THE EMPIRICAL STUDY OF THE RELATIONSHIP BETWEEN EXCHANGE RATE FLUCTUATIONS AND ECONOMIC GROWTH

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Abstract. The study of causes and factors of growth has always been of particular interest to economists and several growth models have been designed for it. In theoretical and empirical models, several explanatory variables explain the economic growth. The purpose of many of the empirical studies on economic growth is to determine the importance of the effect of one or a set of explanatory variables on economic growth. On the one hand, exchange rate fluctuations and changes in the value of the national currency against foreign currency are so important that international monetary and financial institutions, especially the IMF, emphasize the need to pay attention to this variable and always recommend interference in the foreign exchange market to reduce fluctuations. Therefore, the present study tries to examine the relationship between exchange rate and its fluctuations, foreign direct investment, exports and imports with economic growth. The implementation of this study as a case study will be at the level of the Iranian economy, and therefore the available data from 2006 to 2015 comprises its community and its statistical sample. Multivariate linear regression model has been used to test the hypotheses in this study. The results of the study indicate that: (1) exchange rate fluctuations have an adverse effect on economic growth; (2) direct foreign investment has a direct effect on economic growth; (3) foreign exchange does not affect economic growth; (4) exports has a direct impact on economic growth; and (5) imports do not affect economic growth.

Keywords: exchange rate fluctuations, foreign direct investment, foreign exchange rate, exports, imports, economic growth.

Introduction. Adopting appropriate exchange rate policies in developing countries has always been controversial. The debates focus on the extent of exchange rate fluctuations in confronting the internal and external shocks. Exchange rate fluctuations play a crucial role in the country's economic performance. Hence, in order to investigate the effect of exchange rate fluctuations on the growth of production and demand of the country, judging on the desirable amount of these fluctuations is inevitable [1]. By decreasing the value of the currency of the country, the price of foreign goods becomes more expensive than domestic goods, and the international competition improves. The final result can be an improvement in economic activity. In other words, due to the devaluation of the domestic currency, the expenditures shift from the foreign goods to domestic commodities. Of course, the success of the depreciation of the currency in stimulating foreign trade balances depends to a large extent on the movement of demand on the right side and the capacity of the economy to supply additional demand through the supply of more commodities [2]. This has been observed in countries of the Group of Seven [3]. From the point of view of traditional economists, the effect of depreciation of money on the economy is exponential. While new structuralists emphasize on the contractile effect of money depreciation on the economy [4]. The obvious witness of this issue is the economies in which Marshall Lerner's conditions are violated, and the devaluation of money leads to a reduction in production [5].

In the economic literature, the study of the causes of economic growth has taken on a special place and attracted the attention of many economists, and has received a large volume of studies in this context. Early studies have focused on the role of physical capital as a factor in growth, and recent studies have broadened the concept of capital from a narrower range of machinery and equipment to a wider range of which cognized knowledge in humans and research, on the one hand, and social institutions as Social capital, on the other hand, has also been attempting to overcome the deficiencies of classical economic growth. Therefore, the present study has examined the relationship between exchange rate fluctuations and economic growth.

Theoretical foundations. The exchange rate as a criterion for the equality of the national currency of one country against the currency of other countries reflects its economic situation in comparison with other countries [6]. This exchange rate affects exports through affecting domestic and imported prices. Therefore, determining and moving towards an appropriate and somewhat stable exchange rate is of especial importance [7]. The real exchange rate fluctuations affect not only export and import and balance of payments, but also the structure and level of employment and the allocation of resources in a single economy [8]. Increasing prices of raw materials, intermediate goods and capital equipment will lead to an increase in finished product prices.

Based on the purchasing power equality approach, in the long term and assuming the stability of other conditions, the nominal exchange rate has a direct and one-to-one relationship with the general level of domestic prices and the reciprocal and one-to-one relationship with the general level of external prices. In other words, the growth of the exchange rate in the long term and, assuming the stability of other conditions, has a direct and one-to-one relationship with the difference between the domestic and foreign inflation rates. The general level of prices (both inside and outside) is the result of many developments in the real and nominal part of the (domestic and foreign) economy. Developments in the real sector (changes in productivity, population and production levels), along with developments in the nominal sector (changes in the volume of money, liquidity, and credits), ultimately reflect the general level of prices. Therefore, the effect of the nominal exchange rate on the general level of domestic and foreign prices is, in fact, the effect of the nominal exchange rate on the outcome of many of the real and nominal changes in the economy both inside and outside.

Maintaining the stability of the foreign exchange market is one of the objectives of the exchange rate management under the creeping foreign exchange system in the currency corridor. Severe exchange rate fluctuations and widespread uncertainties are one of the major factors of price distortions, weakening foreign trade, investment and national production. Accordingly, targeting stability in the foreign exchange market is absolutely justified, reasonable and defensible, but the important thing in the practical pursuit of this goal is to pay attention to the distinction between fluctuations and trends in the foreign exchange market. While efforts to curb foreign exchange market volatility are possible, attempts to curb trends in the currency market are neither useful nor possible. Therefore, an important issue in the management of the foreign exchange market is that the management of currency fluctuations and maintaining the stability of the foreign exchange market does not mean fixing the exchange rate; because fixing the currency at any rate means confrontation with future trends and increasing the probability of a crisis of balance of payments and future instabilities of currency. "Risk of exchange rate fluctuations" is a potential danger in which exchange rate fluctuations affect the financial performance of a firm through changes in the conditions of the financial statements or the cash flow of the firm and cause uncertainty about future receipts and payments to the firm [9]. In a general definition, the change risk is a risk which appears in the form of change in the value of enterprise balance sheet items, including changes in the monetary value of assets, liabilities and capital, as well as changes in other related financial statements, which is revealed at the time of the conversion of these items from one currency to the other (national currency to foreign currency or foreign currency to the national currency).

Economic risk reflects the long-term effects of exchange rate fluctuations on liquidity flows and, in general, the market value of a company. Long-term fluctuations in the exchange rate have a profound effect on the company's cash flow, because it can affect the company's ability to generate cash flows (through effects on sales levels, prices, and inputs). The long-term value of the company's market is also threatened through exchange rate changes [9]. Although the risk of exchange rate fluctuations is one of the major risks for companies operating in the international arena, its management is one of the key components in financial management. In this case, the goal of the company is to minimize losses due to fluctuations in exchange rates and maximize the revenue from these fluctuations.

Research background. Kong et al. [10] in a study entitled "Real State Investment and Economic Growth in China: A Dynamic Panel Data Approach", they explored how real investment in the states affects China's economic growth. The results of their studies indicated that real investment in the states has a negative and delayed impact on economic growth. However, this negative impact has varied across states. Lee and Brahmasrene [11] in a study entitled "The Impact of Tourism on Economic Growth and Carbon Emissions: Evidence from the Analysis of the EU Data Panel", attempted to determine the impact of tourism on the country's economic growth and the increase of carbon dioxide emissions in the country's air. To examine. The results indicated that there is a direct and significant correlation between tourism, economic growth and the amount of carbon dioxide.

Beck [12] concluded in a study entitled "Financing or Oil: Is there a Curse of Resources in Financial Development?" By implementing a cross-sectional regression for 114 countries, concluded that the relationship between financial development and growth for resource-based economies is much more important than other countries, and the negative effects on economic growth are inevitable because of less investment in the financial sector in the long term. Caporale et al. [13], in a study entitled "The endogenous growth models and the development of the financial market: evidence from four countries," using data from four countries of Chile, Korea, Malaysia and the Philippines, they studied the relationship between stock market development and economic growth. To investigate the causality relationship in this study, the value at risk model was used. The results of their studies indicated that the expansion of the stock market has increased the economic growth in these four countries through increasing the efficiency and investment efficiency.

In a study entitled "Natural resources and economic growth: from dependency to diversity", Gylfason [14] in a cross-sectional and multivariate regression analysis compared the OPEC members to Norway (as a successful oil producer). The results of his studies indicated that the intensity of natural resources has a reverse relationship with the financial depth - that is, with the development of financial and monetary institutions and policies that keep inflation low and thus promote economic growth.

Model and research hypotheses

In order to test the main and subsidiary hypotheses of the present study, the following model is used which is derived from the Varney model (2016) ($\beta4$ and $\beta9$ = main hypothesis; $\beta2$ and $\beta7$ = first sub hypothesis; $\beta3$ and $\beta8$ = second hypothesis; $\beta5$ and $\beta10$ = third sub hypothesis; and $\beta6$ and $\beta11$ = fourth hypothesis):

$$\Delta yt = \beta 0 + \beta 1\Delta yt - 1 + \beta 2\Delta It + \beta 3\Delta rt + \beta 4\,\Delta ht + \beta 5\Delta mt + \beta 6\Delta xt +$$

$$\beta 7\Delta It - 1 + \beta 8\Delta rt - 1 + \beta 9\Delta ht - 1 + \beta 10\Delta mt - 1 + \beta 11\Delta xt - 1 + \Delta t$$

According to the model, research hypotheses include:

1. The exchange rate fluctuations are effective on economic growth.
   2. Foreign direct investment is effective on economic growth.
   3. The foreign exchange rate is effective on economic growth.
   4. Export is effective on economic growth.
   5. Import is effective on economic growth.

Research method. Regarding the purpose, this research, is considered as an applied research, because its results can be used in managers' decisions. Also, regarding the method of inference about research hypotheses, this study is considered as the descriptive-correlative studies, because for the discovery of relationships between the variables of the research, regression and correlation techniques will be used, which is reasonably argumentative inductive. Also, since the conclusion is through the testing of existing data, the research will be in the group of positive theories.

The implementation of this study will be a case study at the level of the Iranian economy and, therefore, the available data from 2006 to 2015 comprise the community and its statistical sample. In order to collect information about the explanation of the literature, the library method and documentary studies have been used, and to achieve the necessary data for processing the research hypotheses, the information on the official website of the Central Bank has been used. Information gathering tools in this research, databases, information extracted from the Central Bank websites and the Iranian Statistics Center, theses, internal and external articles, and internet resources are valid.

Research findings. The research findings were analyzed using descriptive statistics and inferential statistics.

Descriptive Statistics. The implementation of this research is a case study on Iran's economy, and therefore the population and its statistical sample are the available data from 2006 to 2015. In this section, the mean, median (central criteria), standard deviation, maximum and minimum (dispersion criteria) the variables used are calculated and are presented in Table 1.

Table 1. Descriptive indexes of the studied variables

Research variables	Variable symbol	Mean	Median	Max.	Min.	SD
Economic growth	Δy_t	0.072	0.088	0.304	-0.168	0.168
Economic growth of the previous year	Δy_{t-1}	0.099	0.174	0.304	-0.168	0.163
Changes of direct foreign investment	ΔI_t	-0.003	-0.022	0.506	-0.345	0.261
Changes of exchange rate	Δr_t	0.155	0.067	1.05	-0.031	0.32
Changes of the annual exchange rate	Δh_t	-0.537	-0.775	3.529	-3.786	2.417
Export changes	Δm_t	0.154	0.186	0.275	-0.038	0.105
Import changes	Δx_t	0.014	0.025	0.164	-0.225	0.134
Changes of the previous year's direct foreign investment	ΔI_{t-1}	-0.005	-0.033	0.506	-0.345	0.262
Changes of the previous year's exchange rate	Δr_{t-1}	0.164	0.053	1.05	-0.031	0.338
Changes of the previous year's exchange rate fluctuations	Δh_{t-1}	-0.543	-0.755	0.529	-3.786	2.416
Export changes of the previous year	Δm_{t-1}	0.192	0.196	0.544	-0.038	0.162
Import changes of the previous year	Δx_{t-1}	0.047	0.071	0.164	-0.134	0.106

As shown in Table 1, the average value of economic growth is 0.072. Median is a point which divides a sample into two equal parts. In other words, 50% of the observations are before and 50% of the observations are thereafter. The median of the economic growth variable is 0.088. In general, scattering measures are the criteria that scan and compare the distribution of observations around the mean. One of the most important criteria for scattering is standard deviation. According to the above table, this criterion for the economic growth variable is -0.77. It should be noted that the highest amount of economic growth rate is equal to 0.304 and the lowest value is -0.168. The characteristics of other variables are also evident in Table 1.

Inferential statistics. The inferential statistics used in this research, include Pearson correlation test as well as multivariate regression, in order to explore the relationship between independent and dependent variables by controlling the influence of other variables. Meanwhile, to ensure the reliability of the results, the default tests of regression are used.

At first, we deal with the Pearson correlation analysis of the research variables. Pearson correlation test results are presented in Table 2. It is worth mentioning that in each of the cells in Table 4-2, which is the result of an intersection of a column and a row, the values of the correlation state of the two variables in the column and the intersecting row are presented. It should be noted that in any cell, the lower number indicates a significant correlation

level that, if it is smaller than 0.05, the correlation is significant. If correlation is significant (if correlation is not significant, the correlation between the two variables is completed and the result is that the lack of correlation is significant), the high number (correlation statistic) is considered, which if it is positive, then it is said that there is a direct and significant correlation and if it is negative, then it is said that there is a reciprocal and significant correlation. As indicated in Table 2, for example, there is a direct and significant correlation between economic growth and last year's economic growth. Moreover, it is evident in Table 2 that the independent variables of the study do not have a strong correlation with each other (correlation statistic is lower than ± 0.8), and therefore there is no problem in model estimation.

Table 2. Pearson correlation

Variable	Economic growth	Economic growth of the previous year	Changes of the foreign direct investment	Changes of the exchange rate	Changes of the annual exchange rate fluctuations	Export changes	Import changes	Changes of the previous year's foreign direct investment	Changes of the previous year's exchange rate	Changes of the previous year's annual exchange rate fluctuations	Export changes of the previous year	Import changes of the previous year
Economic growth	1	0.644 0.000	0.704 0.000	0.05 0.409	-0.463 0.000	0.269 0.000	0.106 0.078	0.374 0.000	0.026 0.659	-0.023 0.698	0.143 0.017	-0.151 0.012
Economic growth of the previous year		1	0.616 0.000	0.009 0.873	-0.176 0.000	0.071 0.239	-0.038 0.525	-0137 0.023	0.082 0.171	-0.056 0.35	0.073 0.224	-0.069 0.251
Changes of the foreign direct investment			1	0.067 0.109	-0.489 0.000	-0.128 0.002	-0.043 0.304	0.167 0.000	0.088 0.036	0.118 0.005	-0.025 0.549	-0.014 0.727
Changes of the exchange rate				1	0.331 0.000	0.091 0.129	0.046 0.272	0.095 0.024	-0.024 0.558	0.195 0.000	0.066 0.275	-0.091 0.03
Changes of the annual exchange rate fluctuations					1	-0.131 0.001	0.068 0.256	0.023 0.575	0.025 0.55	0.12 0.004	-0.197 0.000	-0.125 0.002
Export changes						1	-0.09 0.032	-0.097 0.021	-0.011 0.794	0.037 0.372	0.094 0.024	0.174 0.000
Impo							1	-0.121	-0.038	-0.044	0.151	0.034

rt chan ges									0.004	0.366	0.291	0.000	0.413
Chan ges of the previ ous year's forei gn direct inves tment									1	0.074 0.077	-0.062 0.141	0.117 0.005	- 0.119 0.004
Chan ges of the previ ous year's exch ange rate										1	-0.004 0.915	0.001 0.971	- 0.165 0.000
Chan ges of the previ ous year's annu al exch ange rate fluct uatio ns											1	- 0.119 0.004	0.011 0.794
Expo rt chan ges of the previ ous year												1	0.052 0.214
Impo rt chan ges of the previ ous year													1

The Jarque-Bera test is used to check the normality of the dependent variable. Based on this test, since the significance level is greater than 0.05, the distribution of the dependent variable is normal.

Table 3. *Jarque-Bera test*

Variable	Jarque-Bera test	Sig.
Economic growth	0.865	0.651

Prior to analyzing the research data, the reliability of the variables should be checked. For this purpose, we can use tests such as Levine, Lynn and Chou, I'm, Boys and Shane and Dickey Fuller Test. To do this analysis, we use the I'm, Boys and Shane test. The result of this test is presented in Table 4.

Table 4: *I'm, Boys and Shane test*

Research variables	t statistic	Level of significance
Economic growth	-8.419	0.000
Economic growth of the previous year	-9.029	0.000
Changes of the direct foreign investment	-6.521	0.000
Changes of the exchange rate	-7.98	0.000
Changes of the annual exchange rate fluctuations	-6.376	0.000
Export changes	-5.916	0.000
Import changes	-9.107	0.000
Changes of the previous year's direct foreign investment	-7.846	0.000
Changes of the previous year's exchange rate	-6.316	0.000
Changes of the previous year's annual exchange rate fluctuations	-8.984	0.000
Export changes of the previous year	-9.782	0.000
Import changes of the previous year	-7.005	0.000

The level of significance level of the research variables is less than 5% and therefore, all of the research variables in the period under study are in a stable level. Then, we dealt with identifying the appropriate method for data analysis. In order to estimate the coefficients of the research model, the integrated data approach and ordinary least squares method (OLS) are used, and the results are presented in Table 5.

Table 5. *Results of the model test*

Variable	Coefficients	Standard error	t statistic	Level of significance	VIF
Fixed amount	1.793	0.205	8.727	0.000	-
Economic growth of the previous year	0.086	0.014	5.849	0.000	1.474
Changes of the direct foreign investment	0.065	0.013	4.855	0.000	1.555
Changes of exchange rate	-0.005	0.01	-0.553	0.58	1.587
Changes of the annual exchange rate fluctuations	-0.265	0.071	-3.708	0.000	2.006
Export changes	0.206	0.028	7.242	0.000	1.234
Import changes	-0.05	0.042	-1.184	0.236	1.39

Changes of the previous year's direct foreign investment	0.042	0.005	7.311	0.000	1.394
Changes of the previous year's exchange rate	-0.044	0.043	-1.027	0.304	1.549
Changes of the previous year's annual exchange rate	-0.254	0.072	-3.525	0.000	1.152
Export changes of the previous year	0.329	0.119	2.764	0.006	1.349
Import changes of the previous year	-0.078	0.049	-1.58	0.115	1.353
F statistic		21.441	Coefficient of determination		0.686
Significance level of F statistic		0.000	Adjusted coefficient of determination		0.686
Significance level of ARCH test		0.133	Amount of Durbin-Watson		2.18
Jarque-Bera statistic		0.079	Significance level of Jarque-Bera		0.96

According to the results, since the variable t-statistic of the annual fluctuations in the exchange rate was more than -1.965 and its significance level is less than 0.05, there is a significant and inverse correlation between annual fluctuations of exchange rate fluctuations and economic growth. Similar conditions exist for the variable of annual fluctuation of the exchange rate of the last year, and the variable has a reverse and significant correlation with the dependent variable. Thus, the main hypothesis of the present study that "exchange rate fluctuations are effective on economic growth", is approved.

In addition, since the statistic of the variable t has been the foreign direct investment changes larger than + 1.965 and its significance level is less than 0.05, there is a significant and direct correlation between foreign direct investment and economic growth. Similar conditions for the variable of direct foreign investment changes occurred last year, and the variable has a direct and significant relationship with the dependent variable. Thus, the first sub-hypothesis of the present study that "direct foreign investment is effective on economic growth" is approved. Similar conditions have occurred for the variables of export changes and export changes of last year, and the variables have a significant and direct relationship with the dependent variable. Therefore, the third sub-hypothesis of the present study regarding that "exports is effective on economic growth" is approved.

On the other hand, since the t-statistic of exchange rate variable is less than ± 1.965 and its significance level is greater than 0.05, there is no significant relationship between exchange rate changes and economic growth. Similar conditions exist for the variable of the exchange rate changes of the past year, and the mentioned variable does not have a significant relationship with the dependent variable. Thus, the second sub-hypothesis of the present study that "the foreign exchange rate is effective on economic growth" is not confirmed. Similar conditions have occurred for the variables of import changes and import changes last year, and the variables do not have a significant relationship with the dependent variable. Thus, the fourth sub-hypothesis of the present study that "imports are effective on economic growth" is not confirmed.

It should be noted that last year's economic growth variable has a direct and significant relationship with the dependent variable. Durbin - Watson statistics model is also 2.18 which is between 1.5 and 2.5. Meanwhile, the significance level of the F statistic is 0.000, which is lower than 0.05, indicating the significance of the model. It should be noted that due to the fact that the values of the factor of inflation variance (VIF) for all variables is less than five, there is no collinearity problem in the model. Also, the significance level of the Arch test was higher than 0.05 and therefore, the heterogeneity problem of variance was not observed. The adjusted coefficient of determination of the model is about 63%, which indicates that about 63% of the variations of the dependent variable can be explained through the independent variables. In addition, the result of the Jarque-Bera test indicates the normality of disrupted sentences, and therefore there is no serious problem (the significance level of the Jarque-Bera test is greater than 0.05 and equal to 0.96).

Conclusion. As indicated, the test results of the hypotheses briefly indicated that (1) exchange rate fluctuations had a reversal effect on economic growth; (2) direct foreign investment had a direct effect on economic growth; (3) foreign exchange does not affect economic growth; (4) exports have a direct impact on economic growth; and (5) imports do not affect economic growth. In this regard, it is necessary to explain that in the Iranian economy, although the influence of different industries is different from the change in the exchange rate, it seems that in the short term, the positive effect of the depreciation of the exchange rate will prevailing its negative effect on the investment, but in the long term, the negative effect of the depreciation of the exchange rate will probably prevail. Therefore, the overall decline in the real exchange rate in the short term has had a negative effect on reducing the use of existing capacity for production, but leaves a positive effect through increasing the creation of new production capacities, but in the long term, the real exchange rate decline through decreasing the use of existing capacities and reducing the creation of new production capacities will weaken domestic production and economic growth.

Meanwhile, an increase in foreign direct investment will increase production and employment in the country and subsequently improve the economic climate. Thus, as foreign direct investment grows, the country can achieve more GDP and realize its economic growth goals. Exporting of the country also creates economic growth due to the increase in foreign exchange and the improvement of the conditions of production and business in the country. This is while imports rate is a two-dimensional issue that can boost economic growth and can undermine economic growth. Explaining that if this import is to boost the country's production and exports, it can boost the country's economic growth, and if it relates to imports of consumer goods and supplies only domestic consumption, it will lead to a decline in economic growth and this two-dimensional effect has led to a lack of the confirmation of the impact of imports on economic growth.

The result of the test of the main hypothesis of the present study regarding that the exchange rate fluctuations are effective on economic growth can be considered consistent with the results of Halefi [15] and in contrast to the results of Zamanzadeh [16]. The results of the first hypothesis test of the present study suggest that direct foreign investment has a direct impact on economic growth and this can be in line with Beck's results [12] and in contradiction with the results of Kong et al. [10]. Another result of the present study that the foreign exchange rate does not affect economic growth, is opposed to the results of Tavakkoli and Sayyah [1] and in line with the results of Zamanzadeh [16]. The results of the third hypothesis of the present study that exports have a direct impact on economic growth can be considered as consistent with the results of Tavakkoli and Sayyah [1] and in contradiction with the results of Samadi et al. [17]. Considering that these exchange rate fluctuations have an adverse effect on economic growth, it is recommended to the officials, managers and decision makers of the country to have serious attention to the issue of exchange rate fluctuations in order to achieve the goals of economic growth and increase of GDP, and along with other programs, maintain the stability of the foreign exchange market as an important factor determining the economy of the country.

References

1. Tavakkoli, A. and Sayyah, M. (2010). The effect of exchange rate fluctuations on economic activities of the country. Quarterly Journal of Money and Economics, 4, 59-77.

2. Dornbusch, R. (1988). Open economy macroeconomics, 2nd ed. New York: Basic Books.

3. Mendoza, E. G. (1992). The effect of macroeconomic shocks in a basic equilibrium framework. IMF Staff Papers, 39, 855–889.

4. Meade, J. E. (1951). The theory of international economic policy, I: The balance of payment. Oxford: Oxford University Press.

5. Gylfason, T. and Radetzki, M. (1991). Does devaluation make sense in least developed countries? Economic Development and Cultural Change, 40, 1–25.

6. Aqaei. K; Jabbari; A. and Karimi, M. (2008). Investigating the sources of macroeconomic fluctuations of Iran with an emphasis on real exchange rate during 1970-2005. Quarterly Journal of Economic Research, 2 (8), 41-61.

7. Yavari, K.; Reza Q., Mahdiyeh and Aqaei, M. (2011). The study of the effect of foreign exchange policies on the development of non-oil exports of the country, with an emphasis on foreign exchange policies and single currency exchange policy), Quarterly Journal of Economic Research, 2 (11), 59-86.

8. Mehrara, M. (2006). Estimated real exchange rate in Iran's Economic. Journal of Economic Research, 0-21, 167-208.

9. Dhanani, A. (2003). Foreign exchange risk management: a case in the mining industry. The British Accounting Review, 35, 35–63.

10. Kong, Y., Glascock, J. and Lu, A.R. (2016). An Investigation into Real Estate Investment and Economic Growth in China: A Dynamic Panel Data Approach. Sustainability, 8(1), 66-84.

11. Lee, J. and Brahmasrene, T. (2013). Investigating the influence of tourism on economic growth and carbon emissions: Evidence from panel analysis of the European Union. Tourism Management, 38, 69–76.

12. Beck, T. (2010). Finance and Oil: Is there a Resource Curse in Financial Development. Journal of Banking and Finance, 28 (2), 405-412.

13. Caporale, G., Howells, P. and Soliman, A. (2003). Endogenous Growth Models and Stock Market Development: Evidence from Four Countries. eview of Development Economics, 9 (2), 166–176.

14. Gylfason, T. (2004). Natural Resources and Economic Growth: from Dependence to Diversification. CEPR Discussion Paper 4804.

15. Halefi, H.R. (2007). Real exchange rate and economic growth of Iran. Journal of Economic Research, 79, 89-77.

16. Zamanzadeh, H., Bahador, A., Bastanzadeh, H., Tavakoliyan, H. (2014). Exchange rate management under the creeping foreign exchange system in the corridor. Monetary and Banking Research Center of the Central Bank of the Islamic Republic of Iran.

17. Samadi, S., Nasrollahi, Kh., Karimalian Sichani, M. (2007). Investigating the Relationship between the Development of Financial Markets and Economic Growth. Quarterly Journal of Economic Research, 6 (3), 1-16.

IMPACT OF LEGAL PRESSURE, CUSTOMER PRESSURE AND DYNAMIC CAPABILITIES ON GREEN INNOVATION PERFORMANCE, WITH EMPHASIS ON THE MEDIATING ROLE OF SENIOR MANAGEMENT SUPPORT, TRAINING, INVESTMENT IN RESEARCH AND DEVELOPMENT, AND RELATIONAL LEARNING CAPABILITIES

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Abstract. This research aims to investigate the impact of legal pressure, customer pressure and dynamic capabilities on green innovation performance, with emphasis on the mediating role of senior management support, training, and investment in research and development and relational learning capabilities at the Oil Turbo Compressor Company. This descriptive research employs correlation and Structural equation research plan. The statistical population of the study includes managers, assistants, and experts of Oil Turbo Compressor Company, 281 subjects participate in the research. They responded to questionnaires on legal pressure, customer pressure, dynamic capabilities, senior management support, training, investment in research and development, relational learning capabilities, and green innovation performance. Correlation coefficient and structural equation method have been used with SMARTPLS software to analyze the data. The results showed that the effect of legal pressure on learning abilities is not significant. The impact of legal pressure on senior management support, training, and investment in research and development is positive and significant. The impact of customer pressure on relational learning capabilities, senior management support, investment in research and development, and training is positive and significant. The impact of dynamic capabilities on relational learning capabilities, senior management support, and investment in research and development is positive and significant; but the effect of dynamic capabilities on training is not significant. The impact of relational learning capabilities, senior management support, training, and investment in research and development on the green innovation performance is positive and significant.

Keywords: legal pressure, customer pressure, senior management support, training, investment in research and development, green innovation performance.

Introduction. Environmental sustainability, ecosystem balance (environment), generational benefits (economic), and people (community) have become a major concern [1]. In addition, sustained consumption is influenced by the increased attention of corporate decision makers due to strict regulation and increased pressure on stakeholders to focus on environmental protection [2,3]. With increasing environmental concerns of consumers, governments, and communities around the world, manufacturing companies have sought to develop eco-friendly applications such as green products, green brands, and green technology [4,5]. These concerns were drawn to various industries so that important factors in the activity of companies, from the provision of raw materials to the process of producing new products in the factory, and issues that arise when consumers use the product, have environmental considerations [6,7].

The transformation or change is the biggest issue facing each organization today and accepting this change by organizations is one of the biggest factors in the survival of the organization. In fact, innovation is the guarantee of the survival of any organization in this dynamic and competitive market. Accordingly, a new concept emerged as green innovation, meaning that any innovation should contribute to improving the organization's environmental performance. For instance, innovation in production processes that save energy and natural resources, improve the process of recycling, or reduce environmental pollution [8].

Green innovation refers to the innovations in products, processes, and management that can lead organization to achieving eco-friendly sustainable competitive advantage [9,10]. Chen [11] (Qtd in: [12]) defines green innovation as a software or hardware innovation in technology that depends on green products or processes such as energy saving, waste recycling, green product design, or environmental management of organization as it seeks to reduce negative environmental impacts [12].

In general, it can be said that the goal of green innovation is to reduce environmental adverse impacts [13] and this is a significant factor in the whole value chain from supplier to consumer [14]. An examination of empirical evidence shows that few studies have examined the impact of legal pressure, customer pressure, and dynamic capabilities on senior management support, training, investment in research and development, relational learning capabilities, and green innovation performance. In order to fill this gap in the green innovation literature, this