The Impact of Competition on the Increasing of the Competitiveness

Rodica Pripoaie[1]

Abstract: Generally speaking, this work presents the relation between competition and competitiveness, as the firms compete with one another in order to obtain a greater cut of the market share. At the firm level, competitiveness refers to its ability to adapt as quickly as possible to market requirements and to innovate so as to satisfy consumers. Studying consumer needs is an essential condition for delivering quality products and services, so that quality strategy determines the progress of a company in the area of competitiveness. At a national level, competitiveness can be seen as a way to increase the population's standard of living by using limited resources in the best way possible. Competitiveness is influenced in any country not only by fiscal policy, but also by monetary and foreign exchange policy.

Keywords: competition; competitiveness; quality strategy; efficiency; competitive advantage

JEL Classification: M14

1. Introduction

Generally speaking, the firms compete with one another in order to obtain a greater cut of the market share. Competition is an impulse for companies to make the highest quality goods and services at the lowest prices.

At the firm level, competitiveness refers to its ability to adapt as quickly as possible to market requirements and to innovate in order to satisfy consumers. Studying consumer needs is an essential condition for delivering products and services of high quality, so that the quality strategy determines the progress of a company in the area of competitiveness. At a national level, competitiveness can be seen as a way to increase the population's standard of living by using limited resources in the best way possible. Competitiveness is influenced in any country not only by fiscal policy, but also by monetary and foreign exchange policy.

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Competition policy influences competitiveness through the following tools:

- rewards efficient companies and penalizes inefficient ones;

- guides the state aids to objectives such as: regional development, innovation-development-research, development of small and medium-sized enterprises;

- creates a competitive environment without anticompetitive practices such as abuse of dominant position or economic concentration.

Competition is an impulse to increase the competitiveness of companies as it encourages them to be more efficient through the following methods:

- an optimal use of material, financial and human resources;
- stimulates companies to acquire know-how.

The legal regulations which block the competition have negative effects on competitiveness as it slows down the process of technological upgrade.

The more markets encourage competition between the firms, the more visible the effects on competitiveness are and so, the consumers have only to win from this. In this way, also in Romania, in the recent years, the services market liberalization for cell phones and internet, electricity and air transport has led to a great progress with positive outcomes for consumers resulted in a significant decrease of tariffs.

Because the rules application in the field of competition should be made at European standards, the national legislation regarding the competition needs to be harmonized with the acquis communautaire.

Competition policy influences economic activity both at microeconomic and macroeconomic level. At macroeconomic level, competition policy has a positive role because:

- competition between firms determines the economic growth;

- competition between companies leads to productivity gains;

- it is an important factor in the optimal utilisation of resources in the economy;

- it makes as more efficient companies to survive on the market, while of less efficient firms are forced to restructure to become more competitive or eliminated from the market;

- limits artificial price increases due to anticompetitive practices;

- leads to increase a degree of external competitiveness of companies and thus to increase exports and strengthening of the national currency;

- it stimulates increase of foreign direct investments resulting creating new jobs and thus reducing unemployment and the import of know-how.

Table 1. The essential/key sectors of the national economy from the competition policy perspective

Banking	Liberal Professions	Energy
Insurances	Health	Public Utilities
Media	Food Sector	Constructions
Transports	Electronics And Home Appliances	Automotive
	Communications And Information Technology	Products For Personal Use

Source: http://www.consiliulconcurentei.ro/uploads/docs/items/bucket12/id12185/brosura_sinteza_raport_anual_2016.pdf, p. 15

2. The Evolution of the Main Indicators Monitored by the Competition Council in Romania during the period 2009 and 2017

"A strong economy is governed by the principles of free competition, which is an essential element for consumer welfare. Where there is an economy based on competition between businesses, consumers benefit from a wide range of products and services, at the right price and a high quality. The Competition Council thus has the important role of guardian of consumer interests." (Chiriţoiu, President of Competition Council, Annual Report, 2017, Synthesis, p. 7, http://www.consiliulconcurentei.ro/uploads/docs/items/bucket13/id13183/sinteza_raport_cc_2017.pdf). The Romanian Competition Council monitors the evolution of the main indicators and presents annually a report summarizing the activities of the council and the measures taken. On the basis of the annual reports of the Competition Council from 2009 to 2017, we extracted a series of indicators that are presented in the following table:

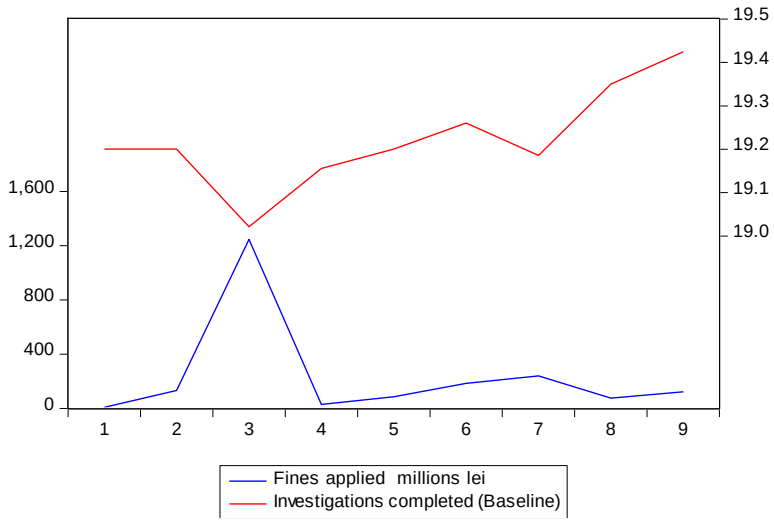
Table 2. The Evolution of the main indicators monitored by the Competition Council in Romania during the period 2009 and 2017

Year	Fines applied (millions lei)	Fines applied (millions EUR)	Budget (millions lei)	New investigations	Investigations completed	Personnel	of which inspectors
2009	8.76	2.38	41.9	27	16	299	214
2010	132.5	31.49	36.64	21	16	295	214
2011	1246.64	294.16	34.33	24	20	286	202
2012	30.22	6.78	41.25	18	22	292	211
2013	86.78	19.637	45.15	12	19	306	214
2014	184.64	41.54	62.1	9	16	308	218
2015	239.68	53.92	53.59	13	21	314	213
2016	76.8	17.1	47.23	13	25	324	224
2017	123.1	27	47.1	19	18	337	229

Source: own calculations on the base the annually reports of the Competition Council in Romania in period 2009-2017

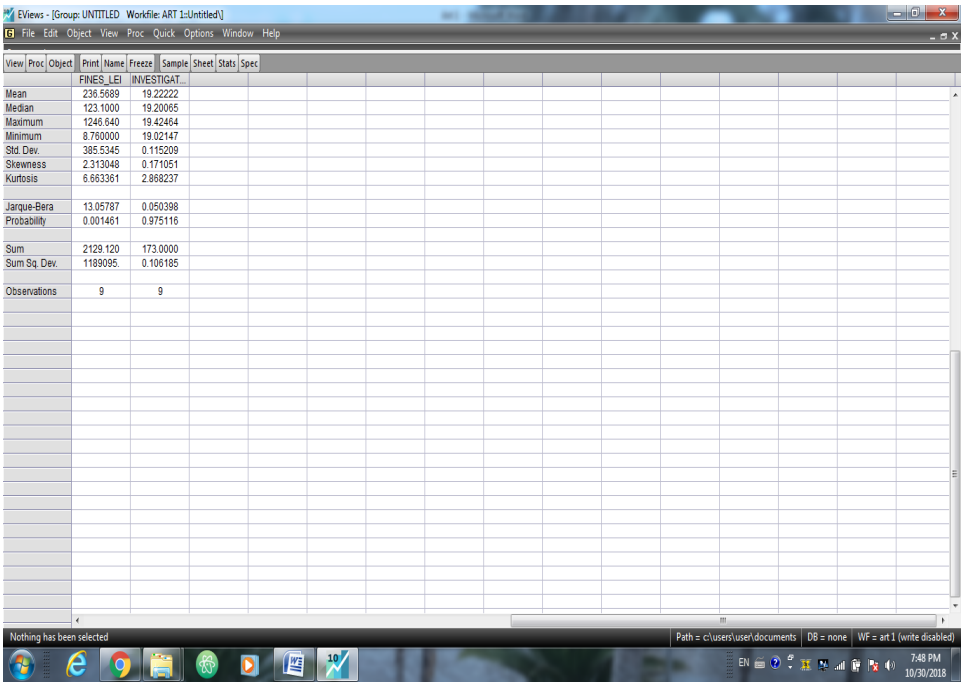
2.1. The Analysis of Data Series for Fines applied and Investigations completed with EViews 10

Fines applied data series and *investigations completed* are used to determine descriptive indicators and statistical or graphical estimation of econometric models. Evolution of the two variables analyzed in the period 2009-2017 is presented using EViews 10, as follows:



It appears that the fines applied was greatest in the third years analyzed (2011) just when the investigations completed was minimum, but this it is not specifically for the series because we can see that in the rest of the period the value of the fines was in a quasi direct relationship depending on the number of completed investigations. The previous figure shows that fines have a relatively evolution with number of investigations completed during the nine years analyzed.

Descriptive indicators for fines and number of investigations completed data series are those in the following table:



Ordinary covariance analysis between the series fines and investigations completed is as follows and we can observe it appears that the two variables are perfectly correlated.

Covariance Analysis: Ordinary
Date: 10/30/18 Time: 19:51
Sample: 1 9
Included observations: 9

Covariance Correlation	FINES_LEI	INVESTIGAT...
FINES_LEI	132121.7 1.000000	
INVESTIGATIONS...	-24.90717 -0.630852	0.011798 1.000000

Date: 10/30/18 Time: 21:20
Series: FINES_LEI INVESTIGATIONS_COMPLETED_0
Sample: 1 9
Included observations: 9
Null hypothesis: Series are not cointegrated
Cointegrating equation deterministics: C
Automatic lags specification based on Schwarz criterion (maxlag=1)

Dependent	tau-statistic	Prob.*	z-statistic	Prob.*
FINES_LEI	-3.525196	0.1226	-36.97433	1.0000
INVESTIGATIONS...	-0.703751	0.9478	-2.568867	0.9114

*MacKinnon (1996) p-values.
Warning: p-values may not be accurate for fewer than 20 observations.

Intermediate Results:

	FINES_LEI	INVESTIGATIONS_CO...
Rho - 1	-2.178804	-0.321108
Rho S.E.	0.618066	0.456281
Residual variance	71549.52	0.006486
Long-run residual variance	420508.5	0.006486
Number of lags	1	0
Number of observations	7	8
Number of stochastic trends**	2	2

**Number of stochastic trends in asymptotic distribution

Group unit root test: Summary
Series: FINES_LEI, INVESTIGATIONS_COMPLETED_0
Date: 10/30/18 Time: 21:21
Sample: 1 9
Exogenous variables: Individual effects
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 0
Newey-West automatic bandwidth selection and Bartlett kernel
Balanced observations for each test

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-1.74244	0.0407	2	16
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-0.40973	0.3410	2	16
ADF - Fisher Chi-square	5.81186	0.2136	2	16
PP - Fisher Chi-square	6.12819	0.1898	2	16

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

The previous conclusion is confirmed by the Squared Multiple Correlation shown in following table:

Dependent Variable: FINES_LEI
Method: Least Squares
Date: 10/31/18 Time: 18:06
Sample: 2009 2017
Included observations: 9

Variable	Coefficient	Std. Error	t-Statistic	Prob.
INVESTIGATIONS_COMPLETED	9.071203	46.67499	0.194348	0.8514
C	62.20020	907.5989	0.068533	0.9473

R-squared	0.005367	Mean dependent var	236.5689
Adjusted R-squared	-0.136724	S.D. dependent var	385.5345
S.E. of regression	411.0463	Akaike info criterion	15.06842
Sum squared resid	1182713.	Schwarz criterion	15.11225
Log likelihood	-65.80788	Hannan-Quinn criter.	14.97384
F-statistic	0.037771	Durbin-Watson stat	2.346896
Prob(F-statistic)	0.851423		

To determine the regression equation applies Least Squares Method. So, we obtain the following regression equation:

Estimation Command:

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LS FINES_LEI INVESTIGATIONS_COMPLETED C

Estimation Equation:

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FINES_LEI = C(1)*INVESTIGATIONS_COMPLETED + C(2)

Substituted Coefficients:

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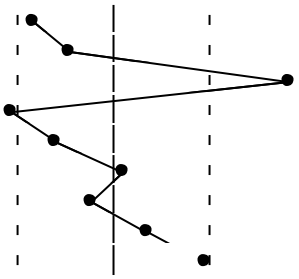
FINES_LEI = 9.0712034384*INVESTIGATIONS_COMPLETED + 62.2002005731

obs	Actual	Fitted	Residual	Residual Plot
1	8.76	282.109...	-273.34...	
2	132.5	282.109...	-149.60...	
3	1246.64	660.372...	586.267...	
4	30.22	376.664...	-346.44...	
5	86.78	282.109...	-195.32...	
6	184.64	156.014...	28.6251...	
7	239.68	313.627...	-73.947...	
8	76.8	-33.137...	109.937...	
9	123.1	-190.75...	313.850...	



In the previous figure are actual and estimated values of the feature analysis (Y) and the residual variable values and chart series. Another way of presenting the residual variable: Actual, Fitted, Residual Graphis presented in the following figure:

Correlogram of Residuals can be shows like in the following table:

Date: 10/31/18 Time: 18:18
Sample: 2009 2017
Included observations: 9

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	-0.195	-0.195	0.4684	0.494
		2	-0.268	-0.318	1.4827	0.476
		3	0.060	-0.081	1.5421	0.673
		4	0.070	-0.023	1.6379	0.802
		5	-0.155	-0.166	2.2345	0.816
		6	-0.071	-0.160	2.4019	0.879
		7	0.042	-0.131	2.4896	0.928
		8	0.017	-0.099	2.5189	0.961

Correlogram of Residuals Squared is:

Date: 10/31/18 Time: 18:21
Sample: 2009 2017
Included observations: 9

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	-0.121	-0.121	0.1817	0.670
		2	-0.133	-0.150	0.4314	0.806
		3	-0.067	-0.108	0.5059	0.918
		4	-0.079	-0.131	0.6295	0.960
		5	-0.044	-0.109	0.6764	0.984
		6	-0.096	-0.176	0.9799	0.986
		7	0.027	-0.077	1.0155	0.995
		8	0.013	-0.082	1.0319	0.998

Breusch-Godfrey Serial Correlation LM Test:
Null hypothesis: No serial correlation at up to 2 lags

F-statistic	1.118868	Prob. F(2,5)	0.3967
Obs*R-squared	2.782586	Prob. Chi-Square(2)	0.2488

Test Equation:
Dependent Variable: RESID
Method: Least Squares
Date: 10/30/18 Time: 21:33
Sample: 1 9
Included observations: 9
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
INVESTIGATIONS_COMPLETED_0	235.4301	978.7373	0.240545	0.8195
C	-4570.433	18818.62	-0.242868	0.8178
RESID(-1)	-0.482729	0.434217	-1.111725	0.3168
RESID(-2)	-0.596962	0.446062	-1.338293	0.2384

R-squared	0.309176	Mean dependent var	2.41E-12
Adjusted R-squared	-0.105318	S.D. dependent var	299.1376
S.E. of regression	314.4957	Akaike info criterion	14.64092
Sum squared resid	494537.6	Schwarz criterion	14.72858
Log likelihood	-61.88414	Hannan-Quinn criter.	14.45176
F-statistic	0.745912	Durbin-Watson stat	1.910317
Prob(F-statistic)	0.569355		

Heteroskedasticity Test: Breusch-Pagan-Godfrey
Null hypothesis: Homoskedasticity

F-statistic	3.724522	Prob. F(1,7)	0.0949
Obs*R-squared	3.125612	Prob. Chi-Square(1)	0.0771
Scaled explained SS	1.544452	Prob. Chi-Square(1)	0.2140

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 10/30/18 Time: 21:34
Sample: 1 9
Included observations: 9

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	10682045	5493892.	1.944349	0.0929
INVESTIGATIONS_COMPLETED_0	-551575.3	285804.8	-1.929902	0.0949

R-squared	0.347290	Mean dependent var	79540.72
Adjusted R-squared	0.254046	S.D. dependent var	107831.3
S.E. of regression	93132.44	Akaike info criterion	25.91456
Sum squared resid	6.07E+10	Schwarz criterion	25.95839
Log likelihood	-114.6155	Hannan-Quinn criter.	25.81998
F-statistic	3.724522	Durbin-Watson stat	1.728812
Prob(F-statistic)	0.094936		

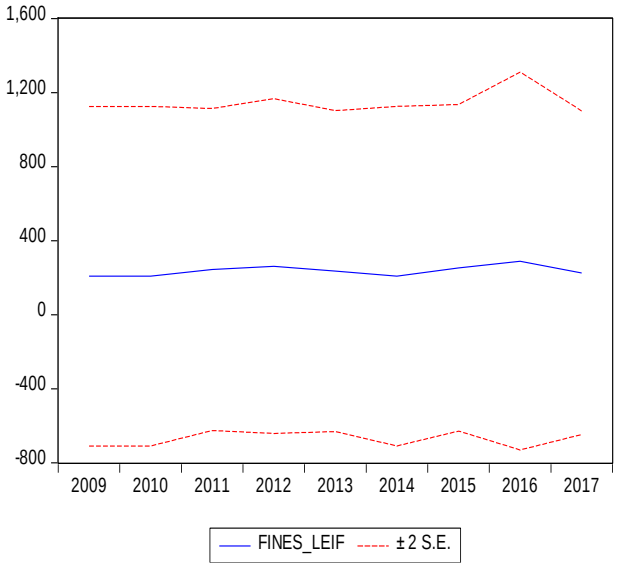
We can estimate the fines applied with Least Squares Method thus:

Dependent Variable: FINES_LEI
Method: Least Squares
Date: 10/31/18 Time: 18:07
Sample: 2009 2017
Included observations: 9

Variable	Coefficient	Std. Error	t-Statistic	Prob.
INVESTIGATIONS_COMPLETED	9.071203	46.67499	0.194348	0.8514
C	62.20020	907.5989	0.068533	0.9473

R-squared	0.005367	Mean dependent var	236.5689
Adjusted R-squared	-0.136724	S.D. dependent var	385.5345
S.E. of regression	411.0463	Akaike info criterion	15.06842
Sum squared resid	1182713.	Schwarz criterion	15.11225
Log likelihood	-65.80788	Hannan-Quinn criter.	14.97384
F-statistic	0.037771	Durbin-Watson stat	2.346896
Prob(F-statistic)	0.851423		

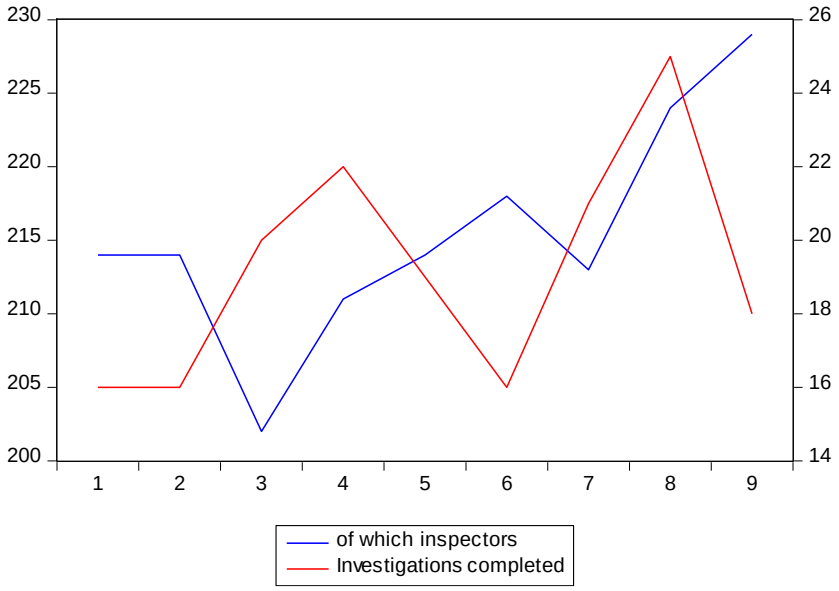
The forecast for fines applied is as follows:



Forecast: FINES_LEIF	
Actual: FINES_LEI	
Forecast sample: 2009 2017	
Included observations: 9	
Root Mean Squared Error	362.5087
Mean Absolute Error	222.8924
Mean Abs. Percent Error	413.0542
Theil Inequality Coef.	0.539646
Bias Proportion	0.000000
Variance Proportion	0.863482
Covariance Proportion	0.136518
Theil U2 Coefficient	0.752713
Symmetric MAPE	89.40445

2.2. The Analysis of Data Series for Investigations Completed and Number of Inspectors with Eviews 10

Investigations completed data series and *number of Inspectors* are used to determine descriptive indicators and statistical or graphical estimation of econometric models. Evolution of the two variables analyzed in the period 2009-2017 is presented using EViews 10, as follows:



It appears that the investigations completed was greatest in the fourth years analyzed (2012) and we can see in the rest of the period the value of the fines was in a relative direct relationship depending on the number of inspectors.

Descriptive indicators for number of investigations completed and of inspectors data series are those in the following table:

	INSPECTORS	INVESTIGATIONS_COMPLETED
Mean	215.4444	19.22222
Median	214.0000	19.00000
Maximum	229.0000	25.00000
Minimum	202.0000	16.00000
Std. Dev.	7.715425	3.113590
Skewness	0.170966	0.519171
Kurtosis	2.868266	2.259304
Jarque-Bera	0.050352	0.610044
Probability	0.975138	0.737107
Sum	1939.000	173.0000
Sum Sq. Dev.	476.2222	77.55556
Observations	9	9

Ordinary covariance analysis between the series investigations completed and number of inspectors is as follows and we can observe it appears that the two variables are perfectly correlated.

Covariance Analysis: Ordinary
Date: 10/30/18 Time: 17:23
Sample: 1 9
Included observations: 9

Covariance Correlation t-Statistic	INSPECTORS	INVESTIGAT...
INSPECTORS	52.91358	
	1.000000	

INVESTIGATIONS...	0.790123	8.617284
	0.037002	1.000000
	0.097965	-----

Date: 10/30/18 Time: 19:05
Sample (adjusted): 3 9
Included observations: 7 after adjustments
Trend assumption: Linear deterministic trend
Series: INSPECTORS INVESTIGATIONS COMPLETED
Lags interval (in first differences): 1 to 1

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.994361	36.45655	15.49471	0.0000
At most 1	0.029669	0.210827	3.841466	0.6461

Trace test indicates 1 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.994361	36.24572	14.26460	0.0000
At most 1	0.029669	0.210827	3.841466	0.6461

Max-eigenvalue test indicates 1 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegrating Coefficients (normalized by b'*S11*b=I):

INSPECTORS	INVESTIGATIONS	COMPLETED
-0.017124	0.696665	
0.263028	0.182935	

Unrestricted Adjustment Coefficients (alpha):

D(INSPECT...	5.075737	0.468118
D(INVESTIGA...	-2.615586	0.230707

1 Cointegrating Equation(s): Log likelihood -20.18872

Normalized cointegrating coefficients (standard error in parentheses)

INSPECTORS	INVESTIGATIONS_COMPLETED
1.000000	-40.68301
	(1.79533)

Adjustment coefficients (standard error in parentheses)

D(INSPECT...	-0.086918
	(0.02713)
D(INVESTIGA...	0.044790
	(0.01338)

The previous conclusion is confirmed by the Squared Multiple Correlation shown in following table:

Dependent Variable: INVESTIGATIONS_COMPLETED
Method: Least Squares
Date: 10/30/18 Time: 19:22
Sample: 1 9
Included observations: 9

Variable	Coefficient	Std. Error	t-Statistic	Prob.
INSPECTORS	0.014932	0.152425	0.097965	0.9247
C	16.00513	32.85775	0.487104	0.6411

R-squared	0.001369	Mean dependent var	19.22222
Adjusted R-squared	-0.141292	S.D. dependent var	3.113590
S.E. of regression	3.326289	Akaike info criterion	5.434721
Sum squared resid	77.44937	Schwarz criterion	5.478549
Log likelihood	-22.45625	Hannan-Quinn criter.	5.340141
F-statistic	0.009597	Durbin-Watson stat	1.679740
Prob(F-statistic)	0.924706		

To determine the regression equation applies Least Squares Method. So, we obtain the following regression equation:

Estimation Command:

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LS INVESTIGATIONS_COMPLETED INSPECTORS C

Estimation Equation:

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INVESTIGATIONS_COMPLETED = C(1)*INSPECTORS + C(2)

Substituted Coefficients:

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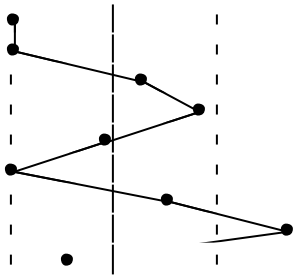
INVESTIGATIONS_COMPLETED = 0.0149323378441*INSPECTORS + 16.0051329911

obs	Actual	Fitted	Residual
1	16	19.2006...	-3.2006...
2	16	19.2006...	-3.2006...
3	20	19.0214...	0.97853...
4	22	19.1558...	2.84414...
5	19	19.2006...	-0.2006...
6	16	19.2603...	-3.2603...
7	21	19.1857...	1.81427...
8	25	19.3499...	5.65002...
9	18	19.4246...	-1.4246...



Correlogram of Residuals can be shows like in the following table:

Date: 10/30/18 Time: 19:31
Sample: 1 9
Included observations: 9

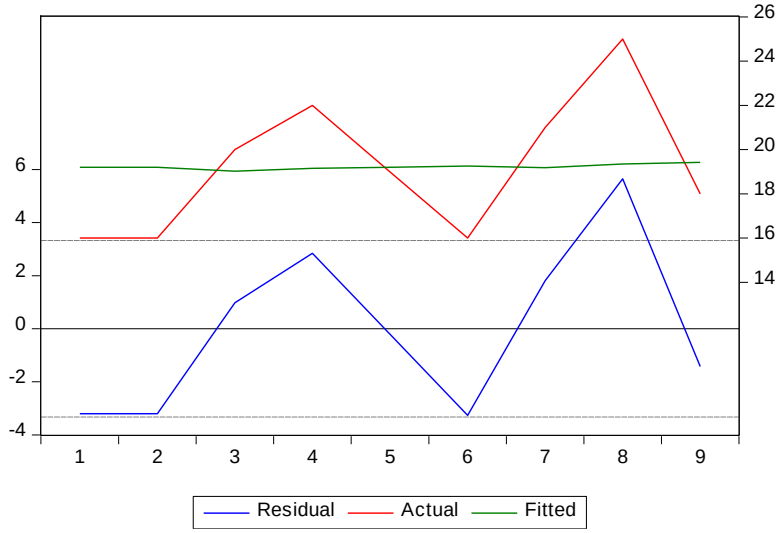
Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	0.081	0.081	0.0810	0.776
		2	-0.556	-0.566	4.4556	0.108
		3	-0.038	0.115	4.4800	0.214
		4	0.377	0.078	7.2961	0.121
		5	0.079	0.058	7.4499	0.189
		6	-0.326	-0.149	10.967	0.089
		7	-0.175	-0.108	12.476	0.086
		8	0.059	-0.246	12.820	0.118

Correlogram of Residuals Squared is:

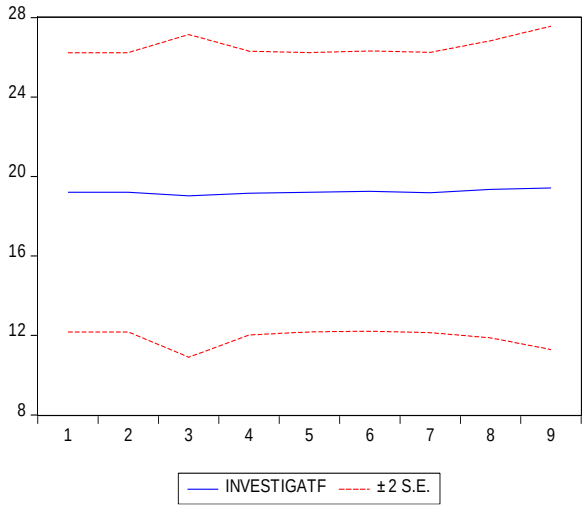
Date: 10/30/18 Time: 19:32
Sample: 1 9
Included observations: 9

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	-0.405	-0.405	2.0341	0.154
		2	0.236	0.086	2.8231	0.244
		3	-0.318	-0.236	4.4917	0.213
		4	0.098	-0.139	4.6821	0.321
		5	-0.238	-0.248	6.0874	0.298
		6	0.105	-0.170	6.4542	0.374
		7	0.036	0.027	6.5193	0.481
		8	-0.014	-0.134	6.5394	0.587

In the previous figure are actual and estimated values of the feature analysis (Y) and the residual variable values and chart series. Another way of presenting the residual variable: Actual, Fitted, Residual Graphis presented in the following figure:



The forecast for investigations completed is as follows:



Forecast: INVESTIGATF	
Actual: INVESTIGATIONS_COMPLETED	
Forecast sample: 1 9	
Included observations: 9	
Root Mean Squared Error	2.933511
Mean Absolute Error	2.508218
Mean Abs. Percent Error	13.15738
Theil Inequality Coef.	0.075865
Bias Proportion	0.000000
Variance Proportion	0.928636
Covariance Proportion	0.071364
Theil U2 Coefficient	0.744492
Symmetric MAPE	12.98588

3. Conclusions

The companies compete with one another in order to obtain a greater cut of the market share. Competition is an impulse for companies to make the highest quality goods and services at the lowest prices. Competitiveness refers to its ability to adapt as quickly as possible to market requirements and to innovate in order to satisfy consumers. Studying consumer needs is an essential condition for delivering products and services of high quality, so that the quality strategy determines the progress of a company in the area of competitiveness. At a macroeconomic level, competitiveness can be seen as a way to increase the population's standard of living by using limited resources in the best way possible.

Competition policy influences competitiveness through the following tools: rewards efficient companies and penalizes inefficient ones and creates a competitive environment without anticompetitive practices such as abuse of dominant position or economic concentration.

The legal regulations which block the competition have negative effects on competitiveness as it slows down the process of technological upgrade.

The more markets encourage competition between the firms, the more visible the effects on competitiveness are and so, the consumers have only to win from this. Because the rules application in the field of competition should be made at European standards, the national legislation regarding the competition needs to be harmonized with the acquis communautaire.

The Romanian Competition Council monitors the evolution of the main indicators and presents annually a report summarizing the activities of the council and the measures taken.

4. References

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