempted to theoretically, model and/or empirically determine a contemporaneous relationship between the price change and volume (Smirlock and Starks, 1988). One of the central findings of the literature is a positive relationship between the absolute value of price change and transaction volume (Smirlock and Starks, 1985). Smirlock and Starks (1988) found that average firm behavior indicates a significant lagged relationship between price change and volume and that this relationship tends to be more significant in short periods immediately preceding and immediately following quarterly earnings announcement. These results indicate that information arrival to investors tends to follow a sequential rather than simultaneous process. Even Karpoff (1987) believed that most theoretical models are unable to explain price-volume relations, Epps (1975) have attempted to describe and explain this relationship. Epps' model assumes that both the price change and volume are caused by the arrival of new information (Epps, 1975).

Smirlock and Starks (1988) used causality tests to examine the stock price-volume relationship and found no causality relationship. Rogalski (1978) used same methodology with Smirlock and Starks (1988) and found that stock price changes and the level of volume contemporaneously cause each other. Osborne (1959) attempted to model the stock price change as a diffusion process with variance dependent on the number of transactions and imply a positive correlation between volume and price change. Using spectral analysis of weekly data from 1939 - 1961, Granger and Morgenstern (1963) could discern no relation between movements in a Securities and Exchange Commission composite price index and the aggregate level of volume on the New York Stock Exchange.

Ying (1966) found that volume and price change are positively correlated, and a large increase in volume is usually accompanied by either a large rise in price or a large fall in price. Ying was the first to document both price-volume correlations in the same data set (Karpoff, 1987). As Haugen (2001) pointed out an efficient market exhibits certain behavioral traits or characteristics. The behavior of the real market examines to see if it conforms to these characteristics. If it doesnot, the market is inefficient. If the market is efficient, it should exhibit the following characteristics:

1. Security prices should respond quickly and accurately to the receipt of new information that is relevant to valuation.
2. The changes in expected security returns from one period to the next should be related to changes in the level of the risk premium associated with the security. Returns associated with factors other than these should be unpredictable.

As Haugen mentioned above, changing of stock prices is very important in the investigation of financial behaviour. On the other hand, investors look for liquid stock exchange with high stock turnover. According to these two important factors, in this research, the relationship between turnover value and the market indices was investigated. This is an area in which little research has been done to explore their relationship. This study is aimed at finding relationship between share turnovers and the indices in stock exchange markets. Some papers examined the relationship of volume to stock returns, suggesting that volume is important in distinguishing the autocorrelations (Foster and Kharazi, 2007). Using Iranian data, Foster and Kharazi (2007) applied the short-term portfolio composition strategies suggested by Conrad et al. (1994), Cooper (1999) and Gervais et al. (2001) and the medium-term strategy of Jegadeesh and Titman (1993). Although recent research found that US markets showed anomalous "contrarian" behaviour however the same tests applied to the Tehran Stock Exchange data show no significant contrarian effects. This finding, of no relation between volume and stock

return autocorrelation, is the opposite of previous studies of other developing markets.

Amuzegar (2005) stated that of a much greater significance among the TSE shortcomings is its insufficient liquidity. There are as yet no professional market makers, and all orders must be individually matched – causing lengthy delays in orders' execution. Rasoolizadeh and Solgi (2005) presented a statistical analysis of Tehran Price Index (TEPIX) for the period of 1992 to 2004. The results present asymmetric property of the return distribution. A strong autocorrelation has been detected in the TEPIX time series representing a long memory of several trading days. This paper gives a brief description about the economic behaviour of financial data in Iran stock market and its similarities and differences with other financial markets. Generally, academics and practitioners agree on the effects on security prices of changes in the most important factors. For example, almost all agree that when the Federal Reserve cuts interest rates more than expected, or when it announces no increase in the interest rate when such an increase is expected, then the overall stock market will go up. Similarly, investors routinely observe that when a firm announces greater-than-expected quarterly earnings and dividends, the stock price of the firm goes up. Note that the factor must change by more than expected to influence prices. What if the Federal Reserve does not cut the interest rate or the cut is less than what investors expected? In either case, the market will be disappointed and prices will fall as a result. Thus, an investor who correctly predicted a rate cut may still end up making money (Levy and post, 2005).

Campbell and Mei (1993) cited that the finding that a large part of the systematic risk of share prices comes from stochastic discount factors is consistent with evidence for the domestic market. In another study Solnik (1974) pointed out that although stock prices of each country tend to move together, the international capital market seems to be sufficiently integrated and efficient to induce an international pricing of risk for common stocks. While these results are in favour of the International Asset Pricing Model, they indicate that more efforts should be devoted to the study of international market structure in order to determine the stochastic process followed by security prices across the world. The concepts of turnover and liquidity are important in stock exchanges, because a perfectly liquid market is one in which an investor can trade a very large amount without moving the price (Economist, 2000). Liquid market is important for shareholders confidence. If public confidence is damaged, the cost of capital for security issuers will increase and the liquidity for investors will fall, causing enormous loss for the whole economy (Levy and post, 2005). Infact, liquidity is another word for good turnover in the stock market, therefore talking about liquidity means pay attention to the turnover as well.

Levy and post (2005) suggested that investors generally seek an investment strategy that provides the highest possible expected return within the constraints of the desired liquidity. The role of the secondary market is to provide investors with liquidity for their investment, enabling them to move quickly, and without substantial loss in market value, from security to cash and from one security to another (Haugen, 2001). Differences in the liquidity of stock are also potentially important. In rebalancing their portfolios, traders must buy at the dealers' asked prices and they must sell at the dealers' bid prices. The bid-asked spread serves as part of the cost of trading. The expected impact of the trade on the price of the stock is also important. Buying a great deal of the stock raise the price above the current asked price in order to attract the number of shares you want. Individual stocks are characterized by widely differing liquidity. To keep the expected rates of return, net of trading costs, commensurate across different stocks of differing liquidity, stocks must have gross expected returns that reflect the cost of trading. Factors that determine and relative liquidity of a stock include its price per share, the volume of daily trading relative to total market capitalization (price per share times the total number of share outstanding), the bid-asked spread as a percentage of price, the amount of institutional ownership, and the like.

Crouch (1970) found positive correlations between the values of daily price changes and daily volumes for market indices. Grammatikos and Saunders (1986) found volume to be positively correlated with price variability as well. Several researchers (Comiskey et al., 1987; Copeland, 1976; Epps and Epps, 1976; Jennings et al., 1981) attempted to make clear and explain the volume-price correlation. Copeland (1976) has constructed a sequential arrival of information model based on the optimism and pessimism manner. With N traders, there will be K optimists, R pessimists, and N-K-R uninformed investors at any point in time before all investors become informed. For the reason that the short sales prohibition, volume generated by a pessimist is generally less than that generated by an optimist. Consequently the price change and trading volume when the next trader becomes informed depend upon (i) the previous pattern of who has been informed and (ii) whether the subsequent trader is an optimist or pessimist. Similarly, the volume after all traders become informed depends on the path by which the final equilibrium is reached.

In one structure of the Mixture of Distributions Hypothesis (MDH), Epps and Epps (1976) developed a model in which the variance of the price change on a single transaction is conditional upon the volume of that transaction. Transaction price changes are then mixtures of distributions with volume as the mixing variable. They proved that the ratio of volume to a positive price change (while bulls' demands increase) is greater than the absolute value of the ratio of volume to a negative price change (what time bears' demands decrease). Share trading in terms of the number of shares traded increased in 1994/2004 in Tehran Stock Exchange. However it decreased in terms of value and number of deals where

they decreased 2005/2006 by 45.5 and 9.6% respectively. In general, the stock market in 2005/06 shed value as it is manifested by the decline of its major stock price indices. The price index (TEPIX), declined by 21.9% at the end of 2005/2006.

In an efficient market, security prices should respond instantly and accurately to the receipt of new information. Although there have been many studies on the response of stock prices to events such as stock splits, dividend announcements, takeover bids, block purchases and sales, and corporate earnings reports, no empirical survey has yet been conducted to find the relationship between indices and turnover value in Tehran stock market. This research tries to provide a snapshot of current practices in Tehran stock exchange, and the perception of Iranian shareholders.

In an efficient market, for investments with the same expected return, an investor will prefer the investment with lowest risk (Clarkson, 1989). Therefore it is expected that turnover will decrease when risk of share price increase. However based on many studies the Tehran Stock Exchange is inefficient (Doremami, 1990; Fadaeinejad, 1994; Jahankhani and Pourebrahimi, 2003; Namazi, 2003; Namazi and Shoushtarian, 1996; Nasrolahi, 1992; Sinaei, 1994; Zariffard and Nazemi, 2005).

In Tehran stock exchange, the exchangers' own practices sometimes encourage misbehaviour. The price of newly listed companies is not determined by the market, but by negotiation between the exchange and the company. And the exchanger, wanting every initial public offering to be a success, insists on an artificially low price (Daragahi, 2004). So shareholders believe that increase of shares price is not unusual and they still continue to sell and buy.

In addition, recent annual returns of over 40% have placed it in the forefront of exchanges in developing countries (Foster and Kharazi, 2007), During the period of this research, return of TSE investments increased considerably and in 2003 reached to 131.4% which in that year gave the highest return for WFE's members. Therefore higher return increased the turnover and Iranian shareholders are convinced that they will not lose even in times of changing prices.

RESEARCH METHODOLOGY

In the Tehran stock exchange, in the absence of market makers, some listed companies have set up subsidiaries to buy and sell their own stock, helping to control their stock prices (Daragahi, 2004). Market liquidity is very important to Iranian shareholders. Although the level of liquidity in the market is far from satisfactory, increasing number of shares traded help shareholders to increase the liquidity in the market. In addition to companies, shareholders too try to increase market liquidity.

In the Tehran stock exchange, investors are limited. There is no possibility of using derivative securities and insurance instruments and instead they diversify their portfolio in the Tehran stock exchange to minimise risks. Consequently, portfolio diversification causes increase in turnover. These reasons prove that there is positive relationship between exchange market turnovers and indices. Based on the discussion of the relevant literature, hypotheses are developed. Having identified the variables and establishing the relationship between them through logical reasoning, this study is in a position to test the above relationship. A hypothesis is defined as a logically conjectured relationship between two or more variables expressed in the form of a testable statement (Sekaran, 2003). Based on the discussions above, this study examined the following hypotheses:

H_1: There is positive relationship between turnover value and All-Shares Price Index (TEPIX).

$$TV = b0 + b1(TEPIX) + e$$

H_2: There is positive relationship between turnover value and Dividend Index (TEDIX).

$$TV = b0 + b1(TEDIX) + e$$

H_3: There is negative relationship between turnover value and total dividend and Price Index (TEDPIX).

$$TV = b0 - b1(TEDPIX) + e$$

The data were gathered, in time series form. The monthly data extended from April 2003 to December 2009. The data were obtained from the Tehran Stock Exchange Economic Research Department. EVIEWS software package was used to analyze the data. As with many statistical measures, the longer the data set the more statistically significant the result. As a general rule, a data set that consists of a minimum of 20 data points (period) is a good starting point. Once an investment product's performance history goes past three years (36 months), the results become more meaningful (Travers, 2004).

Research variables

The dependent variable is turnover value. There are two kinds of turnover, namely, the number of traded shares and the value of traded shares in Iranian Rial. First, both of information was gathered, then the numbers of traded shares were excluded and only the value of traded shares in Iranian Rial was used. This is because the worth of the various shares (shares of different companies) is different from each other therefore the number of traded shares is not a suitable criterion in this examination. The independent variables are TEPIX index, TEDIX index and TEDPIX index. The formula of TEPIX, TEDPIX and TEDIX is as follow:

$$\text{TEPIX} = \frac{\sum_{i=1}^{n} p_{it} q_{it}}{D} \times Base\ Value$$

Where: $D = \sum_{i=1}^{n} p_{i0} q_{i0}$ Therefore:

$$TEPIX = \frac{\sum_{i=1}^{n} p_{it}\, q_{it}}{\sum_{i=1}^{n} p_{i0}\, q_{i0}} \cdot \text{BASE VALUE}$$

P= share price of company i at time t
q = Number of shares published by company i at time t
n = Number of companies

Table 1. Descriptive statistics.

Statistic	Turnover	TEPIX	TEDPIX	DTEDIX
Mean	7007.773	10591.39	30797.39	44.65727
Maximum	27515.00	13617.07	48646.91	294.5200
Minimum	1042.000	5936.640	13348.03	-30.88000
Std. Dev.	5398.291	1566.474	6497.869	67.55614
Skewness	2.064008	0.013538	0.329262	2.167781
Kurtosis	7.534783	3.328321	4.477352	7.400679
Observations	66	66	66	66
Jarque-Bera	103.4131	0.298451	7.194607	104.9484
Probability	0.000000	0.861375	0.027397	0.000000

$$TEDPIX = \frac{\sum_{i=1}^{n} p_{it} q_{it}}{RD} \cdot 100$$

P= share price of company i at time t
q = Number of shares published by company i at time t
n = Number of companies

$$RD = \sum_{i=1}^{n} p_{i0} q_{i0}$$

The formula of TEDPIX is same as TEPIX, and the adjusting way is different. TEDPIX adjust with following formula:

$$RD_{t+1} = \frac{\sum_{i=1}^{n} p_{it} q_{it} - \sum_{i=1}^{n} DIV_{it+1}}{\sum_{i=1}^{n} p_{it} q_{it}} \cdot RD_t + \frac{RD_t}{D_t} \cdot (D_{t+1} - D_t)$$

The formula of TEDIX is:

$$\text{TEDIX} = \frac{D}{RD}$$

Statistic measurement

The Ordinary Least Squares (OLS) regression method and the following model ARE used to test the research hypotheses:

TV = F (TEPIX, TEDIX and TEDPIX).

In this model, TV is turnover value in Iranian Rial, and TEPIX, TEDIX, and TEDPIX are Tehran Stock Exchange indices. Correlation was used with regression analysis. The statistical methods for testing the research hypotheses are regression meaningful test (F test), regression partial correlation coefficients meaningful test (t-test), and partial coefficients (R^2).

The t-test assesses whether the means of two groups are statistically different from each other. This analysis is appropriate whenever you want to compare the means of two groups. This test is used when both the two sample sizes are equal; it can be assumed that the two distributions have the same variance. The t statistic calculates as follows:

$$t = \frac{\bar{X}_1 - \bar{X}_2}{S_{X_1 X_2} \cdot \sqrt{\frac{2}{n}}}$$

The F-test is used to test for differences among sample variance. The hypothesis that a data set in a regression analysis follows the simpler of two proposed linear models that are nested within each other. The formula for F is

$$F = \frac{S_1^2}{S_2^2}$$

R^2 is the square of the sample correlation coefficient between the outcomes and their predicted values. In the simple linear regression, R^2 is the square of the sample correlation coefficient between the outcome and the values being used for prediction. In such cases, the values vary from 0 to 1. R^2 is equivalent to

$$R^2 = 1 - \frac{SS_{err}}{SS_{tot}}$$

Variable numbers determined from different monthly reports of Tehran Stock Exchange, between years 2003-2009. The findings of these analyses are explained in the following section.

FINDINGS

Data include turnover value, the price index (TEPIX), the total dividend and price index (TEDPIX) and the dividend index (TEDIX) was tested. The descriptive statistics are shown in Table 1. The Jarque-Bera (JB) has an asymptotic chi-square distribution with two degrees of freedom and can be used to test the null hypothesis that the data are from a normal distribution. The null hypothesis is a joint hypothesis of both the skewness and excess kurtosis being 0, since samples from a normal distribution have an expected skewness of 0 and an expected excess kurtosis of 0. As the definition of Jarque-Bera shows, any deviation from this increases the JB statistic. Jarque–Bera is defined as

$$JB = \frac{n}{6}\left(S^2 + \frac{1}{4}K^2\right)$$

Kurtosis is a measure of the peakedness of the probability distribution of a real-valued random variable. Higher kurtosis means more of the variance is the result

Table 2. The results of regression model with three variables.

Variable	Coefficient	Std. error	t-Statistic	Prob.
TEPIX	0.738572	0.404794	1.824565	0.0729
TEDPIX	0.357869	0.149943	2.386709	0.0201
TEDIX	6.255345	10.46019	0.598014	0.5520
C	-12115.52	4042.550	-2.997000	0.0039
R^2		0.363442	Mean dependent var	7007.773
Adj. R^2		0.332641	S.D. dependent var	5398.291
S.E. of regression		4409.973	Akaike info criterion	19.67982
Sum of residual^2		1.21E+09	Schwarz criterion	19.81252
Log likelihood		-645.4339	Hannan-Quinn criter.	19.73226
F-statistic		11.79963	Durbin-Watson stat	1.671144
Prob (F-statistic)		0.000003		

Dependent Variable: Turnover, Method: least squares, Sample (adjusted): 2003M05 2008M10, included observations: 66 after adjustments, White heteroskedasticity-consistent standard errors and covariance.

Table 3. The results of regression model with two variables.

Variable	Coefficient	Std. error	t-Statistic	Prob.
TEPIX	0.685295	0.398514	1.719629	0.0895
TEDPIX	0.598884	0.295375	2.027535	0.0460
C	-18256.85	8338.147	-2.189558	0.0315
R^2		0.238615	Mean dependent var	8072.259
Adjusted R^2		0.219092	S.D. dependent var	10551.78
S.E. of regression		9324.503	Akaike info criterion	21.15501
Sum of residual^2		6.78E+09	Schwarz criterion	21.24370
Log likelihood		-853.7780	Hannan-Quinn criter.	21.19059
F-statistic		12.22244	Durbin-Watson stat	2.244704
Prob(F-statistic)		0.000024		

Dependent variable: turnover, Method: least squares, Sample (adjusted): 2003M04 2009M12
Included observations: 81 after adjustments, White heteroskedasticity-consistent standard errors and covariance.

of infrequent extreme deviations. Also skewness is a measure of the asymmetry of the probability distribution of a real-valued random variable. Using the Jarque–Bera test, the hypothesis of having normal distribution are rejected for TEDPIX (7.194607) with p-value equal to 0.027397 and TEDIX (104.9484) with p-value equal to

0.000000 and is not rejected for TEPIX (0.298451) with p-value equal to 0.861375, which is usual in the presence of excess for both kurtosis and skewness. Using the ordinary least squares (OLS) method, the regression model was run two times, with two variables and with three variables. Table 2 shows the results of regression model with three variables.

Based on the results of Table 2, the p-value (Prob) of TEDIX was equal to 0.5520 thus was not significant and the above model does not fit. Therefore, the model was run with two independent variables. Table 3 shows the results of regression model with three variables as final model. The assumptions of the ordinary least squares regression include stationarity of variables, normality, autocorrelation, heteroskedasticity, multicollinearity was tested as follows.

First, the stationarity or non-stationarity for the variables was investigated. The stationary of model was examined by applying Dickey-Fuller test (ADF) (Dickey and Fuller, 1979, 1981) and found out that time series data are stationary. An augmented Dickey-Fuller test (ADF) is a test for a unit root in a time series sample and to accommodate some forms of serial correlation (Greene, 2003). The results of ADF test indicate that all variables in level were stationary, except the dividend index (TEDIX). TEDIX index becomes stationary once the first difference of variable is applied. The results of Unit Root Test are shown in Table 4. The normality assumption was tested and the results showed that the normality is met. Results of Jarque-Bera test to identify

Table 4. Unit root test.

Variable	Augmented Dickey Fuller			
	Level		First difference	
	t-Stat	P-value	t-Stat	P-value
Turnover	8.335049	0.0001	-	-
TEPIX	3.696773	0.0283	-	-
TEDPIX	3.891964	0.0169	-	-
TEDIX	0.824111	0.9997	9.235746	0.0001

Critical value of t-test statistic at 5% of significance is equal to -3.46.

Table 5. Multicollinearity test.

	TEPIX	TEDPIX
TEPIX	1.000000	0.513386
TEDPIX	0.513386	1.000000

normality of residual distribution, shows that the model is asymptotically normal. With white Heteroskedasticity-Consistent Standard Errors and Covariance, the heteroskedasticity was controlled.

After that Durbin-Watson statistic test (D.W) was tested. Durbin-Watson statistic was used that quantifies the serial correlation of the errors in time series analysis. D-W takes values within (0, 4). For no serial correlation, a value close to 2 is expected. The Durbin–Watson statistic is calculated with:

$$d = \frac{\sum_{t=2}^{T}(e_t - e_{t-1})^2}{\sum_{t=1}^{T} e_t^2}.$$

In the result, the Durbin-Watson stat is equal to 2.244704 and is acceptable and quantifies that the serial correlation of the errors in time series analysis is not exist. Multicollinearity is a statistical phenomenon in which two or more predictor variables in a multiple regression model are highly correlated. In this situation the coefficient estimates may change erratically in response to small changes in the model or the data. Multicollinearity does not reduce the predictive power or reliability of the model as a whole; it only affects calculations regarding individual predictors. In terms of the Multicollinearity problem, the correlation coefficient between two variables is not that high (51%) to make the unbiased results. The results of multicollinearity test are shown in Table 5.

According to the results, multicollinearity is not serious. F-statistic is equal to 12.22244 with Prob (F-statistic) equal to 0.000024 which shows that the model is fit. Also R^2 (R-squared) is used which is the square of the correlation coefficient. When calculating this statistic, it was compared the turnover value (as the dependent variable) to an appropriate benchmark, in this case the market indices (as the independent variables). The R^2 statistic can be interpreted as the proportion of variance in the dependent variable attributable to the variation in the independent variable (Travers, 2004). The R^2 is 0.238615 which means the variance of market indices has attribute 23% to the variation in the turnover value. This percentage is quite acceptable. Based on the final model following equation was estimated.

Turnover = -18256.85 + 0.685295 TEPIX + 0.598884TEDPIX

The final model shows there is positive relationship between turnover value and all share price index (TEPIX), therefore the first hypothesis is accepted (P-value = 0.0895). As the model shows there is positive relationship between turnover value and total dividend and price index (TEDPIX), therefore the third hypothesis is accepted(P-value = 0.0460). The model with three variables shows there is no relationship between turnover value and dividend index (TEDIX), therefore the second hypothesis is rejected(P-value = 0.5520).

Conclusion

The purpose of this research is to provide an overview of current practices in the Tehran stock exchange and the perception of Iranian shareholders. Liquidity of market is very important for Iranian shareholders. Although the level of liquidity of market is far from satisfactory, the increasing number of shares traded helped shareholders to increase the liquidity of the market. It seems that shareholders tried to increase market liquidity.

In the Tehran Stock Exchange, investors have limited choices. It is not possible to use derivative securities and insurance instruments. Therefore they have to diversify their portfolio in the Tehran Stock Exchange. The

diversification causes turnover increase by more stock buying and selling. The findings prove that there is positive relationship between exchange Market turnovers and market indices. Since there are limited investigations about the factors that affected turnover value in stock markets, supplementary studies in this area are required and very necessary. Further research can be done to explore the nature and modality of turnovers and factors that involve these important variables. In stock markets with fluctuating prices, sufficient stock turnover is crucial, and in the absence of an adequate amount of turnovers, shareholders confidence which is one of the most valuable asset of capital markets, will be lost.

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