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THE METHODOLOGY OF TESTING THE CAUSALITY BETWEEN THE ROMANIAN MUTUAL FUNDS MARKET AND THE ECONOMY'S DYNAMICS

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Abstract

The paper tests and evaluates the causality between the dynamics of the Romanian mutual fund market and the economy. Using the Granger causality test, a regression analysis has been developed on quarterly data during 2004Q3 – 2012Q2 for the Romanian economy. Based on this relationship, we can emphasize that the controversial debate upon the economic growth and the mutual fund market has became a complex research subject.

Therefore, due to its complexity, the timeliness and the continuous growth of the investment funds area, this paper complements the existing literature by identifying the causal linkage between the mutual fund market and the economy. The paper is organized as it follows. First part presents the main premises that have emphasized our research. Second part presents a brief literature review and extracts the studies that appreciate best the relationship between the analyzed variables. Next section is set on defining the potential correlation between the analyzed variables. Then, section 4 tests the causality by using the R facility. The last part concludes.

1. INTRODUCTION

Romanian mutual fund market has become more attractive for investors since the Romanian domestic funds are efficient competing in the European Common Market. Being considered a "saving service/product", the mutual funds are directly connected to the savings process (Diaconita M., 2003:19). In order to promote the Romanian stock market, the collective and portfolio investments have significantly stimulated the savings. Therefore it is important to see the internal savings contribution on growing the stock market capitalization. All the elements comprised on the savings-investments circuit, present the interdependence between the stock market and economy development.

Evidencing the evolution of the economic growth and the mutual fund investments in Romania during the last 35 years, could be observed an oscillating fluctuation, with several syncope that might have a seasonal effect on the economy. In order to see the mutual fund market contribution, Khorana et al (2005) reports the mutual fund industry's dimension to the GDP level. Following this model, we identify that the European mutual funds and specially the Romanian mutual funds have registered a spectacular growth during 2003-2009, with an average annual growth of 12.90% (Radu I., 2011: 25).

As a consequence, we address the following issues that have enhanced our interest for study: first, we test whether the mutual fund investments cause the economic growth in Romania and secondly we try to identify whether there is a causal relationship between the mutual fund investments and economic growth in Romania.

2. DATA

In order to investigate the causality between the mutual funds dynamics and the economy we collected annual and quarterly data from several sources like Investment Company Institute (abr.ICI), the European Fund and Asset Management Association (abr. EFAMA) and national mutual fund associations (i.e. Romanian Association of Asset Managers, www.aaf.ro) and professional data provider (www.kmarket.ro).

The time period of analysis is quarter time series data from 1998 Q2 to 2012 Q2 in Romania. Also, please note that Romania revalued their currency as of Q3 2005, and therefore, we use data that reflect these changes.

3. METHODOLOGY

Inspired by the previous studies about the impact of the investments on the economic growth, our paper seeks to identify if there is a pattern connection in the case of Romanian economy between the mutual fund investments (defined by the Total Net Assets – abr. TNA) and economic growth (defined by the Gross Domestic Product – abr. GDP). Therefore, we set our analysis on following a systematic methodology as presented in Table 1.

Table 1. *Empiric Analysis Methodology*

Stage - steps		***Tests***
1	Testing for stationary – unit root tests	**OLS Regression** **Augmented Dickey-Fuller (ADF)** **Kwiatkowski-Phillips-Schmidt-Shin (KPSS)**
2	Testing for co-integration	*Individual co-integration tests*

		Engle & Granger (1987) **Johansen** (1988)- Vector Auto Regression test (VAR) **Johansen & Jubelius** (1990) **Durbin Watson cointegration regression** (Bajo – Rubio, 1999) **Philips-Ouliaris** **Philips – Hansen** **Wald test statistics** *Panel settings co-integration tests* **Modified Wald test (MWALT)** **Pedroni (**1997, 1999) **Pesaran et al**. (2001) with its variations: **-Error correction model (ECM)*** **-Autoregressive Distributed Lag Model (ARDL)**	
3	Testing for causality	*Non-co-integrated series* **Granger causality test**	*Co-integrated series* **Vector Error Correction Model (VECM)**
		Toda – Yamamoto (1995)	
4	Results interpretation	Unidirectional causality Bi-directional causality No-causality	

Note: It is appropriate to use criterions for refining the time series lag length for delayed variables by using Akaike criterion or Schwarz criterion.

* Error correction model (ECM) is available on three variations – Restricted ECM (Standard t distribution), Unrestricted ECM (Banerjee, Dolado and Mestre model - 1998) and General ECM (χ^2 distribution).

3.1. DESCRIPTIVE STATISTICS

The variable economic growth is approximated by the growth of the GDP at a particular time t. The variable mutual fund investments is approximated by the ratio of the total net assets (TNA) managed in Romania by the mutual funds at a time t.

In table 2 are presented the descriptive statistics of the analyzed variables.

Table 2. *Descriptive statistics*

	TNA	**GDP**
Observations	57	57
Mean	1.152289	1.060074
Median	1.141339	1.167784
Maximum	1.955494	1.287886
Minimum	0.163088	0.517272
Std. Dev.	0.273869	0.245591
Skewness	-0.638845	-1.017903
Kurtosis	6.55762	2.326078
Jarque-Bera	33.93673	10.92186
Probability	0	0.00425

Source: Own processing in Eviews

Note: TNA represents the total net assets; GDP represents the gross domestic product

We can observe that the two variables present a positive evolution during the analyzed period. The Skewness coefficients show that the distributions of both variables present a left tail. The Kurtosis values present a leptokurtic distribution for TNA and a platykurtic distribution for GDP. Also, the Jarque-Berra values show that the two series do

not follow a normal distribution law.

We intend to follow the confirmation of "the cause precedes the effect" presumption. Therefore, we intend to verify the causality between the capital raised and managed by the investment funds (as defined by the value of the total assets (TNA)) and the economy conditions (assessed by the GDP dimension).

3.2. UNIT ROOT TESTING FOR STATIONARITY

In order to apply Granger causality test, the series should be stationary. For establishing the stationary of the variables, the series may be tested using the Augmented Dickey-Fuller (ADF) or Kwiatkowski-Phillips-Schmidt-Shin (KPSS) unit root tests. In addition, here is used the Schwarz criterion on determining the appropriate lag length for delayed variables.

The results of ADF and KPSS test show that the two series are stationary (table 3). For both tests, we used the models with constant. The bandwidth is chosen based on the Newey-West criterion by using the Barlett kernel estimator.

Table 3. *The results of ADF and KPSS test*

	ADF	**KPSS**
TNA	-5.919409***	0.076434
GDP	-2.451714	0.209509

Source: Own processing in Eviews
Note: *** represents the rejection of null hypothesis at 1% significance level.

Critical values for ADF test are: -3.552666 (1%), -2.914517 (5%), -2.595033 (10%) for TNA variable and -3.560019 (1%), -2.91765 (5%), -2.596689 (10%) for GDP variable.
Critical values for KPSS test are: 0.739 (1%), 0.463 (5%), 0.347 (10%).

3.3. CO-INTEGRATION TESTING

Co-integration concept implies the existence of a long-run relationship between the analyzed variables. The main principle of testing for co-integration is to address whether the variables are significantly deviate from a certain relationship. As a fact, if the variables are co-integrated, they move together over time and therefore any disturbances might affect the long-term dynamics. Otherwise, if two series aren't co-integrated, they may change independently far away from each other.

For performing the integration test on GDP and TNA time series it is necessary to use the Johansen (1988) test. We used the values of Trace Statistic and Max-Eigen Statistic in order to test the number of cointegrated relations, respectively the VAR model with intercept (without trend) and six lags, in order to minimize the informational criteria of Schwarz and Hannan-Quinn.

The test results are presented in table 4 and indicate a rejection of null hypothesis, so the two series are not cointegrated.

Table 4: *Johansen Cointegration test*

	Hypothesis	**Trace Statistic**	**Critical value (0.5)**	**Max-Eigen Statistic**	**Critical value (0.5)**
TNA GDP	H_0: r=0 vs H_1: r=1	33.28088***	12.3209	32.59937***	11.2248
	H_0: r≤1 vs H_1: r=2	83.11323***	15.49471	60.00863***	14.2646

Source: Own processing in Eviews
Note: *** denotes rejection of the hypothesis at the 0.05 level

3.4. GRANGER TESTING FOR CAUSALITY

On defining the causality, Awe O.O. (2012) captures and highlights the Runes's (1962) and Hinkelmann and Kempthorne's (2008) ones, as follows:

- A relation between events, process or entities in the same time series subject to several conditions.
- A relationship between events, processes or entities in a time series such that when one occurs, the other follows invariably.
- A relationship among variables such that one has the efficacy to produce or alter another.
- A relationship among variables such that without one, the other could not occur.
- A relationship between experienced events, processes or entities and extra-experimental events, processes or entities.
- A relation between something and itself (self-causality).
- A relation between an event, process or entity and the reason or explanation for it.
- A relation between an idea and an experience and
- A principle or category incorporating into experience one of the previous ones.

Approaching the causality test proposed by Granger (1969), the relationship between variables may take the following forms transposed on our interest:

- the economic changing environment (ΔGDP_n) is due to the dynamism of the mutual funds activity;
- the variations in the total net asset value of the funds (ΔTNA_n) explains the economy's dynamism;
- the economic growth (ΔGDP_n) helps to predict the total net assets that are attracted and managed by the mutual funds.

The procedure involves the quantification of the current level of the TNA variable which can be explained by its historical values. Then, is rather important to see if the adding variable x_{t-1} (i.e. GDP_{n-1}) may explain the increase of the variance.

Synthetically, the causality analysis between the two variables involves the following steps:

Analysis of causality between the two variables involves the following steps:

(1) in order to test whether 'the dynamics of the economic (GDP) is due to the evolution of the ATN (for the mutual funds)', we can estimate the regression equation:

$$TNA = a_0 + a_1*GDP_{n-1} + a2*TNA_{(n-1)/0} + \varepsilon_1 \quad (u)$$

$$TNA = a_0 + a_1*TNA_{(n-1)/0} + \varepsilon_1 \quad (r)$$

where:

TNA represents the total net assets;

GDP represents the gross domestic product;

ε1 - is the error term

For testing we use a Fisher-Snedecor test type constructed as follows:

$$F = \frac{(SSR_r - SSR_u)/k}{SSR_u/(T-2k-1)} = \frac{(R_u^2 - R_r^2)/k}{(1-R_u^2)/(n-2k-1)} \in F(k, n-2k-1)$$

where SSR_u and R_u^2 represent the sum of the squared residuals and the coefficient of determination in the unrestricted equation (u),

and SSR_r şi R_r^2 present the the same elements, but are defining the restricted regression equation (r), that includes only terms of *Yt-1* type.

The hypothesis 'the changes in GDP aren't the cause of the TNA variation' is rejected, if the calculated F (statistic F) is greater than the critical value.

(2) similarly, we test whether 'the changes in GDP are due to the dynamics of the TNA', following the regression:

$$GDP = b_0 + b_1*GDP_{n-1} + b_2*TNA_{(n-1)/0} + \varepsilon_2 \quad (u)$$

$$GDP_n = b_0 + b_1*GDP_{n-1} + \varepsilon_2 \quad (r)$$

where:

TNA represents the total net assets;

GDP represents the gross domestic product;

ε2 - is the error term

Next, we proceed to Fisher-Snedecor testing and rejecting the hypothesis that 'the ATN are not the cause of the GDP growth' if the calculated F test is greater than the critical values.

(3) After applying the two tests are possible four conclusions:

a. an unidirectional causality: the Δ TNA is the cause for ΔGDP (TNA => GDP) if the null hypothesis is rejected at (1) and accepted by (2);

b. an unidirectional causality: the ΔGDP causes the Δ TNA (GDP => TNA) where the null hypothesis is rejected at (2) and are allowed to (1);

c. a bidirectional causality: TNA ⇔ GDP, if the null hypothesis is rejected both at (1) and (2) regression;

d. the two variables are both independent, if the null hypothesis is accepted in (1) and (2) regression.

4. MAIN RESULT

4.1. TESTING FOR STATIONARITY. RESULTS OF THE UNIT ROOT TEST

4.1.1. Augmented Dickey-Fuller (ADF)

We run the ADF tests for stationarity under three hypotheses:

- the series are stationary at any levels – no unit root
- the series are stationary at differencing one – one unit root
- the series are stationary at differencing twice – two unit roots

As a result, the series of economic growth and total net assets for Romania do not have a unit root, so they are stationary and then run the co-integration tests.

Methodologically, in order to test stationary, the ADF test was applied on a single constant model since it is the most appropriate for showing that the chosen model has a insignificant probability of containing a trend.

By running the test we obtained the data presented in table 5.

Tabel 5. *ADF Statistics on TNA stationary*

Null Hypothesis: TNA has a unit root			
Exogenous: Constant			
Lag Length: 0 (Automatic - based on SIC, maxlag=10)			
		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.91941	0
Test critical values:	1% level	-3.55267	
	5% level	-2.91452	
	10% level	-2.59503	

Source: Own processing in Eviews

In order to test the stationary of series, the decision on the null hypothesis is taken by following:

- if $t_{calc} < t^*_{tab}$, then H0 is rejected, which means that the series has no unit root (the series are relatively stationary to the average, or it is a deterministic one);

- if $t_{calc} > t^*_{tab}$, then H0 is accepted, which means that the series has a unit root (is unsteady, and presents a stochastic trend).

Since the t-statistic (calculated value) is (-5.91941) less than the tabulated values and the significance level of the test

is 1% (or 0,001), it means that the null hypothesis is rejected, i.e. the series has no unit root – therefore the TNA series is a stationary series.

Similarly, the GDP stationary testing shows the results presented in table 6.

Tabel 6. *ADF Statistics on GDP stationary*

Null Hypothesis: GDP has a unit root			
Exogenous: Constant			
Lag Length: 3 (Automatic - based on SIC, maxlag=10)			
		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.45171	0.133
Test critical values:	1% level	-3.56002	
	5% level	-2.91765	
	10% level	-2.59669	

Source: Own processing in Eviews

For the GDP series, the t calculated value (-2.45171) is greater than the tabular values and it indicates that the series is non-stationary. But the significance level of the test exceeds 10% (0.133), thus it imposes the rejection of the null hypothesis, which means that the series has no unit root and therefore GDP series is a stationary series.

4.1.2. Kwiatkowski-Phillips-Schmidt-Shin (KPSS) unit root test

The KPSS statistic test is based on the Lagrange multiplier (LM) and the statistic score for testing the null hypothesis against the alternative:

$H_0 : \pm^2 = 0$ (the series are stationary)

$H_1 : \pm^2 > 0$ (the series has unit root)

The null hypothesis is rejected if the LM statistic is greater than the tabular ones. Also, we choose the bandwidth based on Newey-West criterion and using the Bartlett Kernel estimator.

By applying the test we obtained a LM statistic value less than the tabular value, therefore the null hypothesis is accepted, i.e. the TNA series is stationary.

Table 7. *KPSS Statistics on TNA stationary*

Null Hypothesis: TNA is stationary		
Exogenous: Constant		
Bandwidth: 2 (Newey-West automatic) using Bartlett kernel		
		LM-Stat.
Kwiatkowski-Phillips-Schmidt-Shin test statistic		0.076434
Asymptotic critical values*:	1% level	0.739
	5% level	0.463
	10% level	0.347

Source: Own processing in Eviews

Also, in the case of GDP series, the LM statistics confirms the ADF results and consequently the GDP series is stationary.

Table 8. *KPSS Statistics on GDP stationary*

Null Hypothesis: PIB is stationary		
Exogenous: Constant		
Bandwidth: 11 (Newey-West automatic) using Bartlett kernel		
		LM-Stat.
Kwiatkowski-Phillips-Schmidt-Shin test statistic		0.209509
Asymptotic critical values*:	1% level	0.739
	5% level	0.463
	10% level	0.347

Source: Own processing in Eviews

4.1.3. OLS Regression

We use a simple regression analysis which is found not to be spurious by the rule of thumb. We construct the first regression in order to test the impact of gross domestic product on total net assets, respectively the second regression to test the influence of TNA on GDP.

OLS Regressions:

$TNA = c_1+c_2*GDP+\varepsilon_t$ (1)

$GDP = c_1+c_2*TNA+\varepsilon_t$ (2)

First, we outlined a linear regression model in order to study the impact of the GDP on the dynamics of the TNA of the mutual funds in Romania during the analysed period. The regression results present a negative impact (the coefficient is -0.232740) between the variables TNA = f (GDP). But, since the probability of 11.92% is insignificant (significance threshold exceeds 10%), we cannot appreciate that the independent variable (i.e. GDP) has a certain influence on the dependent variable dynamics (i.e. TNA).

Table 9. *OLS Regression on TNA*

Dependent Variable: TNA
Method: Least Squares
Date: 05/19/13 Time: 23:19
Sample: 1 57
Included observations: 57

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.399011	0.159946	8.746790	0.0000
GDP	-0.232740	0.147054	-1.582681	0.1192

R-squared	0.043559	Mean dependent var	1.152289
Adjusted R-squared	0.026170	S.D. dependent var	0.273869
S.E. of regression	0.270262	Akaike info criterion	0.255604
Sum squared resid	4.017272	Schwarz criterion	0.327290
Log likelihood	-5.284726	Hannan-Quinn criter.	0.283464
F-statistic	2.504878	Durbin-Watson stat	1.166973
Prob(F-statistic)	0.119228		

Source: Own processing in Eviews

Secondly, we developed a linear regression in order to test the impact of the TNA on the GDP dynamics. Also, in this case, there is a negative relation between the variables (the coefficient value is -0.187159), but with a insignificant value, while its probability (11,92%) exceeds the significance level of 10%. Therefore, neither the TNA doesn't influence the GDP.

Table 10. *OLS Regression on GDP*

Dependent Variable: GDP
Method: Least Squares
Date: 05/19/13 Time: 23:21
Sample: 1 57
Included observations: 57

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.275736	0.139994	9.112816	0.0000
TNA	-0.187159	0.118255	-1.582681	0.1192

R-squared	0.043559	Mean dependent var	1.060074
Adjusted R-squared	0.026170	S.D. dependent var	0.245591
S.E. of regression	0.242356	Akaike info criterion	0.037643
Sum squared resid	3.230516	Schwarz criterion	0.109329
Log likelihood	0.927169	Hannan-Quinn criter.	0.065503
F-statistic	2.504878	Durbin-Watson stat	2.459617
Prob(F-statistic)	0.119228		

Source: Own processing in Eviews

Synthetically, the results of the simple regression analysis are presented in table 11 as follow:

Table 11. *Ordinary least squares regressions*:

	(1)	**(2)**
C	1.399011*** (8.74679)	1.275736*** (9.112816)
GDP	-0.23274 (-1.582681)	
TNA		-0.187159 (-1.582681)
R-squared	0.043559	0.043559

Source: Own processing in Eviews
Note: In parenthesis are the t-statistic values.
*** represents 1% significance level

In summary, the results of our regressions show that the influence of both variables is negative and not significant. In other words, GDP does not influence TNA, and TNA does not have an impact on GDP. This situation could be slightly predicted since the Romanian TNA of the mutual fund industry comprises a small amount of capital among the national incomes (GDP), moreover this vehicle of investments haven't have a wide publicity among all types of investors, being only promoted among institutional investors.

4.2. TESTING FOR CO-INTEGRATION. RESULTS OF THE JOHANSEN CO-INTEGRATION TEST

Johansen co-integration test reveals that at 5% level of significance at using six lags, we do not have pairs of co-integration among the variables. This verifies the fact that when the time series are co-integrated, there must be either bi-directional or unidirectional Granger causality between them.

Tabel 12. *JOHANSEN co-integration test between TNA and GDP*

Unrestricted Cointegration Rank Test (Trace)				
Hypothesized No. of CE(s)	Eigen value	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.287169	21.10311	15.49471	0.0064
At most 1 *	0.080156	4.177546	3.841466	0.041
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)	Eigen value	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.287169	16.92556	14.2646	0.0185
At most 1 *	0.080156	4.177546	3.841466	0.041
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				

Tabel 13: *JOHANSEN co-integration test between GDP andTNA*

Unrestricted Cointegration Rank Test (Trace)				
Hypothesized No. of CE(s)	Eigen value	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.664142	83.11323	15.4947	0
At most 1 *	0.343008	23.1046	3.84147	0
Trace test indicates 2 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)	Eigen value	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.664142	60.00863	14.2646	0
At most 1 *	0.343008	23.1046	3.84147	0
Max-eigenvalue test indicates 2 cointegrating eqn(s) at the 0.05 level				
* denotes rejection of the hypothesis at the 0.05 level				
**MacKinnon-Haug-Michelis (1999) p-values				

4.3. TESTING FOR CAUSALITY. RESULTS OF GRANGER CAUSALITY TEST

Using the R application for the Granger causality test, it leads us to detach the following conclusions:

-there is no stable relationship between the GDP and the TNA;

-there is no causal relationship, therefore both variables are independent, except the case of the one lag test(for GDP) and 6 lags (for AT).

Table 14. *R Statistics on Granger test of causality*

	L=no of lags	F-statistic	p-value
GDP does not Granger cause TNA	1	0	0.9969
GDP does not Granger cause TNA	2	0.1975	0.8215
GDP does not Granger cause TNA	3	1.4677	0.2354
GDP does not Granger cause TNA	4	1.2843	0.2907
GDP does not Granger cause TNA	5	0.9767	0.4434
GDP does not Granger cause TNA	6	1.2974	0.2819
TNA does not Granger cause GDP	1	2.179	0.1458
TNA does not Granger cause GDP	2	1.3896	0.2586
TNA does not Granger cause GDP	3	0.9738	0.4131
TNA does not Granger cause GDP	4	1.7864	0.1487
TNA does not Granger cause GDP	5	1.8003	0.1342
TNA does not Granger cause GDP	6	2.0606	0.0811

Source: R Statistics 2012

5. Final remarks

In this study, Granger causality test was applied in order to determine the presence of the relationship between two variables (economic growth and mutual fund investments development) and its direction in Romanian economy between 1998 Q2 and 2012 Q2.

The findings of this study provide two major contributions. First, it presents an investigation on the relationship between the GDP growth and the mutual funds development using the co-integration and causality tests, which allows us for identifying any interdependencies among the variables and their changing effects. Secondly, it provides a systematic and comprehensive model for testing the causality among different other economic variables, becoming an appropriate research for developing the existing economic literature.

According to the results of the study, there is no reciprocal causality relationship between economic growth and the mutual fund investments development in Romania. In other words, mutual fund investments in Romania are one of the factors affecting economic growth; however, the high or low economic growth rate does not have an effect on the

presence of mutual fund investments in Romania. As a result, it is necessary to continue to encourage investment inflows in order to obtain a significant impact on the economic growth in Romania.

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References

[1] AbuAl-Foul B. (2010) – The causal relation between savings and economic growth. Some evidence from MENA countries, *The 30th MENA Meeting Atlanta, Jan. 2010*

[2] Afşar M.(2008) - The Causality Relationship Between Economic Growth And Foreign Direct Investment In Turkey, Sosyal Bilimler Enstitusu, Selcuk Universitesi Turkey, available online at http://www.sosyalbil.selcuk.edu.tr/sos_mak/articles/2008/20/MAVSAR.PDF

[3] Andrei T., Bourbonais R. (2008) – *Econometrie*, Editura Economica, Bucuresti, 2008

[4] Anghelache G. (2000) – *Bursa şi piaţa extrabursieră*, Editura Economică, Bucureşti, 2000

[5] Awe O.O. (2012) – On pairwise Granger causality modeling and econometric analysis of selected economic indicators, Available at http://interstat.statjournals.net/YEAR/2012/articles/1208002.pdf

[6] Babin C:E., Donovan W.J. (2000) – *Investing secrets of the matters. Applying Classical Investment Ideas to Today's Turbulent Market*, Editura McGrawHill, SUA

[7] Bahadur G.C.S., Neupane S. (2006) – Stock market and Economic development – a causality test, *The Journal of Nepalese Business Studies Vol III. no.1*, dec.2006

[8] Bajo-Rubio O., Montero-Munoz M. (1999) - Foreign Direct Investment And Trade: A Causality Analysis, Universidad Pública de Navarra, Available at: ftp://ftp.econ.unavarra.es/DocumentosTrab/DT9902.PDF

[9] Barna F. (2004) – *Piata de capital. Analize si strategii investitionale*, Editura Universitatii de Vest, Timisoara, 2004

[10] Diaconiţa M. (2003) – TD. *Tendinţe actuale în orientarea şi diversificarea plasamentelor de capital*, cond. Basno C., ASE Bucureşti

[11] Egbo O., Onwumere Josaphat U. J.and Godwin Chigozie Okpara (2011) - Foreign Direct Investment And Economic Growth In Nigeria: A Granger Causality Analysis, *International Journal of Current Research, Vol. 3, Issue, 11*, pp.225-232, October, 2011, Available online at http://www.journalcra.com/sites/default/files/Download%201064.pdf

[12] Frimpong J.M., Oteng-Abayie E.F. (2006) – Bivariate causality analysis between FDI inflows and economic growth in Ghana, *Munchen University, MPRA Paper No. 351*, posted on the 10th of October 2006, Online at http://mpra.ub.uni-muenchen.de/351/

[13] Kholdy S., Sohrabian A. (2005) - Financial Markets, FDI, and Economic Growth: Granger Causality Tests in Panel Data Model, EFA 2005 Moscow Meetings. Available at SSRN: http://ssrn.com/abstract=676085 or http://dx.doi.org/10.2139/ssrn.676085

[14] Moudatsou A., Kyrkilis D. (2008) - FDI and ECONOMIC GROWTH: Granger Causality Tests in Panel Data Model-Comparative results in the case of European Union countries EU (European Union countries) and ASEAN Association of South East Asian Nations, *EEFS2008-CONFERENCE*, June 2009-Warsaw-Poland

[15] Pecican E.(2007) – *Econometria pentru economisti*, Editura Economica, Bucuresti, 2007

[16] Radu I. (2011) – Phd. Research Study *Piaţa fondurilor de investiţii – studiu comparative*

[17] Radu I., Nistor I. A. and Ciupac-Ulici M.-L. (2012) – 'Main Determinants Of The Mutual Funds Dynamics In Romania Before And After The Financial Crisis', *The International Conference „Global Economy under Crisis"*, Annals of Ovidius University of Constanta, Economic Sciences Series, 2012 vol XII issue 2. p. 1347

[18] Radu I., Sava C. (2012) – ,Driving Economic Growth Troughout Promoting The Investments In Mutual Funds Industry' *The International Conference „Global Economy under Crisis*, Annals of Ovidius University of Constanta, Economic Sciences Series, 2012 vol XII issue 2, p.1341

[19] Sava C., Radu I. (2012) - The Attractiveness of Harmonized Investment Funds - Evidence on Romanian Investment Fund Market, Annals of Ovidius University of Constanta, Economic Sciences Series, 2012 vol XII issue 1, p.1660

[20] Shaikh F.M. (2010) – Causality relationship between foreign direct investments, trade and economic growth in Pakistan, *International Conference on Applied Economics*, ICOAE 2010, p.717-722