© 2013,
Science-Line Publication
www.science-line.com

ISSN: 2322-4770
Journal of Educational and Management Studies
J. Educ. Manage. Stud., 3(3):235-238, 2013

JEMS

Studying the Effect of Exchange Rate Fluctuations (USD) on Stock Returns of the Manufacturing Companies listed in Tehran Stock Exchange

Mohammad Nasiri, DavoodKhodadai and Mohammad HosseinRanjbar
Islamic Azad University, Science and Research Branch, Hormozgan
* Corresponding author's Email: mn6499@yahoo.com

ABSTRACT: Given intense fluctuations of Iran currency value (Rial) in recent years, we decided to study the effect of exchange rate fluctuations (USD) on stock returns of Iranian manufacturing companies. In this regard, the sample was selected from manufacturing companies listed in Tehran Stock Exchange from which 123 companies were selected. This study was conducted in three time intervals: no time interval, 12 weeks interval, 24 weeks interval. Based on the results of statistical tests of exchange rate fluctuations, 34% of changes in stock price returns were shown in the case of no time interval, 44% of changes in stock price returns were shown in the case of 12 weeks interval and 29% of changes in stock price returns were shown in the case of 24 weeks interval.
Keywords: Exchange Currency, Stock Returns, Time Interval, Arbitrage, Exchange Rate

ORIGINAL ARTICLE

INTRODUCTION

Over past few years, different researches conducted studies on effect of currency exchange fluctuation on stock returns. However, they did not find any relationship between these two issues or their results showed poor effect of currency exchange fluctuation on stock returns. In this research, we examined this issue in Iran. Iran has different economic characteristics such as very high inflation and very high exchange rates fluctuations. We wanted to see whether exchange rate fluctuations have any effect on stock price returns of the manufacturing companies listed in Tehran Stock Exchange or not or whether the exchange rate fluctuations highly affect stock price returns of manufacturing companies listed in Tehran Stock Exchange. In this scientific research, exchange rate fluctuations were considered as independent variable while stock price returns of manufacturing companies listed in Tehran Stock Exchange was considered as dependent variable. Besides these two variables, the price of heavy oil of Iran and Tehran Stock Exchange general index were entered in the model as control variables.

It should be noted that exchange rate fluctuations could not only have an immediate impact on stock price returns, but it also can affect stock price returns after several time intervals, for example 12 weeks interval or 24 time interval. Therefore, we investigated the effect of exchange rate fluctuations on stock returns in 12 weeks interval as wells as 24 time interval. The results of this investigation were interesting.

Based on similar studies conducted by Bakuf Amyhud in America, it was concluded that there is a direct relationship between the exchange rate and returns of the manufacturing companies (mentioned by Bayat, 2006). However, the difference between these two variables was not significant. With a six-month lag, it was seen that the relationship between exchange rates and firm value is significant. HesinFeng and Jane Lu during in their studies in America in 1994 concluded that the relationship between common stock returns and unanticipated changes in exchange rate is significant. Moreover, there was an indirect relationship between industries with high imports (exports) and exchange rate fluctuations (mentioned by Bayat, 2006). Calculated coefficients for currency exchange rate were significant. This shows that exchange rate risk is priced in the market. Ali Barto and Gordon evaluated the relationship between firm value, expected profit and changes in exchange rates in America in 1994. They concluded that there is no significant relationship between exchange rate and abnormal returns from common stock. However, with a time lag, it was seen that the correlation coefficient between exchange rates and firm value is obtained higher than it is expected. They also found out that there is a significant relationship between exchange rate changes and systematic errors in predicting profits of the companies (mentioned by Bayat, 2006). Jangmu Choi and Anita Prasad conducted a study in America in 1995 and concluded that there is a significant relationship between exchange rate and multinationals corporate value. However, this relationship is only significant for 15% of the companies. On the other hand, there is no significant relationship between exchange rates and portfolio returns of different industries (mentioned by Bayat, 2006). Moreover, there is a relationship between exchange rate and sales as well as assets and external profits of multinational companies; however, this

To cite this paper: Nasiri, M. Khodadai D. and Ranjbar M. 2013. Studying the Effect of Exchange Rate Fluctuations (USD) on Stock Returns of the Manufacturing Companies listed in Tehran Stock Exchange. *J. Educ. Manage. Stud.,* 3(3): 235-238.

relationship is not significant. George Alice conducted a study in America in 1996 and concluded that there is no significant relationship between exchange rates and the value of companies which were active in the electronics industry and had the highest exports in America. Companies with higher export ratio had higher exchange rate fluctuation coefficient. Moreover, it was shown that after a time lag, fluctuation increases. Edward Chow, Whine Lee and Michelle Salt conducted a study in 1997 and concluded that there is no significant relationship between exchange rate and the value of multi-national companies. The relationship between exchange rates and firm value increases by increasing time horizon. The correlation coefficient between the exchange rate and firm value decreases by increasing the firm size. AllahBakhsh (1996) conducted a study in Iran and concluded that the correlation coefficient between exchange rate changes and stock returns is positive; however, the reality contradicts this result. GhalibafAsl (2002) conducted a study and found the fact that there is a direct relationship between exchange rate changes and stock returns in six months interval in Iran. Besides, the relationship between exchange rate changes and stock returns in exporting firms is stronger than non-exporting companies.

Due to intense global pressure and sanctions on Iran's economy and intense currency exchange rate fluctuations in our country, it is important to investigate the impact of Iran's money value fluctuations on stock returns of the manufacturing companies listed in Tehran Stock Exchange. Therefore, exact amount of this influence can be calculated scientifically and reasonably. On the other hand, financial managers and economic policy makers as well as other investors can access these results, so that they can make better decisions about financial, economic and investment issues.

MATERIALS AND METHODS

In this study, we used panel data regression analysis and least squares method to test hypotheses. Several statistical tests were used in this study that search brief description is given in this section. In the next section, we describe the results of these tests.

1- Dickey Fuller test: Given that the present study used least squares method, the reliability of sample patterns' variables should be measured. In order to measure this reliability, Dickey Fuller test was used.

2- Limerick F test (Chow): in order to estimate the model, first Limerick F test is used in order to determine whether the panel data model should be used or integrated data model should be used. The statistic of this test is as follows:

$$F_{N-1,NT,N-K} \cong \frac{(RRSS - URSS)/N - 1}{URSS/\ NT - N - K}$$

$$\begin{cases} H_0: \alpha_1 = \alpha_2 = \ldots = \alpha_n \\ H_1: \alpha_i \neq \alpha_j i=j \end{cases}$$

3- Hausman test: If panel data method was selected based on F Limerick test, then following question will raise: whether the difference in the intercept of sectional units acts constantly or random functions can express the difference between the units more clearly. The methods used to answer these questions are called fixed effects and random effects respectively. To diagnose the issue mentioned above, Hausman test is used.

4- F Test: F test was used in order to investigate whether the regression model is linear or not and whether the regression model is significant or not. Null hypothesis of F test expresses that regression model is non- linear and insignificant.

5- T Test: the coefficients of all hypotheses models are estimated based on fixed effects. To evaluate the significance of estimated coefficients, T test is used. Null hypothesis of T test expresses that model's coefficients are equal to zero.

6- Watson Durbin statistic: Watson Durbin statistic determines whether there is autocorrelation within error terms or not. If the level of errors was located within acceptable range (between 1.5 and 2.5), this indicates that error terms are independent from each other. Then, these terms will not interfere with the model.

7- Serial Correlation Test: Serial correlation refers to the situation where error terms are correlated over time in the regression model. To detect serial correlation, serial correlation method in Pagan method is used. Null hypothesis of serial correlation test expresses that there is no correlation between error components of the model over time and there is no serial correlation problem in the model.

8- Variance Hetero scedasticity Test: Once in a regression model, error components (error) were not the same in cross-sectional units (firms) over time, it is concluded that there is variance hetero scedasticity in the model. White variance hetero scedasticity test is used to detect variance hetero scedasticity. Null hypothesis of variance hetero scedasticity test expresses that the variance of error components of all sectional units are identical and constant and there is no variance hetero scedasticity in the model.

9- Normality test of error components: this hypothesis expresses that mean error values are equal to zero. According to this hypothesis, residue mean value with respect to given X_1 is equal to zero. Each Y set related to given x is distributed around

mean value of Y set. In this distribution, some values of Y are distributed above mean and other values are distributed below mean. Distances below and above mean values are U_1 whose mean is zero. JB test is used in order to test normality of error components.

Statistical population of the research included all manufacturing firms listed in Tehran stock exchange except investment companies, banks, insurance companies and other transportation and non-manufacturing companies. They listed in Tehran Stock Exchange from 2007 until the end of December 2012.

The samples of the research consisted of companies that had all following conditions:

1. They should not be among financial companies (such as banks, insurance companies) and investment companies and other non-manufacturing companies.
2. They should have listed in Tehran Stock Exchange from 2007 until the end of December 2012.
3. Required information related to them should be available.

Among these companies, 123 companies listed in Tehran Exchange Stock were selected through a lottery and they were used to test each three hypotheses.

RESULTS

1- All above-mentioned tests were repeated in following three cases: without time interval, in 12 weeks interval, in 24 weeks interval. The results were the same. The analysis of all tests are provided in this section briefly:

2- Dickey Fuller test: based on the results of this test, stability of the variables in the model was proved at 5% [level of significance]. As a result, the estimation of research's hypotheses pattern is significant using conventional econometric techniques.

3- Limerick F test (Chow): based on the results shown in following table, the null hypothesis is rejected because significance level of all tests' hypotheses is less than 0.05. Then, using panel data approach is more appropriate.

4- Hausman test: based on the results shown in table 1, the null hypothesis is rejected because significance level of all tests' hypotheses is less than 0.05. Thus, the fixed effects method is used to estimate the model.

5- F Test: according to results of table 1, null hypothesis of F test is rejected at 95% confidence level (5% error level) because F-Probe statistic value (probability of null hypothesis acceptance) is equal to zero and it is less than α significance level under study (α significance level = 0.05). Therefore, the model is significant and there is a linear relationship between dependent and independent variables.

6- T Test: according to results of table 1, null hypothesis of T test is rejected at 95% confidence level (5% error level) because F-probe statistic value (probability of null hypothesis acceptance) related to FX (dependent variable) is less than α significance level under study (α significance level = 0.05). Thus, the coefficients are significant; moreover, they are not zero.

7- Watson Durbin statistic: Watson Durbin statistic value is located within acceptable level (between 1.5 and 2.5) for all models' hypotheses. Therefore, there is no autocorrelation in error terms. This indicates that error terms are independent from each other and they do not interfere with the model.

8- Serial correlation test: according to results of table 1, null hypothesis of serial correlation test is accepted at 95% confidence level (5% error level) because F-probe statistic value (probability of null hypothesis acceptance) is higher than α significance level (α significance level = 0.05). Thus, in this model, there is no serial correlation problem.

9- Variance Hetero scedasticity Test: according to results of table 1, null hypothesis of variance hetero scedasticity test is accepted at 95% confidence level (5% error level) because F-probe statistic value (probability of null hypothesis acceptance) is higher than α significance level (α significance level = 0.05). Thus, in this model, there is no variance hetero scedasticity problem.

10- Normality of error components: significance level of the test for all models is higher than 0.05, then null hypothesis is accepted and errors are normal.

Based on the tests conducted in this study - whose results are shown in table 2 exchange rate fluctuations has the highest effect on stock price returns in twelve-week interval. This intense effect is also seen in the cases of without time interval and 24 weeks interval; however, this effect is less than the effect seen in 12 weeks interval.

DISCUSSION

This study aims to investigate the impact of exchange rate fluctuations (USD) on stock returns of the manufacturing companies listed in Tehran Stock Exchange. The results of this study showed that the impact of exchange rate fluctuations on stock returns of most of the manufacturing companies is higher than the impact of manufacturing companies whose free float stock is more than 40 percent. Moreover, the impact of exchange rate fluctuations on stock returns of manufacturing companies with 40% free float stock is higher than the impact of manufacturing companies whose free float stock is less than 10 percent. On the other hand, the results of this study suggest that exchange rate fluctuations have an immediate effect

on stock returns; however, this effect is more visible with a time interval of three months or more than that. Off course, this effect is also visible for up to six months after it is first seen; however, it becomes less distinguishable over time. The results of this study are in line with results of Vafapur (2003), Haghighi (2009), Naini et al. (2003) and Sajadi et al. (2010).

Table 1. The analysis of all tests about study hypothesis

	Without time interval	12 weeks interval	24 weeks interval
Results	0.0000	0.001	0.0003
	Without time interval	12 weeks interval	24 weeks interval
results	0.000	0.0000	0.0000
	Without time interval	12 weeks interval	24 weeks interval
Results	0.000	0.000	0.0000
	Without time interval	12 weeks interval	24 weeks interval
Results	0.000	0.000	0.0000
	Without time interval	12 weeks interval	24 weeks interval
Results	1.81	1.97	1.8
	Without time interval	12 weeks interval	24 weeks interval
Results	1.21	0.20	0.18
	Without time interval	12 weeks interval	24 weeks interval
Results	0.11	0.32	0.2
	Without time interval	12 weeks interval	24 weeks interval
results	0.96	1.6	1.88

Table 2. Total results of all hypotheses of study

Variable	Without time interval	12 weeks interval	24 weeks interval
Effectiveness percentage of exchange rate fluctuations on stock price returns	34%	44%	29%

REFERENCES

AllahBakhsh, M. (1996). Studying the effect of exchange rate changes on stock price changes of companies listed in Tehran Stock Exchange. Master thesis of Accounting, Tehran University.

Bayat, M. (2006). Studying the effect of exchange rate changes on stock returns of different industries in Iran. Master Thesis of Financial Management, University of Al- Zahra.

Energy Database. (2002). Energy and Economics Consulting Company Shayegan. Available from: http:// www.energyseec.com.

GhalibafAsl. H. (2002). Financial Management (principles, concepts and applications).Tehran .Puran Pajoohesh.

Haghighi, M. (2009). International Commerce (Theories and Applications).Tehran. Institute of Tehran University Press.

Naini, A. GhalibafAsl H. (2003). The effect of exchange rate on stock returns in Iran. Journal of School of Management of University of Tehran, 5, 15.

Sajadi, H. Farazmand, H. Soofi, H. (2010). Studying the relationship between macro-economic variables and stock cash return index in Tehran Stock Exchange, Journal of Accounting and Auditing Research, No. 6

Tehran Securities Exchange Technology Management Company (Pvt). (2012). Financial Information Processing Center of Iran. Available from: http://www.fipiran.com.

Tehran Stock Exchange of Information. (2012). Tehran Securities Exchange Technology Management Company. Available from: http://www.tsetmc.com.

The world Energy Information. (2012). business, financial & economic news, stock quotes. Available from: http:// www.bloomberg.com.

Vafapur, S. (2003). Studying the relationship between changes in cash flow items and stock returns changes of companies listed in Tehran Stock Exchange. Master Thesis of Accounting. Tehran University, School of Management.