The Effect of Macroeconomic Variables on the Changes in the Stock Market With an Emphasis on the Resistive Economy

[1]Mehdi Zamani, [2]Mostafa Heydari Haratmeh

[1]Department of Management, Naragh Branch, Islamic Azad University, Naragh, Iran

[2]Department of Management, Naragh Branch, Islamic Azad University, Naragh, Iran

Received: December 1, 2016 Accepted: January 10, 2017 Online Published:January 16, 2017

Abstract

The aim of the present study is to examine the effects of macroeconomic variables on the Tehran stock exchange price index (TEPIX) with an emphasis on the model of resistive economy. Stock exchange market as one of the major pillars of the capital market, is able to exacerbate the move toward economic growth and development through moving savings towards production. The indexes of this market are affected by various factors including macroeconomic variables. With the notification of general resistive economy policies by the Supreme Leader, this model came into the notice as an economic model of Iranian-Islamic development. The research method is by its aim, practical and from the view of nature and methodology is descriptive-analytic with the use of econometrics models ARDL, VECM, ECM, VAR. The results of these models provide that : a) there is a direct and parallel relationship between the variables of exchange rate, gross domestic product, growth rate of liquidity and the variable of the resistive economy model and the TEPIX and b) bank profit rate will have a negative relationship with the TEPIX, c) also result of the estimation of the error correction model shows that in each year about 60% of the imbalances of the TEPIX is modified towards long term balance. D) finally, making use of the resistive economy will have a positive effect on the changes of the capital market and stock which is inferable from the estimations of the models used in this study.

Keywords: Macroeconomic Variables, Stock Price index (SPI), Resistive Economy, Econometrics Models ARDL, VECM, VAR.

1. Introduction

In a general classification the economy of each country is made of two financial and factual sections. Since the process of economic growth and development needs the proper direction of financial sources towards domestic and foreign investments, the financial sector has a key role in the economic development. Economic markets are divided into two monetary and capital markets based on different criteria such as due dates for capital commitments. Banks

can be the symbol of the monetary market and the stock exchange as the symbol of capital market. The Stock Exchange is an organized and official market for the buying and selling of the stocks of companies under specific laws and regulations. The main duty of the Stock Exchange is to provide a clear and fair market for the exchange of the stocks and also it is a proper system for the supervision of the flow of transactions, market operations and the activities of its members. Its main feature is its support for the owners of ex-post savings and legal requirements from the applicants of capital. On the other hand the Stock Exchange is the center for the collection of savings and the liquidity of the private sector for securing long term investment projects.

In general, factors affecting the changes in the Stock Exchange can be divided into two categories: internal and external factors. Internal factors can be related to the organizational structure of the Stock Exchange and the external factors are related to the government's policies and strategies and the economic conditions of the country. The experiences gained in the recent years shows the effects and the vulnerability of the activities of this institute from major economic policies. The changes in the major economic policies that are recognized in the form of changes of the major variables, study and analysis of the relationship between major economic variables and the changes in the stock market in a way that investors and stock owners can predict the effects of major economic policies on the changes of price index and the productivity of the stock as factors for the success of capital market and movement towards the true economy of the country is a necessary and inevitable matter. In Iran because of the economic conditions after the war, and the effects of international relations and political interventions on the major economic variables , the TEPIX of Iran have witnessed many fluctuations. With the emergence of the resistive economy model[1] in recent years, the necessity to understand the effect of the macroeconomic variables on the changes of the stock market with an emphasis on this model can be considered as the main goal of the present study.

2. Review of the Literature

Foreign studies

Pramod Kumar and Puja (2012) have studied the relationship between the stock price index and five macroeconomic variables. In order to study the causal relationship between the changeability of the stock price and macroeconomic variables, from April 1994 to January of 2011, the Granger causality test and for the recognition of the relationship between variables the test of Johansen and the vector error correction have been used. Results in addition to the confirmation of the long term relationship between the stock price index and the macroeconomic variables show that there was a positive and significant relationship between the stock price index and the variables of industrial production index and money supply and it had a negative significant relationship with the index of wholesale price and it had no significant relationship with the two indexes of exchange rate and Treasury Bond Receipts.

Chinzara studied the uncertainty relationship of the macroeconomic variables and the stock price with the use of VAR-GARCH model for the South Africa. His findings showed a mutual relationship between these variables. Also uncertainty of the macroeconomic variables has a significant effect on the changes in the stock market.

Moshtagh et.al. studied the relationship between stock market index and the macroeconomic variables with the use of LA-VAR and EAGARCH of the generalized conditional explanatory model and investment in Pakistan. Results

[1]. The resistive economy is an approach the Supreme Leader mentioned implicitly for the first time in his speech at the beginning of Iranian year 1386 (2007) and in 2012 in a meeting with the cabinet in the week named government's week, this was explained as a new economic model.

showed that CPI and FDI have a positive relationship with stock market index and ER and TBR have a negative relationship with the stock market index.

Wang (2010) have studied the relationship between the changes in the stock market and the variables of the true gross domestic product, inflation rate and interest rate with the use of LA-VAR and EGARCH models. Results showed that there is a two way causal relationship between the stock market index and inflation and a one-way relationship from the stock market index to interest rate. Also there is no causal relationship between stock price and GDP.

review of literature for studies in Iran

Khosropiraei et.al. studied the effect of macroeconomic variables on Iran's stock exchange market. For this purpose, they have used seasonal data of different economic variables such as GDP, volume of money, inflation and exchange rate from 1991 to 2006. Based on Arbitrage pricing theory and the unit root test and cointegration self explanatory model with extensive lags. The results show that stock price index had a direct relationship with GDP and the general level of prices and an indirect relationship with the volume of money and exchange rate.

Ezatolah Abbasian has studied the effect of major economic variables on the Tehran Stock Exchange index. He has studied the effect of macro variables such as exchange rate, balance of trade, inflation, liquidity and interest rate on the general stock index from 1998 to 2005 and seasonal data. The method used was cointegration and error correction and implicit reaction functions and variance analysis. Findings showed the positive effect of exchange rate and balance of trade in long term on the stock exchange and the negative effect of inflation, liquidity and interest rate.

Majid Sameti and Mahnaz Moradian Tehrani (2007) have studied the relationship between company's value and the inflation rate with the use of Q Tobin index in the Tehran stock exchange from 1994 to 2004. Their goal was to study the relationship between company's value based on the Q Tobin index and the inflation rate for the companies active in the Tehran stock exchange from 1994 to 2004. Despite having no significant relationship between Q Tobin and inflation rate based on Pearson's Correlation Test, this relationship was not rejected for eight companies. The results of the general Regression test of the period showed the insignificance of inflation rate on the value of all of the companies. While the study of the relationship between this rate and the value of each of the companies showed the effectiveness of the inflation rate on the value of ten companies.

3.Research Methodology

3.1. Statistical sample: the sample population of the present study is the effect of macroeconomic variables on the stock exchange in Iran's economy in the time period between 1971 and 2014. Based on the nature and the type of the study the sampling method is not used.

3.2. Data collection method: data were collected in a library form from Iran's Central Bank of Iran, Iran's statistical center, Stock Exchange organization and the other official information published in the country.

3.3. Resources of the study: for data collection and the statistics the secondary data method was used from the official resources of the country including: central bank and statistical center of Iran and the website for the stock exchange market were used.

3.4 The analytical and statistical tools of the study: for data analysis the EVIEWS9, EXCEL and MICROFIT were used.

3.5. Research variables: the dependent and independent variables are provided here. Based on the goal of the study these variables were considered as dependent or independent.

Dependent variable: (Tehran Stock Exchange): the price index of the stock exchange market

Independent variables: Gross domestic product, Free Market exchange rate, liquidity volume, profit rate, rate of interest and the virtual variable for the explanation of the resistive economy approach. It should be noted that there are other factors affecting the stock exchange price index that based on the theories and also the previous studies, the above factors have been chosen.

4. Data analysis method

4.1. Vector Autoregression Model (VAR)

The model building method that is used for the study of the variables affecting the function of third person insurance application is time series in this section and from among the models in this method, the vector autoregression model is used which is an absolute econometrics method and in it the vector of variables is a function of its lags and other endogenous variables. Based on the theory of Samiz (1980) the vector autoregression model has the desirable feature that all of the variables can be considered endogenous. So this model is useful for the study of the relationships between a set of economic variables. It should be noted that VAR model can be more complete with the inclusion of exogenous variables, constant values and process.

4.2.Determination of the Optimal Time Lag Number

In the VAR model for the estimation of long term relationships the determination of the number of optimal lags will be much effective. The number of lags should not be chosen high because too many lags will make the variables statistically insignificant. The lag with the highest value of Akaike, Schwarz and Hannan-Quinn is an optimal lag or at least the minimum lag that is confirmed by one of the criteria is acceptable. If some of the independent variables affecting the dependent variable are not entered into the short term relationships of the model, the increase in the lags of the existing variables will not have a significant effect in the goodness of the error components of the model. Despite this, the increase in the length of the lags of the variables in the short term relationships will increase the number of the estimated parameters and will reduce the degree of freedom of the model.

If the number of the lags are excessively low the residuals of the regression will not behave like a process. In this case since the model cannot explain the real process of the error, its standard deviation will not be estimated correctly. The entrance of too many lags will reduce the power of the unit root, since the increase of the lags means the estimation of additional parameters in the model and will result in a reduction of their degree of freedom. For the determination of the optimal degree in VAR usually the statistics AIC, SBC and LL are used. It should be noted that

the estimation of the study model with the VAR method was firstly done with two lags as the default (pre-assumption) which based on the above criteria and more precisely the SBC criterion both Eviews and Microfit software were used based on which the best lag was equal to (1) based on the following tables.

Table1. variable lag order selection

VAR Lag Order Selection Criteria						
Endogenous variables: TEHRANSTOCK GDP EXCHANGRATE PROFITRATE LIQUIDITY DUM						
Exogenous variables: C						
Date: 05/05/16 Time: 18:21						
Sample: 1 44						
Included observations: 20						
Lag	LogL	LR	FPE	AIC	SC	HQ
0	-987.5973	NA	5.71e+35	99.35973	99.65845	99.41804
1	-829.0918	206.0572*	3.29e+30*	87.10918*	89.20022*	87.51737*
* indicates lag order selected by the criterion						
LR: sequential modified LR test statistic (each test at 5% level)						
FPE: Final prediction error						
AIC: Akaike information criterion						
SC: Schwarz information criterion						
HQ: Hannan-Quinn information criterion						

4.3. Estimation of VAR Model and Analysis of Results

The results of the preliminary tests in the previous sections show that the vector autoregression method can be used for the estimation. For this purpose the estimation was carried out by two software of Eviews and Microfit. The results of the estimation of both of the software is shown in table2.

Table2. results of Microfit estimation

Vector Autoregression Estimates						
Date: 05/05/16 Time: 18:22						
Sample (adjusted): 22 44						
Included observations: 20 after adjustments						
Standard errors in ( ) & t-statistics in [ ]						
	TEHRANSTOCK	GDP	EXCHANG RATE	PROFIT RATE	LIQUIDITY	DUM
TEHRANSTOCK(-1)	-0.641323	-26.20271	-0.243158	0.000180	-40.79912	8.03E-06
	(0.26990)	(6.09822)	(0.09502)	(4.1E-05)	(9.52305)	(1.1E-05)

	[-2.37612]	[-4.29678]	[-2.55894]	[4.41393]	[-4.28425]	[0.72357]
GDP(-1)	0.005900	1.460682	0.064185	-2.91E-05	1.712918	-1.62E-07
	(0.08655)	(1.95553)	(0.03047)	(1.3E-05)	(3.05377)	(3.6E-06)
	[0.06817]	[0.74695]	[2.10641]	[-2.22710]	[0.56092]	[-0.04556]
EXCHANGRATE(-1)	0.547752	-1.011892	0.215294	0.000121	-7.444203	-2.87E-05
	(1.08313)	(24.4723)	(0.38133)	(0.00016)	(38.2163)	(4.5E-05)
	[0.50571]	[-0.04135]	[0.56459]	[0.74222]	[-0.19479]	[-0.64418]
PROFIT RATE(-1)	349.8906	1047.990	-599.9530	0.785353	4865.718	0.033127
	(1033.75)	(23356.6)	(363.944)	(0.15619)	(36474.0)	(0.04252)
	[0.33847]	[0.04487]	[-1.64848]	[5.02822]	[0.13340]	[0.77907]
LIQUIDITY(-1)	0.010344	0.137326	-0.001673	1.66E-06	1.359893	1.50E-07
	(0.00520)	(0.11760)	(0.00183)	(7.9E-07)	(0.18364)	(2.1E-07)
	[1.98738]	[1.16777]	[-0.91309]	[2.10657]	[7.40523]	[0.69837]
DUM(-1)	38423.51	215837.6	10688.97	-2.065968	299595.0	0.204364
	(8209.88)	(185495.)	(2890.39)	(1.24043)	(289671.)	(0.33770)
	[4.68016]	[1.16358]	[3.69811]	[-1.66552]	[1.03426]	[0.60516]
C	-4499.666	-87841.83	-7846.420	10.60020	-455652.6	-0.357280
	(17643.7)	(398644.)	(6211.68)	(2.66579)	(622527.)	(0.72575)
	[-0.25503]	[-0.22035]	[-1.26317]	[3.97638]	[-0.73194]	[-0.49229]
R-squared	0.967243	0.775287	0.966234	0.944290	0.995192	0.798993
Adj. R-squared	0.952124	0.671574	0.950650	0.918578	0.992973	0.706220
Sum sq. resids	3.03E+08	1.55E+11	37549213	6.915676	3.77E+11	0.512568
S.E. equation	4827.360	109069.8	1699.530	0.729366	170324.8	0.198566
F-statistic	63.97669	7.475270	62.00099	36.72535	448.4842	8.612383
Log likelihood	-193.7120	-256.0658	-172.8331	-17.75935	-264.9802	8.261763
Akaike AIC	20.07120	26.30658	17.98331	2.475935	27.19802	-0.126176
Schwarz SC	20.41971	26.65509	18.33181	2.824442	27.54653	0.222330
Mean dependent	14947.76	394208.6	7429.640	14.17500	1467872.	0.150000
S.D. dependent	22062.34	190320.5	7650.427	2.556081	2031874.	0.366348
Determinant resid covariance (dof adj.)		5.43E+29				
Determinant resid covariance		4.09E+28				

Log likelihood	-829.0918				
Akaike information criterion	87.10918				
Schwarz criterion	89.20022				

4.4. The Interpretation of VAR Results

For the analysis and interpretation of the results of VAR it should be noted that in the estimations of the equation systems, coefficients and the percentage of the explanation of the parameters of the model do not have the importance of single equation methods. In other words, similar to the OLS regression model, for the statistical tests the estimated coefficients and also the test of the general importance of the regression (goodness of fit) through t and f statistics are not used, rather, two criteria related to the VAR, such as impulse response function, IRF and variance decomposition are used for the analyses.

Based on the above variables the regression model function VAR is presented in this form:

TEHRANSTOCK = F (GDP, EXCHANGRATE, SOODRATE , LIQUIDITY, DUM)

Before explanation about the coefficients of the variables and their significance first the significance of the whole regression is dealt with. As table 2 shows, the determination coefficient and modified determination coefficient of the regression equations are numbers close to 1(0.967 and 0.952 respectively) that shows that the explanatory variables of the model have a high ability in explaining and also statistic F=97.63 shows the significance of the total regression.

4.5. Impulse Response Runction (IRF) in the VAR Model

For the examination of the dynamism of the variable behavior in the VAR model two criteria IRF and VDF are used. In IRF criteria, the reaction of endogenous variables can be examined with the use of impulse making in the exogenous variables. Lotkopl and Raimers (1997) introduce the analysis of the reaction to impulse as a proper tool for the examination and reaching information about the mutual effects between variables in autoregression models. In fact, impulse reaction functions show the dynamic behavior of the variables of the system at the time an impulse as a standard deviation. In sum, the use of impulse reaction functions in the VAR shows the most expressive results for the analysis of the mutual dynamic relationships between the variables of the system in the long term. In the analyses based on these functions, the reaction of the endogenous variables of the system can be examined in case of facing of the other variables with the impulse. In table 3 the reaction of the index of the stock exchange price towards and impulse standard deviation in the independent variables of the study is examined.

In fact, the impulse reaction function in the vector autoregression model shows the dynamic behavior mutual behavior between the variables of the model during the time after a shock with the size of a standard deviation. With the use of these functions the reactions of the indigenous variables of the system can be examined in case the other variables face a shock.

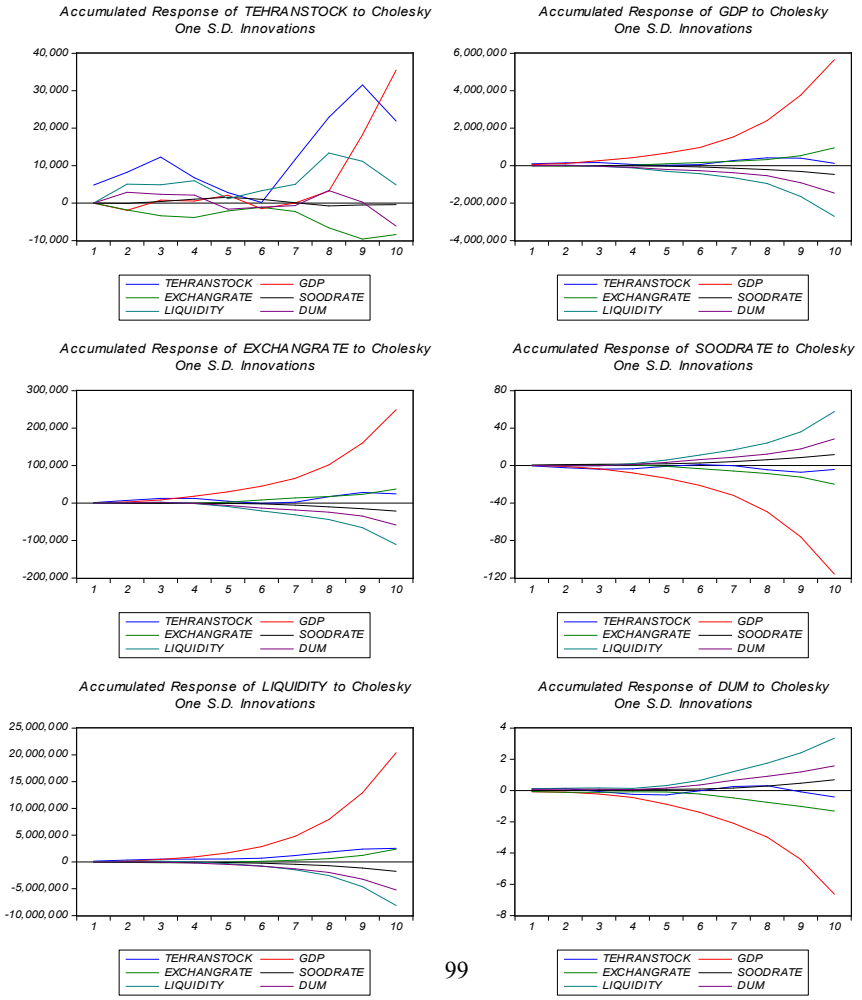
In general in the present study in order to investigate the dynamic relationships of the variables in a short time, the impulse reaction function tool is used. In fact, one of the applications of the VAR model that was used by Simz was to track the reaction of the model (variables) after the happening of an impulse in any of the variables. Reaction

functions recognize the dynamic path of the index of stock exchange price in response to an impulse in any of the variables of the system as on standard deviation. The results and the diagram of it are provided in table 3.

Table3. the reaction of the Tehran stock index to the impulses made by other variables

Accumulated Response of TEHRANSTOCK:						
Period	TEHRANSTOCK	GDP	EXCHANGRATE	PROFIT RATE	LIQUIDITY	DUM
1	4827.360	0.000000	0.000000	0.000000	0.000000	0.000000
2	8248.353	-1904.059	-1844.092	-93.26711	5062.736	2866.469
3	12287.32	786.5996	-3376.853	428.8128	4878.065	2322.995
4	6759.895	526.9207	-3838.474	1063.118	5962.100	2131.710
5	2802.919	2098.491	-2103.087	1551.070	1166.208	-1611.106
6	161.4395	-1481.019	-1116.469	1006.939	3300.760	-1098.940
7	11651.75	44.74206	-2243.482	86.91792	5017.142	-652.0487
8	22901.68	3224.007	-6574.899	-753.1200	13364.91	3332.802
9	31524.07	18267.73	-9584.799	-511.7537	11145.79	239.3101
10	21879.50	35528.78	-8379.830	-403.0887	4857.936	-6126.847

Diagram 1. The reaction of the Tehran stock index function to the impulses made by other variables



In the related diagrams in the discussion of reaction to hit for the variables it is assumed that the system is in balance and this balance is in the center of coordinate in a way that all of the variables are equal to zero at the balance. Then the effect of impulse (hit) at once on a variable is called transitory and the variable after the passage of several time periods, returns to its balance, now if this variable is not returned to zero and become positioned in a different balance value, then the effect of the hit will be called permanent. It should be noted that the amount of the hit, is being considered a standard deviation. In other words, in the examination of spontaneous reaction, the effect of one standard deviation of the impulse of one variable on the other variables is analyzed.

Table 3 shows the reactions of the index of Tehran Stock price toward one impulse standard deviation in the explaining positions of the model during a 10 year period. The results of the impulse reaction function for the Stock Exchange price index function shows that the shock because of change in any of the variables in the period, had its effect and after 10 periods the effect will disappear. In other words, the effect of each impulse or shock have affected the stock price index function as much as on standard deviation on all of the explanatory variables and will be balanced in the tenth period. In other words, balance starts from the second period onward, which is obvious in both figures.

4.6. Forecast Error of Variance Decomposition in VAR Model

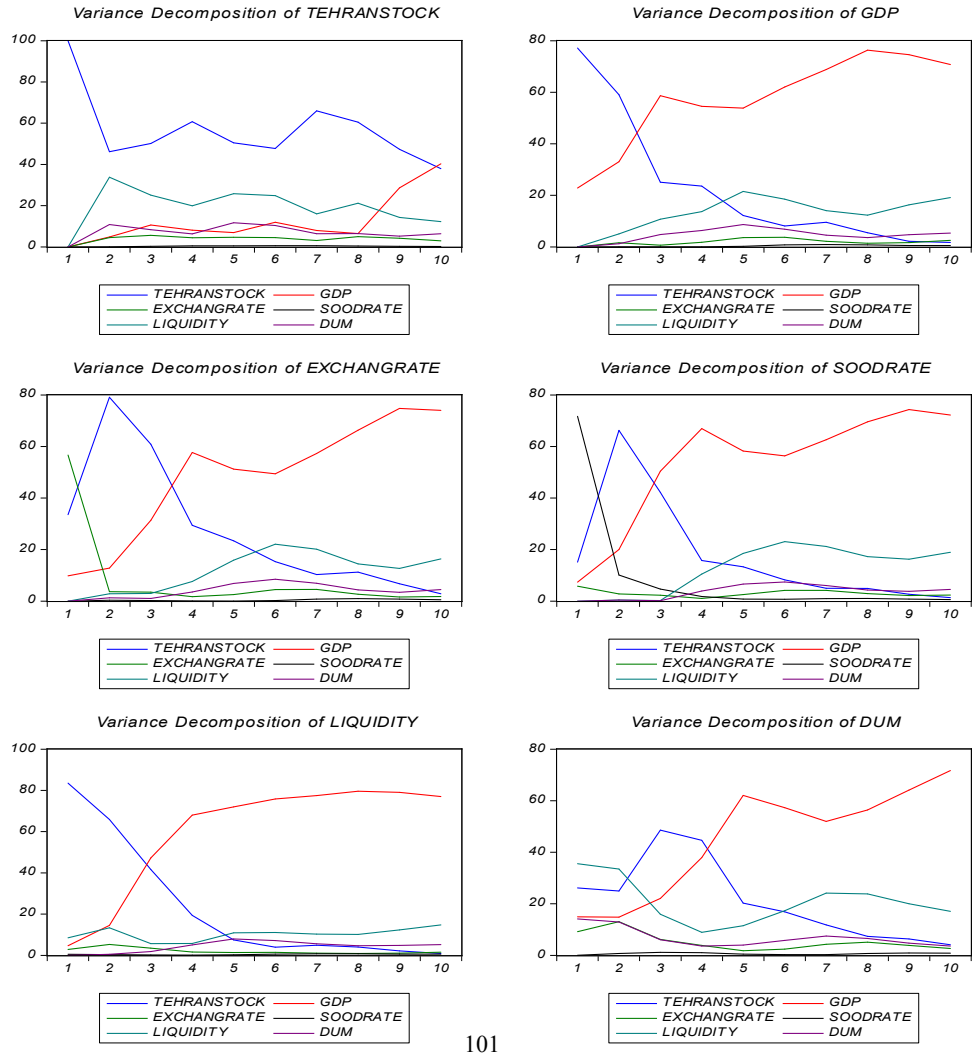
In the criteria of variance decomposition the share or participation percentage of the resulted impulses in the mentioned variables is examinable in the variance of forecast error of the variables. In other words, the decomposition of the variance of forecast error in the vector autoregression model helps us to understand that the changes of one variable (time series) have been affected by the error of the variable itself and to what extent of the components of the errors of the other variables inside the system. The base of the analysis based on Forecast error of variance decomposition for dynamism in a vector auto regression is based on the comparison of the share of each of the variables in each time series from the forecast error of that series. In other words, in each time series, any variable that has a higher share of standard deviation, will have a higher share in the cause of changes in the dependent variable. In other words, with an increase in the time of the time series then variance prediction of the forecast error is increased as well. In sum, it can be said that with the variance decomposition of forecast error it can be studied that the changes of one series is to what extent affected by the components of the errors of the series itself and to what extent the changes of one series is affected by the components of the errors of the other variables inside the system.

In this section based on the estimated mode, the variance decomposition of the stock price index function is done. The forecast error of the variables during different periods since it is calculated based on the previous years' errors, will increase during time series. The source for this error is change in the current values and future impulses. Based on the results of the table, in the first period 100% of the changes in the stock exchange price index is resulted by the variable itself but it will have a downtrend during time. Also the results show that in the long term (10 year period) the changes in the stock price index is resulted from the model for 96.37% by the variable itself, 28.40% by the GDP variable, 89.2% by the variable of the exchange rate, 02.0% by the variable of profit rate, 27.12% by the variable of volume of liquidity and 37.6% by the virtual variable that shows the resistive economy approach.

Table4. variance decomposition stock price index function

Variance Decomposition of TEHRANSTOCK:							
Period	S.E.	TEHRANSTOCK	GDP	EXCHANGRATE	PROFITRATE	LIQUIDITY	DUM
1	4827.360	100.0000	0.000000	0.000000	0.000000	0.000000	0.000000
2	8711.449	46.12848	4.777270	4.481095	0.011462	33.77456	10.82714
3	10118.97	50.12016	10.61109	5.615614	0.274691	25.06542	8.313025
4	11612.09	60.71780	8.107728	4.422350	0.506975	19.90537	6.339778
5	13900.61	50.47426	6.936061	4.644636	0.477007	25.79406	11.67397
6	14802.21	47.69728	11.96467	4.540328	0.555799	24.82704	10.41489
7	18939.98	65.93796	7.956889	3.127279	0.575437	15.98542	6.417013
8	24503.53	60.47333	6.437283	4.993055	0.461323	21.15652	6.478491
9	30408.78	47.30660	28.65429	4.221823	0.305847	14.26992	5.241522
10	37378.93	37.96628	40.28877	2.898035	0.203263	12.27398	6.369667

Diagram2. Variance decomposition of stock price index function



Since, the criteria for variance analysis in the VAR model shows the quality of the changes of the dependent variable by the independent variables that have explanatory ability then with considering the percentage of explanation the exogenous or endogenous of the variables can be talked about. Since almost 38 percent of the changes in the stock price index is explained by the variable itself, it could cautionary be said that the index of stock price is a exogenous variable; since during the 10 year period, 40% of the changes for the demand of stock price index is explained by the variable GDP, it could be concluded that during time, the explanatory ability of this variable is increasing and so this variable is endogenous.

4.7. The Estimation of the Model With the Auto Regression Method With Large Lags

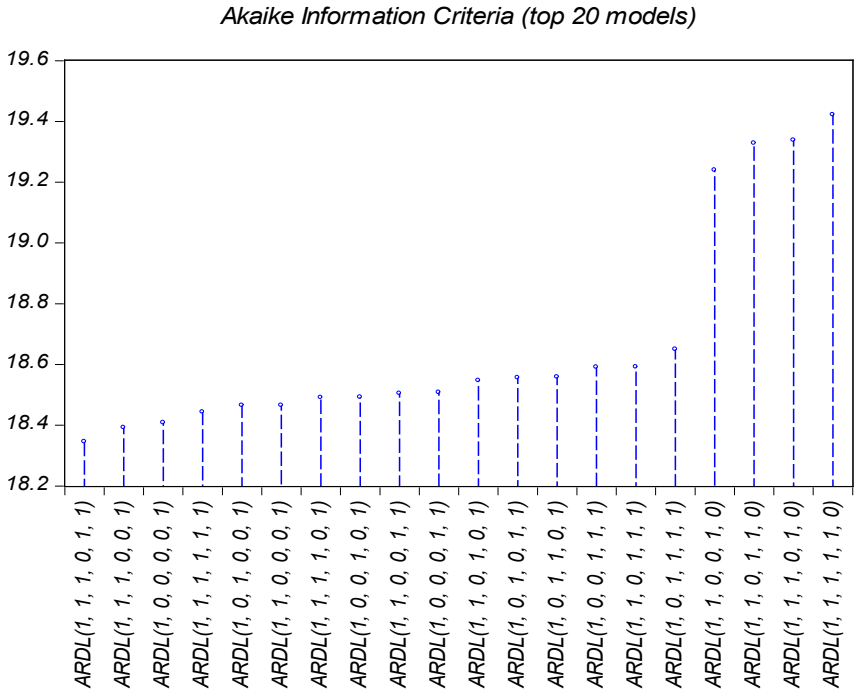
The results of the estimation of the first model with the autoregression method with large lags is shown in table 5. As it is noticed the estimated determination coefficient is 0.999 that shows the high explanatory power of the model. Also, all of the variables have a significance level of 95% and have a high validity. From these results the test of the existence or non-existence of a high term relationship, if the sum of the coefficients of the variables with the lag related to the dependent variable is less than 1 then the dynamic model will have a tendency towards a high term balance model that the following table shows the same thing.

Table5. model estimation with the ARDL method

Dependent Variable: TEHRANSTOCK				
Method: ARDL				
Date: 05/13/16 Time: 01:04				
Sample (adjusted): 22 44				
Included observations: 20 after adjustments				
Maximum dependent lags: 1 (Automatic selection)				
Model selection method: Akaike info criterion (AIC)				
Dynamic regressors (1 lag, automatic): GDP EXCHANGRATE LIQUIDITY SOODRATE DUM				
Fixed regressors: C				
Number of models evalulated: 32				
Selected Model: ARDL(1, 1, 1, 0, 1, 1)				
Variable	Coefficient	Std. Error	t-Statistic	Prob.*
TEHRANSTOCK(-1)	0.400006	0.238311	1.678503	0.1276
GDP	0.021122	0.009869	2.140265	0.0610
GDP(-1)	-0.089755	0.049537	-1.811876	0.1034
EXCHANGRATE	0.491908	0.469512	1.047701	0.3221
EXCHANGRATE(-1)	0.749579	0.459789	1.630266	0.1375
LIQUIDITY	0.006482	0.002774	2.336752	0.0443
PROFITRATE	-801.4950	816.5178	-0.981601	0.3519
PROFITRATE(-1)	1051.915	884.0477	1.189885	0.2645

DUM	5029.989	3423.837	1.469109	0.1759
DUM(-1)	23977.36	5678.213	4.222694	0.0022
C	14386.50	12310.84	1.168605	0.2726
R-squared	0.996090	Mean dependent var		14947.76
Adjusted R-squared	0.991746	S.D. dependent var		22062.34
S.E. of regression	2004.375	Akaike info criterion		18.34554
Sum squared resid	36157687	Schwarz criterion		18.89320
Log likelihood	-172.4554	Hannan-Quinn criter.		18.45245
F-statistic	229.2965	Durbin-Watson stat		2.122106
Prob(F-statistic)	0.000000			
*Note: p-values and any subsequent tests do not account for model selection				

Diagram3. Akiak information index (calculated for 20 models)



The null hypothesis and the hypothesis related to the mentioned test above is :

The numbers in the parentheses above and the output table model estimation with the ARDL method i.e. (2,2,1,2,2,21) of the ARDL respectively show the optimum lags of the dependent variable and the explanatory variables. For the study about the existence or non-existence of convergence relationship between variables under study, it is necessary that the dependent variable have at least one lag. In the above table, this condition is being provided. So the test for the existence of non-existence of long term relationship is as follows:

The result is a t type statistic that can be compared in terms of its quantity with the critical quantities presented by Banerjee Dolado Mestre for the preferred test. These critical values are found in most of the econometrics books. (based on the above equation, the calculated statistic in this model is equal to -4.366 and since it is more than the critical value of Banerjee Dolado Mestre, so the null hypothesis is rejected saying that there is no long term relationship and so approving the existence of long term relationship.

4.8. Results of the Estimation of the Long Term Relationship

Now that we are assured that there is a long term relationship it should be calculated in the related software that is achieved by the execution of the related choice in the Eviews as its output. In this equation all of the achieved coefficients have a long term interpretation.

Table7. long term estimation of the model with the ARDL method

Long Run Coefficients				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
GDP	0.114389	0.118565	0.964786	0.3599
EXCHANGRATE	2.069166	1.289601	1.604501	0.1431
LIQUIDITY	0.010804	0.007146	1.511829	0.1649
SOODRATE	-417.370641	898.070617	-0.464741	0.6532
DUM	48346.0704	15048.568	3.212669	0.0106
C	23977.75472	26577.988	0.902168	0.3905

4.9. Correction of Error or Model With the ARDL Method

There exists an error correction ECM model proportionate to any long term relationship that relates the short term changes of the variables to their balanced long term values. These results are shown in the following table. The coefficient for the error correction in this model is equal to -0.599 that shows that in each year almost 60% of the imbalance is balanced in the next period. The negativity of this coefficient shows that imbalances move toward balance in the long term.

Table8. the estimation of the error correction model

ARDL Cointegrating And Long Run Form				
Dependent Variable: TEHRANSTOCK				
Selected Model: ARDL(1, 1, 1, 0, 1, 1)				
Date: 05/13/16 Time: 01:07				
Sample: 1 44				
Included observations: 20				
Cointegrating Form				
Variable	Coefficient	Std. Error	t-Statistic	Prob.

D(GDP)	0.021122	0.009869	2.140265	0.0610
D(EXCHANGRATE)	0.491908	0.469512	1.047701	0.3221
D(LIQUIDITY)	0.006482	0.002774	2.336752	0.0443
D(SOODRATE)	-801.49504	816.517793	-0.981601	0.3519
D(DUM)	5029.989317	3423.836641	1.469109	0.1759
CointEq(-1)	-0.599994	0.238311	-2.517690	0.0329
Cointeq = TEHRANSTOCK – (-0.1144*GDP + 2.0692*EXCHANGRATE +				
0.0108*LIQUIDITY + 417.3706*SOODRATE + 48346.0737*DUM +23977.7535)				

5. Conclusion

The results of this study can be summarized in the following order:

1. Based on the regression model from among the factors of the regression model and the tests of different regression equations, four factors were considered as the factors affecting TEPIX: Gross domestic product (GDP), rate of liquidity, exchange rate and profit rate.
2. Based on the theoretical basics, the relationship between the affecting variables and the dependent variable are acquired totally within the framework of the theoretical basics, in a way that there was a positive relationship between GDP and the TEPIX, there was a positive relationship between exchange rate and the TEPIX, there was a positive relationship between rate of liquidity and the TEPIX, there was a negative relationship between bank profit rate and the TEPIX and there was a positive relationship between the model of economy of resistance i.e. the virtual variable (DUM) and the TEPIX.
3. Based on the results related to the short term and long term relationships of table 7 these results are drawn:

a) GDP coefficient acquired from regression techniques is equal to 0.11 meaning that for each one percent increase in the GDP, about 0.11 % of the total index of stock price is increased, which shows the positive and direct relationship of these two variables. The statistic t=0.9647 related to this coefficient shows the statistical validity of the GDP coefficient with a level of confidence of 64 percent.

b) The other effective factor on the results are drawn, the rate of exchange, is one of the major economic variables. The coefficient acquired from the regression techniques for this variable is equal to 2.069 shows the effectiveness of the rate of exchange factor on results are drawn in a way that with one percent increase in the rate of exchange about 2 percent of the index of total stock price will be increased which shows a direct and positive relationship between these two variables. The t statistic related to this coefficient shows a statistical validity with a confidence level of 86% (t=1.6045).

c) The other effective factor for the index of total stock price is considered the rate of liquidity growth with a coefficient of 0.010 that is acquired through regression techniques i.e. with a one percent increase in the rate of liquidity growth about 0.10 percent the results are drawn will increase. The acquired coefficient shows a direct relationship between these two variables. The t statistic related to the rate of liquidity growth shows a statistical validity in the confidence level of 85 % 9t=1.5118).

d) The other factor affecting the index of total stock price is the bank profit rate. The regression techniques coefficient for this factor is -417.370. Its negativity is in accordance with the theoretical basics. In a way that there is a negative relationship between bank profit rate and the total index of stock price. The value of this coefficient shows that 100 percent change in the bank exchange rate variable will change the results are drawn in an opposite direction for 417 percent. The t statistic related to bank profit shows a statistical validity and the confidence level of 35% (t=00.4647).

e) The model for the economy of resistance that is shown by the virtual variable of DUM, is another factor affecting the results are drawn. The coefficient acquired through regression techniques for this factor is 48346.070. This shows a direct relationship between these two variables. T statistic for the virtual variable of DUM shows the statistic validity at the confidence level of 99% (t=3.2126).

4. All of the acquired coefficients beside confirming the theoretic basics, are statistically valid. The statistical validity of the regression analysis is considered by two statistics of t and F. for the study of the statistic validity of all of the coefficients the t statistic is used that as shown above all of the coefficients of the independent and effective variables on the results are drawn are statistically valid.

In addition to the t statistic that is used for the assessment of the statistical validity of all of the coefficients, in the regression analysis, the whole regression should have statistical validity. This test is called the test for the importance of the whole regression or the goodness of fit regression that uses the F statistic and chi square distribution (X^2).

The F statistic is equal to 325.338 with degrees of freedom of 10 and 11 that shows that the whole regression has a statistical validity. Because the F calculated from the F in the table with the same degrees of freedom and confidence level is 5% bigger, so the null hypothesis of this test:

H_1: at least in one place is opposite to zero

Is rejected. In other words the importance of the whole regression has a statistical validity.

5. Based on the results of ARDL, ECM and VAR models, some conclusions can be drawn through the modifying coefficient in the long term relationships, i.e. ECM (-1) that is considered a unique feature in such models for the quality and speed of modification in the long term. The ECM (-1) coefficient was about -0.59 that shows the high modification speed of the model, which shows the goodness of fit of the model explanation and its choice and shows that in each period, 0.60 of the imbalances of the total index of stock price is modified.

The final conclusion is that the macroeconomic variables with an emphasis on the model of resistive economy affects the total index of stock price that has represented the changes in the stock market and the sign of the variables of the model that are chosen as the major economic variables are all in accordance with the theoretical basics and are statistically significant and valid.

References

Hassanzadeh, Ali. Nazarian Rafik. Kianvand, Mehran. (2011). The effect of monetary political shocks on the fluctuations of stock price index in Iran, quarterly of Money and Economy, 9.

Moradi S, Najafizadeh, A. (2013). The effect of monetary policy on the efficiency of stock index, the first electronic conference of Iran's economic perspective.

Mousaei M, Mehrgan N and Amiri, H. 2010. The relationship of stock market and macroeconomic variables in Iran, Quarterly of economic studies and policies,59.

Eslamiyon K , Zare H. The effect of macro variables and assets replacing stock price in Iran: a self correlated model with distributive lags, Quarterly of economic studies of Iran, 29.

Stock price, quarterly of monetary knowledge of stock analysis, 7th, 22, p.71

Husseini M , Ebrahimian Siami Araghi, 2011. Studying the relationship between the indexes of macroeconomics and stock price index, the conference on dimensions and the changes of financing in Iran.

Pedram M, Shirinbakhs Sh and Rustaei A. 2013. The study of asymmetric effect of inflation.

Piraei, K and Shahsavar, M. (2009). The effect of macroeconomic variables on Iran's stock exchange market. Economic studies, 9, 1, pp. 21-38.

Saeidi P, Amiri A. (2010). The relationship between macroeconomic variables and the TEPIX, quarterly of Economic model building. 6.

Noferesti, M. 2010. The unit root and cointegration in econometrics, Agah, 3rd .

Kim, k.(2003).Dollar Exchange , Money, and Stock Price: Evidence from Multivariate Co integration and Error Correction Model. Review Of Financial Economics.

Pramod Kumar, Padhi Puja, 2012, The impact of macroeconomic fundamentals on stock prices revisited: An evidence from Indian data .

Chinzara, z., 2011 ."Macroeconomic uncertainty and conditional stock market volatility in south Africa" , south African journal of economics , 79(1) .

Mushtaq, R., Alishah, S.Z., Rehman, M.Z. and Murtaza, G. (2011), "The Relationship Between Stock Market Volatility and Macroeconomic Volatility; Evidence from Pakistan", Social Science Research Network SSRN.

Wang, X. (2010), "The Relationship between Stock Market Volatility and Macroeconomic Volatility: Evidence from China", International Research Journal of Finance and Economics- ISSN 1450 2887 , Vol. 49.

Subair, K. Salihu, O.M. (2010). Exchange Rate Volatility and the Stock Market: The Nigerian Experience.

Alagidede, P. Panagiotidis, T. Zhang, X. (2010). Causal Relationship between Stock Prices and Exchange Rates", Discussion paper NO.1.ISSN 1791-3144.