STUDYING RELATIONSHIP BETWEEN EXCHANGE RATE AND DIVIDEND (CASE STUDY: IRAN KHODRO COMPANY)

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Abstract
One of the characteristics of developed countries is the presence of efficient markets and financial institutions which cause development of these countries in addition to their important role in economy of these countries. Since share market value is affected by macroeconomic variables, the present research was conducted to determine long-term relationship between foreign currency variations and dividend of Iran Khodro Company and explanatory variables of oil price and consumer price index have been used as explanatory variables. In this research, data are studied every year for time period of 1991 to 2012. To study time series statics, augmented Dicky Fuller test has been used. Results of this test showed that variable of foreign currency was static in the level and other variables were static in the first order difference. In this research, relations between variables have been determined based on exchange rate fluctuations have been determined using Auto Regressive With Distributed Lags (ARDL) and results of this test indicate the presence of positive and significant relationship between exchange rate and dividend and between exchange rate and consumer price index and negative and significant relationship between exchange rate and oil price.

Keywords: exchange rate, oil price, consumer index, dividend, Iran Khodro Company

1. Introduction
One of the characteristics of continual movement toward sustainable economic development is to obtain necessary financial resources for economic activities by equipping saving resources in national economy. In recent decades, expansion of capital market in developing countries led to desirable economic growth. Developed countries believe that major part of developmental trend is due to financial markets and particularly stock exchange. Financial markets are indicative of economy of each country. Boom and stagnation of these markets not only affect national economy but also regional and global economy. Stock exchange as one of the main financial markets is place of saving and liquidity of private sector to finance investment projects on the one hand and formal and safe source in which stagnant savings can search for relatively suitable and safe place for investment and apply their money for investment in companies. It is evident that boom and stagnation of stock exchange can result from different factors in economy. In case this market has no logical relation with other sections, their performance will have difficulty and defect.

2. Problem Statement and Significance of the research
Investors should make investment with hope of achieving more wealth. One of the important factors which investors consider in their decision making is dividend. Dividend in investment is the impetus which creates motivation and is regarded as a reward for investors. In fact, any
investors should ensure that principal of investment will be returned in the first stage and then the
interest is acquired to decide about investment. Dividend is affected by different factors. One of
these factors can be exchange rate fluctuations. Theoretically, uncertainty of exchange rate
fluctuations affects local economic section particularly dividend in addition to foreign trade
section. In an open economy, services and capital are applied considering exchange rate.
Therefore, exchange rate can affect major variable of export, import, entry and exit of capitals. In
fact, it can be said that exchange rate fluctuations create a kind of risk in foreign interactions
section which can disrupt export, import and capital flows. Therefore, if exchange rate variations
are adjusted in proper direction, they can provide suitable and agreeable environment for
production, trade and investment, exchange rate fluctuations will change price of goods and
services, production and production factors and will affect cash flows and expected future flows
and consequently dividend of the economic agency. Hence, reduction of money value increases
demand for local goods due to increase of relative price of the foreign goods compared with the
local goods resulting in increased general level of prices. On the other hand, it reduces import of
the intermediary and capital data due to increase of their price leading to increase of production
cost and reduction of investment, reduction of demand for share and finally reduction of
dividend. Considering significance of the subject, share market acts as economic indices of the
country and increase of investment in this market and attraction of capitals to capital market
requires increase of dividend, reduction of risk and emergence of desirable conditions for
investment. Since macroeconomic variables such as exchange rate, inflation, oil price etc are
effective on dividend, clear long-run relationship between macroeconomic variable and dividend
can help managers and future investors make decision.

3. History of Research
Relationship between exchange rate and shares has been one of the controversial issues among
the researchers since a long time ago. For this reason, it has long history in this research. In this
Section, some of these studies which relate to the studied subject are reviewed.
Mohammad Barzandeh (1997) showed that role of variables of share price of Tehran Stock
Exchange, exchange rate, vehicle price index and house price index in variations of share price
index. Hassan Ghalibaf Asl (2002) showed that variations of exchange rate had negative effect on
stock return but variations of exchange rate with a time lag had positive effect on the stock return of Tehran stock exchange companies. Eslamion and Zare (2006) showed that exchange rate
had positive effect and money volume had negative effect on share price index in Tehran stock
exchange. Heidari (2001) showed Granger’s Bidirectional Causality relationship between index of
share price, exchange rate, automobile share price index and house price index in Iran. Mostafa
Karim Zadeh (2005) showed that there was a co-integration vector between stock exchange index
and monetary variables. Long-run relationship confirms significant positive effect of liquidity and
significant negative effect on exchange rate and bank interest rate on stock exchange index.
Barzani et al. (2009) found that market share value had direct relationship with expenditure of
government and money volume and reverse relationship with tax and exchange rate in long run.
Study of short-run relationship using vector error correction model also showed that short-run
fluctuations of variables were related to long-run equilibrium value. Najar Zadeh et al. (2009)
found that effect of exchange rate fluctuations increased share price in short and medium term and
of capital markets also could be effective in addition to macroeconomic variables. Walti (2005)
found that trade, financial merger, economic structure of countries, information dissymmetry and
Exchange Rate Policy are the factors which can be effective on behavior of share market.
Pen et al. (2007) found that there was significant relationship between exchange rate and share
price for Hong Kong, Japan, Malaysia and Thailand before financial crisis of 1997. There was
also relationship between share market and exchange rate market for Hong Kong, Korea and
Singapore. During financial crisis, no country shows significant relationship between share price
and exchange rate but there is relationship between exchange rate and share price for all of the studied countries except Malaysia. Morley (2009) in England, Japan and Switzerland showed that there was long-run relationship between exchange rate and share price for the said countries. Results of estimating error correction models suggest positive relationship between exchange rate and share price. Bir and Habin (2008) studied relationship between share price and exchange rate for two groups of developed countries and developing countries. Results showed that there were no stable fluctuations in share market in the developed countries while the mentioned fluctuations are stable in developing countries. Yan and Nieh (2009) studied effects of exchange rate of Taiwan compared with Japan, share price in Japan and Taiwan during 1991-2008 using threshold error correction model. Results of Granger Causality Test show that there is no short run relationship between two financial assets for both countries but they have asymmetric long-run relationship. Zhao (2010) in China showed that there was no stable long-run equilibrium relationship between real exchange rate and share price and the past changes in share market had larger effect on the future exchange rate fluctuations. There are also bidirectional spillover effects of fluctuations between two markets. The model used in this research has been used as main model for the research.

Alajideh et al. (2010) found that there was causal relationship between exchange rate and share price for Canada, Switzerland and England and there was causal relationship between share price and exchange rate for Switzerland. Sobari and Salehiv (2010) in Nigeria showed that exchange rate fluctuations had negative and significant effect on share price while interest rate and inflation rate had no long-run relationship with share market. Chitza (2011) in South Africa showed bidirectional relationship between macroeconomic variables and share price and also concluded that uncertainty of macroeconomic variables had significant effect on share market fluctuations.

4- Research Variables

The variables used in the research model are divided into three classes: dependent, independent and control.

4.1. Dependent variable
EPS: is dividend of Iran Khodro Company at time t. in capital market and in financial management term, EPS means the amount of interest which is obtained by dividing net profit by the number of published shares of company (public joint stock).

4.2. Independent Variables
GXE: Variations of exchange rate at time t.
OP: Oil price at time t. (oil price has been calculated in USD and is mean price of each barrel).
CPI: Consumer price index (CPI) at time t. Consumer price index is the average price of goods and services which a family purchases. In Iran, Laspeyres’ method is used for calculating consumer price index. In this method, base year consumer price index in current price should be divided by base year consumer price index and then multiplied by 100. In this case, variation of price in the base year is studied.

3.3. Control Variable
CAP is capital of company at time t. capital of joint stock company means sum of nominal price of its share. Therefore, the capital is divided into equal shares and each one of the partners will have one or more shares.

4. Research Model: in the model which relationship between dividend of Iran Khodro Company (as dependent variable) and independent variable of exchange rate variations along with independent variables of oil price, consumer price index (CPI) and capital of the company can be studied, Auto Regressive With Distributed Lags (ARDL) can analyze this model in the best manner. In addition, ARDL model as a dynamic equation with equilibrium solution can give suitable response for the raised questions about the discussed issue. Therefore, the research model is as follows:
5. **Research Hypotheses**

To achieve goals of the research, the following main hypotheses can be extracted:

1. Variations of exchange rate have significant effect on dividend of Iran Khodro Company.
2. Oil price has significant effect on dividend of Iran Khodro Company.
3. Consumer price index CPI has significant effect on dividend of Iran Khodro Company.

6. **Research Method**

This research is of applied type and is included in correlating studies. This research method is applied for conducting the studies which intend to investigate cause or causes of definite relationships which have occurred in the past and have been completed. This type of research method has relatively high validity because it seeks to achieve causal relation or cause and effect relation between factors of the research. Therefore, it is of Ex-post facto type. In these researches, variables cannot be manipulated by researcher or artificial or experimental conditions cannot be created by him for different reasons (Seyed Abbas Zadeh, 2001).

7. **Information Collection Methods**

Information used in this research can be divided into two classes. The first class includes information relating to theoretic fundamentals and literature which were provided by reviewing Iranian and Foreign papers and theses available in internet and local and foreign publications through library studies. The second class includes information and statistics necessary for estimating the model in which statistically reliable references (Central Bank of Islamic Republic of Iran, financial reports of the company from site of Tehran Stock Exchange Organization and Rahavard Novin Database Software) have been used.

8. **Statistical Population**

In this research, Iran Khodro Company was considered as statistical population and was studied in 22-year period from 1991 to 2012.

9. **Testing Hypotheses**

9.1. **Estimating Model Using ARDL Method**

We first select the maximum number of lags 2 to estimate the model based on at most 2 lags for each variable. In the next step, we should select one out of four criteria which include adjusted coefficient of determination, Akaike, Schwartz Bayesian and Hannan-Quinn criteria. Our selective criterion for estimating the model is Schwartz Bayesian (SBC). We used this criterion because it estimates coefficients with the least lag. In Auto Regressive With Distributed Lags(ARDL), we can use short-term model dynamics. In this Section, CUSUM and CUSUMSQ graphic tests are used for short-term model of residuals. These tests are graphically presented. Now, if plot of cumulative sum of recursive residuals is located inside area between two critical lines in level of 5% for CUSUM test, the long-run relationship will be stable and stability of the estimated coefficients is confirmed. But if cumulative sum of recursive residuals is located outside area between two critical lines in level of 5%, the long-run relations will be unstable. In other words, stability of the long-run relationship in different time periods will be jeopardized. It also holds true for CUSUMSQ and the only difference is that square of cumulative sum of recursive residuals is used in the test based on CUSUMSQ method.

9.2. **Studying Long-run relationship**

Angel-Granger Two-Steps Test (1978) has limited estimates bias in small samples, therefore, estimation of the model and test of hypotheses are invalid with helps of common statistics. Angel-Granger Two-Steps Test is based on premise of cointegration vector and when there is more than one cointegration vector, use of this method will not be efficient. To remove these limitations,
Auto Regressive with Distributed Lags (ARDL) has been presented by Pesaran and Shin (1998). This method is not sensitive to cumulative sum of explanatory variables and compatible estimate of the long-run coefficients of the model can be obtained by selecting the number of suitable lag in the model. The second method which has been presented by Pesaran, M.H. and et al. (1996) tests the presence of long-run relationship between the studied variables with F statistic of bounds test for testing significance of levels with lag of the variables in error correction form. The important point is that the above F distribution is not standard. Pesaran, M.H. and et al. have calculated suitable critical values corresponding to the number of repressor whether the model includes intercept and trend or not. They have presented two groups of critical values: one is based on the fact that all variables are stationary and another one is based on the fact that all are non-stationary (they have become stationary with one differencing. If computational F of the bounds test are out of this bound, definite decision will be made without need to know that variables are I(0) or I(1). If computational F of bounds test exceeds the upper bound, null hypothesis that there is no long-run relationship is not accepted and if it is below the lower bound, null hypothesis will not be rejected. If computational F of the bounds test is between two bounds, results of inference will be uncertain and dependent on whether variables are I(0) or I(1). Under these conditions, we have to perform unit root tests on the variables. \(^1\)

8.1. Estimating Long-run Equation:

Model estimation method is Auto Regressive With Distributed Lags (ARDL). To estimate the model with this method, it is necessary to determine the number of optimal lags of the variables. To determine optimal lags in the equations, Schwartz – Bayesian Criterion (SBC) has been used. Results of estimating long-run equations are given in Table 3.

8.1. Estimating Error Correction Model

To estimate this model, a long-run relation should be estimated and in case that it is not false, lagged residual coefficient of the long-run relation is regarded as error correction coefficient and the following relation is estimated:

\[
\Delta Y_t = a + b \Delta X_t + c U_{t-1} + e_t
\]

Error correction coefficient means estimation of \(c\) with negative mark which will indicate speed of error correction speed and tendency to long-run equilibrium. This coefficient shows that non-equilibrium of the dependent variable is adjusted and approaches the long-run relation (Tashkini, 2005).

10. Research Results

Table 1: Results of Short-run Estimation

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficients</th>
</tr>
</thead>
<tbody>
<tr>
<td>( EPS_t(-1) )</td>
<td>0.3925</td>
</tr>
<tr>
<td>( GXE_t )</td>
<td>0.0813</td>
</tr>
<tr>
<td>( OP_t )</td>
<td>-24.495</td>
</tr>
<tr>
<td>( OP_t(-1) )</td>
<td>-31.665</td>
</tr>
<tr>
<td>( CPI_t )</td>
<td>19.2224</td>
</tr>
<tr>
<td>( CAP_t )</td>
<td>-0.48132</td>
</tr>
<tr>
<td>Intercept</td>
<td>1492.8</td>
</tr>
<tr>
<td>( R^2 )</td>
<td>0.6637</td>
</tr>
</tbody>
</table>

\(^1\) Tashkini, 2005, P. 147-148
According to Table 1, all variables except capital of company have expected signs and are statistically significant in high confidence level. Coefficient of the main variable i.e. variations of exchange rate has been evaluated positive. In other words, increase of exchange rate has led to increase of dividend of Iran Khodro Company. Oil price has negative and significant effect on dividend of Iran Khodro Company. In other words, with increasing oil price, dividend of Iran Khodro Company has decreased. General level of prices has positive and significant effect on dividend of Iran Khodro Company because cash purchasing power has decreased with increasing general level of prices and inflation rate and people invest their money in durable goods (such as house, shares and bonds). Hence, dividend also increases with increasing demand of stock exchange. Variable coefficient of capital has been evaluated negative and significant indicating that increase of the company’s capital has reduced dividend of the company and sign of this coefficient was not expected.

In Table 2, results of bounds test are given. Therefore, it can be said that bounds test confirms cointegration relationship among the model variables in significance level of 5%. For this reason, the presence of long-run relationship among the variables cannot be rejected.

Table 2- Bounds test for studying long-run relationship

<table>
<thead>
<tr>
<th>F-statistic</th>
<th>Lower Bound</th>
<th>Upper Bound</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.4894</td>
<td>3.7983</td>
<td>90%</td>
</tr>
<tr>
<td>5.2592</td>
<td>2.9686</td>
<td>95%</td>
</tr>
</tbody>
</table>

According to Table 3, all variables except capital of company have expected signs in long-run model and are statistically significant. Coefficient of the main variable i.e. variations of exchange rate has been evaluated positive in long-run model. In other words, increase of exchange rate has led to increase of dividend of Iran Khodro Company. Oil price has negative
and significant effect on dividend of Iran Khodro Company. In other words, with increasing oil price, dividend of Iran Khodro Company has decreased. General level of prices has positive and significant effect on dividend of Iran Khodro Company because cash purchasing power has decreased with increasing general level of prices and inflation rate and people invest their money in durable goods (such as house, shares and bonds) for compensation. Hence, dividend also increases with increasing demand of stock exchange. Variable coefficient of capital has been evaluated negative and significant indicating that increase of the company’s capital has reduced dividend of the company and sign of this coefficient was not expected.

Considering confirmation of long-run relationship between economic variables in the model, short-run relationships between financial shocks and real consumption of the private sector have been estimated using error correction method (ECM) and results of estimation are given in Table 8-4:

Table 4- Results of estimating error correction method (ECM)

<table>
<thead>
<tr>
<th>Statistic t</th>
<th>Coefficient</th>
<th>Variable</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.7483</td>
<td>0.08135</td>
<td>$dGXE_t$</td>
</tr>
<tr>
<td>-2.4712</td>
<td>-24.495</td>
<td>$dOP_t$</td>
</tr>
<tr>
<td>2.7711</td>
<td>19.224</td>
<td>$dCPI_t$</td>
</tr>
<tr>
<td>-2.2852</td>
<td>-4.8132</td>
<td>$dCAP_t$</td>
</tr>
<tr>
<td>-3.3185</td>
<td>-0.6074</td>
<td>ecm(-1) error correction model</td>
</tr>
</tbody>
</table>

According to Table 4, short-run relationships among the variables are also confirmed and all coefficients are statistically significant. ecm(-1) coefficient indicating adjustment speed of non-equilibrium process is equal to -0.60, hence, 60% of the deviations of Households’ Consumption expenditure from long-run route in each period are adjusted in the next period and move toward their long-run equilibrium.

In Table 5, diagnostic tests of ARDL model are given. Based on results of this table, hypothesis of variance consistency among the error terms cannot be rejected considering high probability of statistic t, therefore, there is no heteroskedasticity among the error terms. Considering high probability of statistic t, hypothesis of lack of serial autocorrelation among error terms cannot be rejected, therefore, there is no serial autocorrelation among error terms.

| Table 5- (0,1,1,2,0,0) ARDL model diagnostic tests |
|---------|-----------------|-----------------|
| Statistic t | Probability t | Statistic t | Probability t |
| CHSQ      | 0.934           | 0.597          | 0.187 |
| F         | 2.111           | 2.9043         | 0.170 |

11. Conclusion
Using the obtained results, all three hypotheses were confirmed. To analyze direct relationship between variations of dividend exchange rate of Iran Khodro Company, it can be said that Iran Khodro Company has better competitive power in export with increasing exchange rate and is in better condition with increasing revenues from export of goods and services. In this case, demand for share of company increases with increasing exchange rate and improving revenue condition and finally dividend of the stocks of this company increases. In the estimated models with dependent variable of dividend which has been applied in the present research, increase of
general level of prices has positive effect on dividend of Iran Khodro Company. In other words, stock return of stock exchange companies averagely increases with increasing price indices (increase of inflation). This phenomenon can be justified such that cash purchasing power is reduced with increasing general level of prices and increasing inflation rate and people invest their money in durable goods (such as house, shares and bonds). In case of inflation, stockholder will adjust his expected return based on inflation rate. Therefore, the expected return of investor increases with increasing inflation rate. In the research model, oil price has significant effect on stock return. Considering major role of oil revenue in governmental costs, export and national income, oil sector plays dominating role in economy of Iran and has disrupted economic system of Iran. Considering that oil price is a political-economic variable and is beyond control of Iran, it creates motivational and positive effect on capital market of Iran following economic boom and consequently increase of oil price. Based on experiences of capital market fluctuations and the direct relationship with oil price, it seems reasonable to justify positive effect of oil price on stock return. As documented evidence, global crisis and stagnation 2009 led to considerable reduction of oil price and stock return of most companies. But as observed above, income fluctuations lack such certain and significant effect. It can be said that although oil price has significant effect on stock return, oil revenues lack such effect due to factor of oil production rate. In other words and based on the existing evidence particularly performance of the member states of OPEC, when global oil price increases, general decision is about reduction of oil production rate. In other words, effect of increased price is neutralized by reducing oil production rate and this led to the absence of effect of oil incomes on stock return of Iran Khodro Company.

12. Conclusion
Since trade volume is not effective on stock return, policymakers should export and import the goods which lead to rise and motivation of capital market and international economy of the economic policymakers should be planned based on improvement of trade relations and interactions between Iran and these countries. As observed above, one of the results of this research is positive effect of oil price on stock return and generally boom of stock exchange. Therefore, it is recommended to prevent excessive dependency of national economy on oil because capital market will decline considerably with decreasing oil price. In the used research model, annual data has been used due to inaccessibility of monthly data. To achieve the research goals, monthly data of other companies can be used for estimating the model, if available. In the present research, there was no enough time for dealing with relationship between inflation and dividend. Hence, it is of special importance to study interaction between these monetary variables. The used research model was Auto Regressive With Distributed Lags (ARDL). Trend of this work can be studied using other dynamic models such as vector auto Regression method (VAR), if necessary.

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