

**Nonlinear Diachronic Relationships between Financial Newspapers  
Circulations and the General Index of the Athens Stocks Exchange.**

*Maria Kalpouzani.*

**&**

*Dikaïos Tserkezos\**

*Department of Economics,*

*University of Crete*

*University Campus*

*Rethymno 74100, Greece*

**Abstract.**

This paper investigates the existence of any linear or non-linear diachronic relationship between the financial newspapers circulations and the General Index of the Athens Stocks Exchange (ASE). We employed a nonlinear version of the Hsiao's (1979) linear causality technique in order to test and detect the direction of any possible linear or non-linear causality between these variables. Using daily data of the period 2003-2007 we identified non-linear bi-directional causality between the financial newspapers circulations and the General Index of the Athens Stocks Exchange (ASE).

**JEL** Classification: F17, F21

**Keywords:** Financial newspapers circulations, Athens Stocks Exchange General Index, Non-linear Causality, Diachronic Impulse Response Functions.

---

\* Corresponding author: Department of Economics, University of Crete, University Campus, Rethymno 74100, Greece. Tel: +302831077415, fax: +302831077415, e-mail: [tserkez@econ.soc.uoc.gr](mailto:tserkez@econ.soc.uoc.gr) . .

## 1. Introduction.

In this paper we explore the nonlinear diachronic relationship between the financial newspapers circulations and the General Index of the Athens Stocks Exchange (ASE). Using daily data for the last six years and nonlinear cointegration and causality techniques we were unable to identify any stable long run co movements between these two variables. We also verified nonlinear short run diachronic interactions between the financial newspapers circulation and the returns of the Athens Stocks Exchange General Index. We schedule these diachronic interactions and compare the diachronic effects between these variables at different time periods in the whole estimation period<sup>1</sup>. These findings could raise doubts for the efficiency of the Greek stock market and might have some positive implications for investors with respect to decisions regarding entering or exiting the market or investment strategies taking into account the diachronic behaviour of the financial newspapers circulations.

The literature that investigates the nature of the causal relationship between financial newspapers circulations and the returns of the Athens Stocks Exchange General Index is not extensive at all. We could not find any reference<sup>2</sup> which deal with the same problem and the same methodological tools we use in this paper.

An interesting and quite recent work which is related, at least methodologically to our work is an unpublished CEPR Discussion Paper (No. 5912) of Argentesi E, Motta M. and Luetkepohl H., (2007). Using monthly data for the Italian economy for the period 1978-2003, these authors verified stable linear co movements between the financial newspapers circulation and the returns of the general index of the Italian Stocks Exchange market. In addition they trace a linear

---

<sup>1</sup> We also test the predictive power of the estimated nonlinear autoregressive model between the change of the financial newspapers circulation and the returns of the Athens Stocks Exchange General Index. These results are available by request at [dtsek@tellas.gr](mailto:dtsek@tellas.gr)

<sup>2</sup> The last years there is a long body of reports in daily newspapers and some books about the newspapers circulations which is mainly a diachronic analysis and in general some opinions for the future trends of the newspapers circulations in Greece. Exception is a working paper of Tserkezos and Mandidakis (2007), which using causality techniques analyze the effects of weather variables on the circulations of political newspapers circulations.

causality effect running from the general index to the financial newspapers circulation but not the opposite.

Another interesting work is the paper of Dyck A and Zingales L. (2003) where the possible feedback between the 'media cover' of the stocks exchange market developments and the prices of stocks is analyzed. According to their results these researchers trace an effect running from the 'media cover' to the prices of stocks in the exchange market. Barber, Lehavy, McNichols, and Trueman, (2001), Bjerring, J, Lakonishok and Vermaelen, (1983) and Canes and Lloyd-Davies(1978) investigate the role of buy and sell recommendations on the variability of stocks returns. According to their results the buy and sell recommendations effects positively or negatively the returns and specially the abnormal returns and abnormal volumes. In this body of studies we may include the works of Liu et all (1990), Beneish (1991), Palmon et all, (1994), Mathus and Wahead(1995), Bolstar and Thahan (1995), Sant and Zaman (1996), Ferreira and Smith (1999), Liang (1999) ,Muratoglou and Yazici(2002) and Kiyamat(2002). Liu, P., Smith D., and Syed A., (1990) analysed the effects of newspaper comments for some stocks in some Wall Street journals as the: Texas Journal, Florida Journal, Southeast Journal, Wall Street Journal/California, και New England Journal. Basic result of their analysis is that: 'articles in regional publications have a statistically significant impact on stock prices on the day of publication'.

In brief, the empirical evidence indicates that there is a conflict about the existence of linear bi-directional causality between financial newspapers circulations and the returns of Stocks Exchange Markets. The possibility of nonlinear bi-directional causality between financial newspapers circulations and the developments of stocks markets is for the first time investigated.

In this paper using daily data available from 2003 to 2007 and a modified version of the Hsiao's (1981) linear causality method we investigate if there exists any linear or non-linear diachronic relationship between financial newspapers circulations and the Athens Stocks Exchange General Index. According to our knowledge, no other similar study for the case of Greece exists in the literature(psychogios 1992,2008 and Leandros 1992). Our results confirm the existence of a non-linear diachronic relationship between financial newspapers circulations and the Athens Stocks Exchange General Index.

The rest of the paper is organized as follows. Section 2 presents the methodology utilized in the present paper. Section 3 describes the data and analyses the empirical results. Section 4 contains some concluding remarks.

## 2. The NonLinear Causality Methodology.

This section outlines the methodology that we employed, in order to examine the possibility of linear or nonlinear casual relationships between financial newspapers circulation and the returns of the Athens Stocks Exchange General Index. Since our primary target is the non-linear causality, we utilized a modified version of the Hsiao (1987, 1981) linear causality test, based on a Box-Cox transformation<sup>3</sup>. This test is based on a bivariate VAR representation for two stationary series  $x_t$  and  $y_t$ , which is the following:

$$x(\lambda)_t = a_0 + \sum_{i=1}^{n_1} a_i x(\lambda)_{t-i} + \sum_{j=1}^{q_1} \beta_j y(\lambda)_{t-j} + \varepsilon_{x,t} \quad (1)$$

$$y(\lambda)_t = \beta_0 + \sum_{i=1}^{n_2} a_i x(\lambda)_{t-i} + \sum_{j=1}^{q_2} \beta_j y(\lambda)_{t-j} + \varepsilon_{y,t} \quad (2)$$

where  $x(\lambda)_t = \frac{x_t^\lambda - 1}{\lambda}$ ,  $y(\lambda)_t = \frac{y_t^\lambda - 1}{\lambda}$  and  $\lambda \in (0,1)$ . Since  $x_t$  and  $y_t$  are stationary variables, it follows that  $x_t(\lambda)$  and  $y_t(\lambda)$  are also stationary variables. In these Granger causality type tests, the null hypothesis that  $y_t(\lambda)$  does not cause  $x_t(\lambda)$  in equation (1) is  $H_0 : \beta_1 = \dots = \beta_q = 0$  and the alternative hypothesis is  $H_1 : \beta_j \neq 0$  for at least one  $j$ . Similarly we test if  $x_t(\lambda)$  does not cause  $y_t(\lambda)$  in equation (2). The test statistic for the above test has a standard  $F$ -distribution with  $(n, T - n - q - 1)$  degrees of freedom, where  $T$  is the number of observations. In order to select the appropriate lag length for both  $x_t(\lambda)$  and  $y_t(\lambda)$ , we employed the Akaike's Final Prediction Error (FPE) criterion.

---

<sup>3</sup> Box, G.E.P., Cox, D.R., 1964.

Following Hsiao (1981), we employed a sequential procedure for testing non-linear causality, for different values of the parameter  $\lambda$ . This procedure combines the FPE criterion with the definition of Granger causality. More analytically, to test for causality from  $y_t(\lambda)$  to  $x_t(\lambda)$  in equation (1), we proceed sequentially: First, we treat  $x_t(\lambda)$  as a one-dimensional process with  $\beta_j = 0$  for each  $j$ , and compute its FPE with  $n$  varying from one to the maximum number of lags. Then we choose the number of lags that gives the smallest FPE, which is denoted as  $FPE[x(n,0)]$ . Second, we treat  $x_t(\lambda)$  as a controlled variable, with the number of lags that were chosen in the first step, and we compute the FPE of equation (1) with  $q$  varying from one to the maximum number of lags. Again, we choose the number of lags of  $y_t(\lambda)$  that gives the smallest FPE, which is the true minimum FPE of equation (1) and denoted as  $FPE[x(n,q)]$ . Third, we compare  $FPE[x(n,0)]$  with  $FPE[x(n,q)]$ . If the former is greater than the latter, then we conclude that  $y_t(\lambda)$  causes  $x_t(\lambda)$ . The same procedure is used if we want to test for causality from  $x_t(\lambda)$  to  $y_t(\lambda)$  in equation (2).

### 3. Data and Empirical results.

The data used in this paper refer to daily<sup>4</sup> data of the General Index of the Athens Stocks Exchange (ASE) and the circulations<sup>5</sup> of the daily financial newspapers in Greece. We refer for daily data covering the period 2003-2007. Sources of our data are the Athens Stocks Exchange Market ([www.ase.gr](http://www.ase.gr)) and the Athens Daily Newspaper Publishers Association (EIHEA) ([www.eihea.gr](http://www.eihea.gr)).

The circulations of the Greek financial newspapers used in this paper refers to the following<sup>6</sup> newspapers: ‘Hmerisia’, ‘Xrhmatistirio’, ‘Express’ ‘Nautemporiki’ and ‘Kerdos’. Figure 1 presents the diachronic behavior of the financial newspapers circulations<sup>7</sup> and the daily prices of the Athens Stocks Exchange Index.

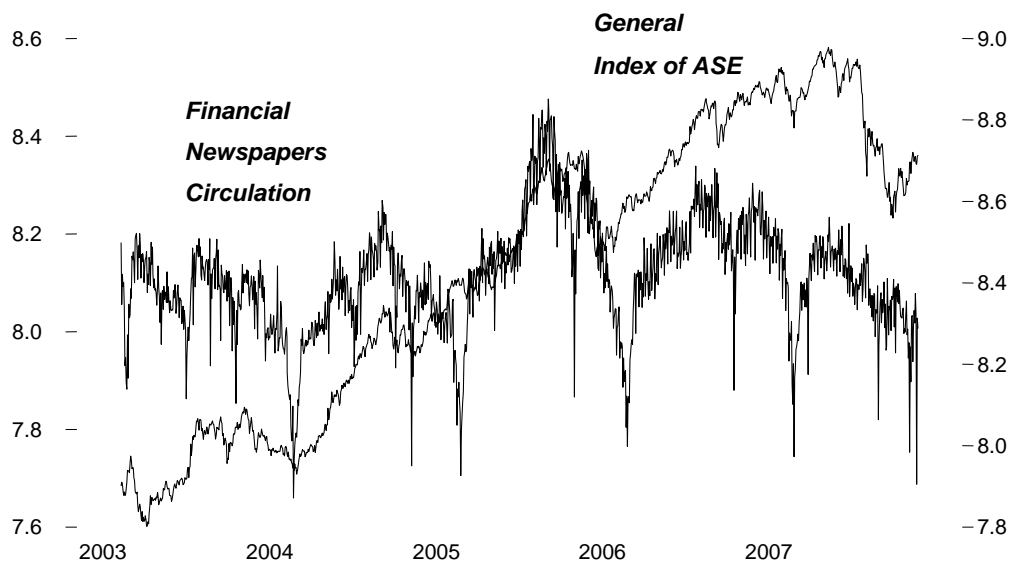
---

<sup>4</sup> Another representative variable to approach the developments of the Athens stocks exchange market could be the traded volumes that correspond to the General Index, and even more the number of the traded items. Although this variable is available we decided after some preliminary analysis to use this variable in the future work and instead the traded volumes of the general index, to use the number of items traded as a percentage of the total number of available items for each stock participating in the General Index of ASE. Hopefully this will happen in the near future since the creation of a new weighted variable with the traded volumes could contribute even more to the understanding of any link could connect the circulations of the financial newspapers and the General Index of the Athens Stocks Exchange.

<sup>5</sup> The total number of circulations refers to sum of the financial newspapers circulations. Of the 17 financial newspapers circulated the last years, several stopped their traffic while the others available on a weekly basis were not used in this work. The financial newspapers circulated in the market the more recent years are the following: “Financial Box”, “Money”, “Diktis Aksiwn”, “Diktis gia tin ikonomia”, “Eksipno Xrima”, “Express”, “Naftemporiki”, “Ependitis”, “Evrooikonomia,” “Axia”, “Isotimia”, “Kerdos”, “Metoxos”, “O kosmos tou Ependiti”, “Oikonomia”, “To Xrimatistirio”, ‘Hmerisia’ and “Simvoulos”. More information is available on: Center for Mass Media(2007).

<sup>6</sup> In the total number of financial newspapers circulations there are not included Saturday and Sunday circulations because the ASE operates on five-day basis. Although in this paper what is matter is related with the variability of the newspaper circulations and the Athens Stocks Exchange Index, the use of weekly or even monthly data could be an interesting alternative instead the possible temporal aggregation problems. We hope that this will be done in the near future.

<sup>7</sup> It should be noted that the available data used in this work concerning circulations provided by the the Athens Daily Newspaper Publishers Association (EIHEA). Of course everyone knows that many



**Figure 1.** ASE General Index and the Financial Newspapers Circulations in Greece.

Before proceeding with the nonlinear VAR causality analysis, we tested<sup>8</sup> each of our two time series for unit root, using the Augmented Dickey-Fuller (ADF) test (Dickey and Fuller W.A 1979,1981) , and the Phillips-Perron (PP) tests<sup>9</sup>( Phillips and Perron. 1988). To select the appropriate lag length for the ADF test regression, we used the Akaike's information criterion. Some results are presented on Table 2 in the Appendix. These stationarity tests suggest that the Athens Stocks Exchange Index is a I(1) variable and the financial newspapers circulations can be classified as a stationary time series.

---

of the newspapers distribute a large number of leaves, how many unknown, themselves to their subscribers. We hope that this development will not affect the reliability of our results.

<sup>8</sup> We also used the Engle-Granger(1987) cointegration methodology in order to investigate if there exists any stable long-run relationship between financial newspapers circulations and the Athens Stocks Exchange General Index. Our results indicated no evidence of cointegration. These results are not presented here but are available upon request.

<sup>9</sup> We also applied and the KPSS (Kwiatkowski, Phillips, Schmidt and Shin, 1992) test with similar results. More information is available on request.



Table 1 presents the results obtained applying the linear<sup>10</sup> and nonlinear causality tests, based on the stochastic equations (1) and (2).

**Table 1.** Linear and non Linear causality tests between the financial newspapers circulations and the Athens Stocks Exchange General Index.

	<i>General Index of ASE</i>	<i>Financial Newspapers Circulation</i>
<i>Linear Causality</i>		
<i>General Index of ASE</i>	$\frac{FPE^{(y)}(m, * 0)}{FPE^{(y,x)}(m^*, n^*)} = 0.99786$	$\frac{FPE^{(x)}(\xi, * 0)}{FPE^{(x,y)}(\xi^*, \kappa^*)} = 1.1565$
<i>NonLinear Causality</i>		
<i>Financial Newspapers Circulations</i>	$\frac{FPE^{(y,\lambda=.78)}(m, * 0)}{FPE^{(y,x,\lambda=.78)}(m^*, n^*)} = 1.0675$	$\frac{FPE^{(x,\lambda=.78)}(\xi, * 0)}{FPE^{(x,y,\lambda=.78)}(\xi^*, \kappa^*)} = 1.0293$

**Source:** Our estimates.(The estimated numbers of the distributed lags for the nonlinear case ,are the following: m=1, n=4,  $\xi=4$ ,  $\kappa=4$ .)

According to the results of Table 1 and the causality methodology presented in section 2, we may conclude the following:

$$FPE^{(y)}(m, * 0) \leq FPE^{(y,x)}(m^*, n^*) \quad (3)$$

$$FPE^{(x)}(\xi, * 0) \geq FPE^{(x,y)}(\xi^*, \kappa^*) \quad (4)$$

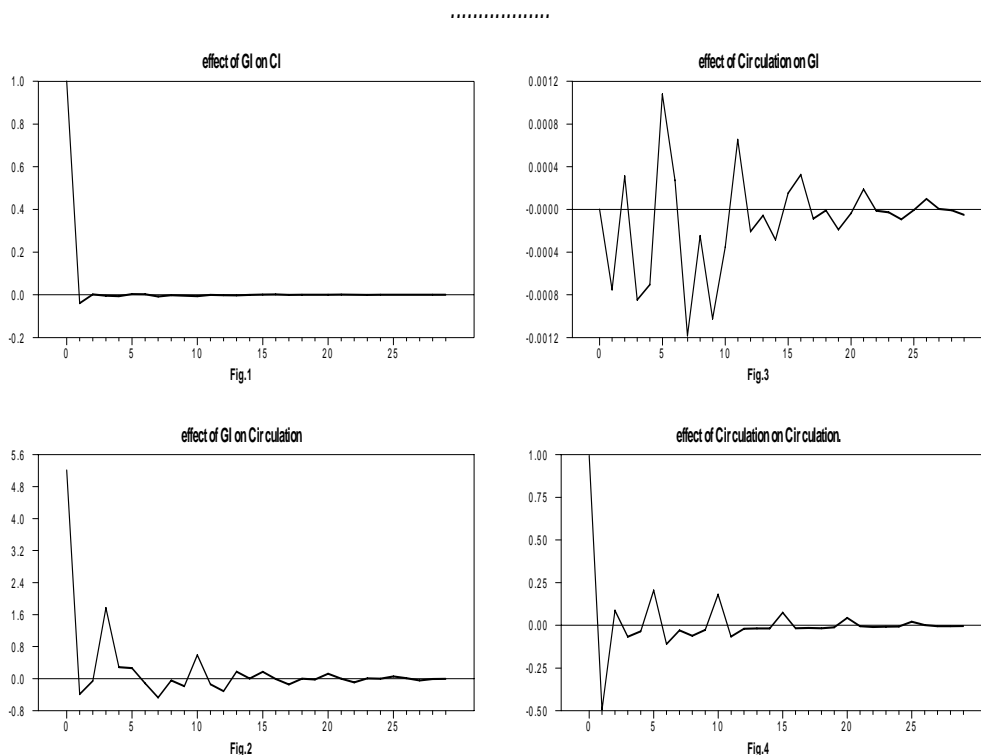
$$FPE^{(y(\lambda=.78))}(m, * 0) \geq FPE^{(y(\lambda=.78),x(\lambda=.78))}(m^*, n^*) \quad (5)$$

$$FPE^{(x(\lambda=.78))}(\xi, * 0) \geq FPE^{(x(\lambda=.78),y(\lambda=.78))}(\xi^*, \kappa^*) \quad (6)$$

The above results (relations 3-6) confirm the existence of the diachronic feedback between financial newspapers circulations and the Athens Stocks Exchange General Index. Figure 2 presents the impulse responses between economic newspaper circulations and the returns of the Athens Stocks Exchange General Index. These impulses responses were estimated using the results for testing for non-linear causality of Table 1.

<sup>10</sup> For the linear causality tests we assume  $\lambda=1$  in the stochastic equations (1) and (2).

## Diachronic NonLinear Interactions Between GI and Circulation

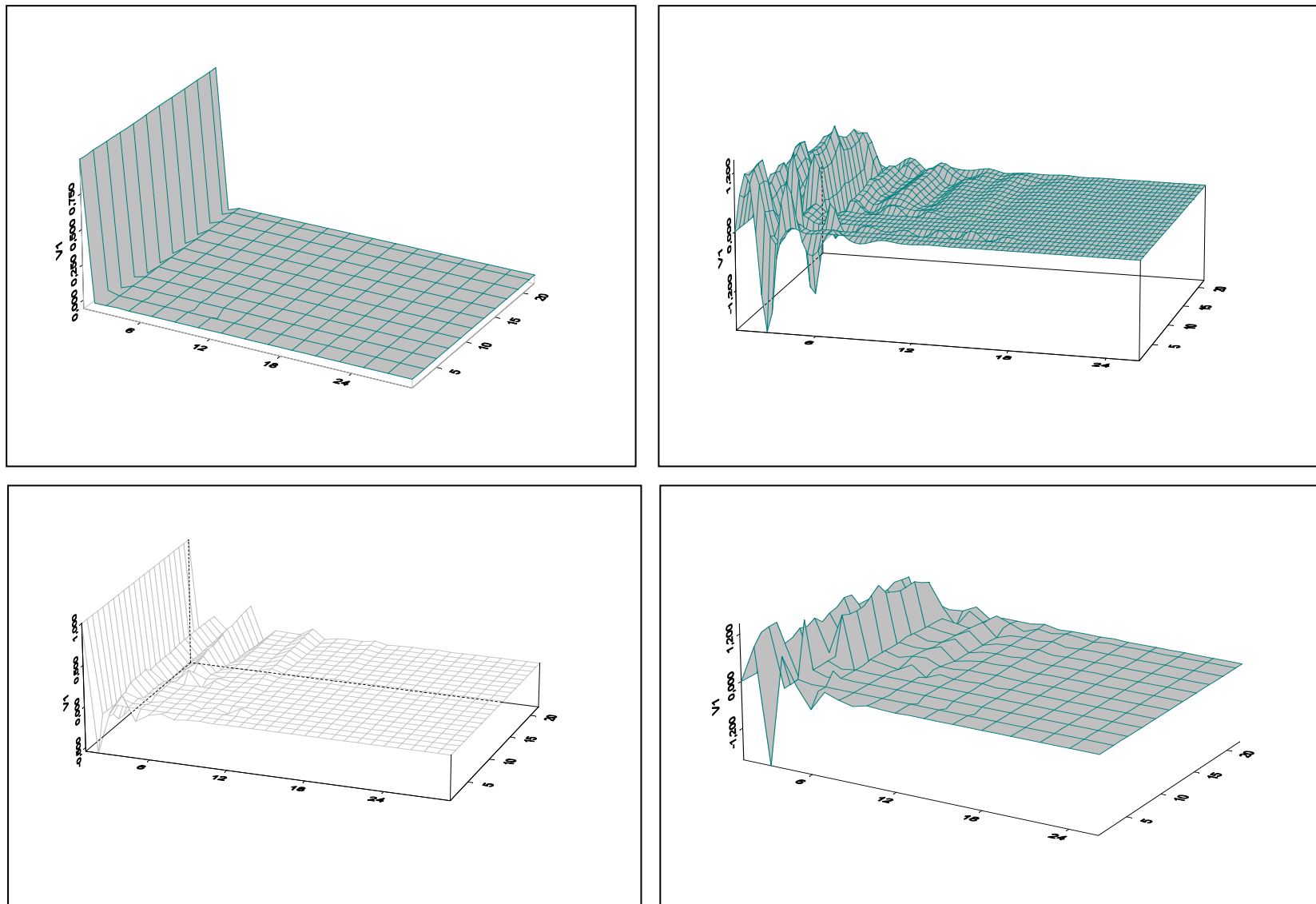


**Figure 2:** Non-linear impulse responses between the General Index and the circulation of the financial newspapers in Greece.

Finally in Figure 3 we present the three dimensions<sup>11</sup> ‘no linear’ diachronic effects between the returns of the General Index and the changes in the circulation of the economic newspapers in Greece. The third dimension in this figure is the time. The results compared with those of Figure 1 are very similar, giving another one confirmation of the stable short run diachronic interactions between these variables.

---

<sup>11</sup> The results of this three dimensions figure are based on the results similar to Figure 1, estimating the equations (1) and (2) and obtaining the impulse responses at different time periods within the estimation sample period.



**Figure 3.** Non-linear diachronic impulse responses between the General Index and the circulation of the financial newspapers Greece.

#### 4. Concluding Remarks

In this paper we investigated the diachronic causal relationship between financial newspapers circulation and the returns of the Athens Stocks Exchange General Index. We used a linear VAR approach together with a Box-Cox transformation in the variables, in order to capture any non-linear effects. In general, our results indicate bidirectional non-linear causality between these two variables.

This non-linear diachronic feedback between the financial newspapers circulations<sup>12</sup> and the developments of the Athens Stocks Exchange General Index is closely related to the steps the Athens stocks exchange market followed this period. We must not forget that this period is a period after a big crisis in the Athens Stocks Exchange Market where a lot of investors lost a big part of their money, investing in overestimated in their fundamentals stocks without the essential intervention of Athens Stock Exchange authorities. To our opinion, this is one from the main reasons that we trace this nonlinear feedback between the financial newspapers circulations and the Athens Stocks Exchange General Index. The investors in order to have a continues and objective information, they turned to the financial newspapers<sup>13</sup> that are specialised in the developments of the Athens Stocks Exchange market. Basic result of this development is the role of financial newspapers to be strengthened in an attempt of regularisation of Athens Stocks Exchange developments.

Of course one interesting question is why this feedback between the financial newspapers circulations and the returns of the Athens Stocks Exchange General Index is a nonlinear one. To our opinion this nonlinearity is related with the

---

<sup>12</sup> Given that about 50% of the total Athens Stocks Exchange valuation belongs to foreign investors, someone can match against that these investors do not read Greek language newspapers in order to take into account their information in their investments plans. To our opinion their sources and advisors in Greece read Greek finance newspapers and a lot of finance foreign newspapers use as basic sources selected information of the Greek newspapers about the developments in the Athens Stocks Exchange market. Finally a lot of these 'foreign investors' are Greek nationality who, for tax mainly reasons, prefer to invest in the Athens Stocks Exchange market from the foreigner.

<sup>13</sup> Some times buying more than one newspaper in order to have a spherical information about the developments of the Athens Stocks Exchange market.

fact that this period, is a period for investigation of the investors for the future of the Athens Stock Market and we could say that exist still a nervousness among the investors and perhaps and mistrust for the future developments in the market. We hope that in the near future with the regulation in the developments in the Athens Stocks Exchange market this feedback will still exists but in a 'linear manner'.

The results of our work in no case are in contradiction with recent works that use similar data and methodology. Any differentiation with the work of Argentesi E, Motta M and Luetkepohl X., (2007) and particularly for the existence of long-run diachronic comovements between the circulations of financial newspapers and the developments Stocks Exchange markets, it could be justified from the frequency of the data used (daily against monthly data), the different number of used years but also in the differentiations between the two stocks markets. The most important result of the two papers is that at least there exists a statistically confirmed effect of the developments of Stocks Exchange markets to the financial newspapers circulations.

Finally in the near future we are going to extend our empirical work in order to take into account the traded volumes of the General index and to extend our analysis to take account the possible causality effects in the variability of the financial newspaper circulations and the returns of the Athens Stocks Exchange General Index.

## Appendix.

*Table 2* . Unit root tests.

Μεταβλητές	Level		First difference		Critical Values		
	DF	PP	DF	PP	1%	5%	10%
ASE General Index	-1.4819[2]	-1.7732	-23.0581[1]	-38.571	-3.43	-2.86	-2.568
Newspapers Circulations	-3.5666[5]	-5.3347	-----	-----	-3.43	-2.86	-2.568

**Source:** Estimates, DF and PP are the Dickey - Fuller and Phillips - Perron stationarity tests respectively. The PP test was having assumed a time lag of three. The choice of time lags based on the criterion of the Akaike information Criterion. The critical values for testing stationarity are -3.43, -2.86 and -2.568 at 1% , 5% and 10% and number of observations T = 2200 (MacKinnon 1991, 1996).

## References.

- Akaike, Hirotugu., 1969, 'Fitting autoregressive models for prediction' *Annals of the Institute of Statistical Mathematics* 21, 243-247.
- Akaike Hirotugu. 1973. 'A new look at the Statistical Model Selection.' IEE Transactions on Automatic Control, 19, σελ. 716 -723.
- Argentesi E, Motta M. και Luetkepohl H., (2007) CEPR Discussion Paper (No. 5912).
- Barber, B M., Lehavy R , McNichols M , and Trueman B. 2001, Security analyst recommendations and stock re-turns, *Journal of Finance*, 56, 533-563
- Beneish M B, (1991), Stock Prices and the Dissemination .of Analysts Recommendations.*Journal of Business* 64(3).,393-416
- Bjerring, J. H., J. Lakonishok and T. Vermaelen, 1983, Stock prices and financial analysts recommendations, *Journal of Finance* 38, 187-204.
- Bolstar P J and Thahan E. A (1995), The Impact of Barron's Recommendations on Stock Prices., *Quarterly Journal of Business and Economics.*,34(4), 3-15.
- Box, G.E.P., Cox, D.R., 1964. An analysis of transformations. *J. Roy. Statist. Soc. Ser. B* 26, pp.211–243.
- Box, G.E.P. & Pierce A.D.A ., 1970. Distributions of Residual Autocorrelation in ARMA time Series.,*Journal of the American Statistical Association* 65.,pp1509-26.
- Ferreira and Smith (1999), Stock Prices reactions to Recommendations in the wall Street Journal 'Small Stock Focus' Column., *Quarterly Review of Economics and Finance.*,39, 379-389.
- Gamaletzos Theodore, 1995, 'An Introduction to Econometric Analysis'. Karabelopoulos Publishing, Piraeus Greece..
- Canes M and P.Lloyd-Davies(1978)., Stock Prices and the Publications of Second Hand Information. *Journal of Business* 51(1)., 43-56.
- Dickey,D.A and Fuller, W.A (1979)., Distributions of the estimators for autoregressive time series with a unit root. *Journal of American Statistical Association.* 74. 427-431
- Dickey,D.A and Fuller, W.A (1981)., Likelihood ratio statistics for autoregressive time series with a unit root. *Econometrica.* 49. 1057-1072.

- Dyck A and Zingales L., 2003., *The Media and Asset Prices.*, California Institute of Technology., mimeo.
- Granger, C.W.J. (1969) Investigating casual relations by econometric models and cross-spectral models. *Econometrica*. 37. 424-438.
- Granger, C.W.J ,1988., Some recent developments in a concept of causality, *Journal of Econometrics* 39 (1988), pp. 199–211.
- Engle, R.F. and Granger, C.W.J (1987) Cointegration and error correction: Representation, estimation and testing. *Econometrica*. 55. 251-276.
- Engle, R.F. and Yoo, B.S (1987) Forecasting and testing cointegrated systems. *Journal of Econometrics*. 35. 145-159.
- Hurvich, C. M. and Tsai, C. 1993, "A Corrected Akaike Information Criterion for Vector Autoregressive Model Selection," *Journal of Time Series Analysis*, 14, 271 - 279.
- Hannan, E. J. and Quinn, B. G., 1979 "The determination of the order of an autoregressive", *Journal of the Royal Statistical Society*, B41, 190–5.
- Hiemstra, Craig and Jonathan Jones., 1994. "Testing for linear and nonlinear Granger Causality in the Stock Price-Volume Relation." *Journal of Finance* 5: 1639-1664.
- Hsiao, Cheng. (1981)., "Autoregressive Modelling and Money-Income Causal Detection." *Journal of Monetary Economics*, σελ. 7: 85-106.
- Center for Mass Media 2007., *Research for the Mass Media in Greece*. Athens 2007.
- Kiyamaz H. (2002), *The Stock Market rumours and the stock prices: A test of Price Pressures and the Size Effects in an emerging Market.*, *Applied Financial Economics*.,1(7),469-475
- Kwiatkowski, D., Phillips, PCB, Schmidt, P. and Shin, Y. (1992) Testing the null of stationarity against the alternative of a unit root: how sure are we that economic time series have a unit root?. *Journal of Econometrics* 54 , 159-178
- Leandros Nikos., 1992., *Mass Media in Greece.*, Delfini Publications Athens
- Liang B.(1999) .,Price Pressure: Evidence from the ‘Dartboard’ Column. *Journals of Business* 72(1) 119-134.
- Liu, P., S.D. Smith, and A.A. Syed, (1990) "Stock Price Reactions to the Wall Street Journal's Securities Recommendations," *Journal of Financial and Quantitative Analysis*. 25 (1990), 399-410.



- MacKinnon, J.G (1996) Numerical distribution functions for unit root and cointegration tests. *Journal of Applied Econometrics*. 11. 601-618.
- MacKinnon, J.G (1991) Critical values of cointegration tests. In: Engle, R.F. and Granger , C.W.J (eds) *Long-Run Econometric Relationships: Readings in Cointegration*. New York: Oxford University Press.
- Mathus I and Wahead A(1995), Stock Prices Reactions to Securities recommendations in Business Week's 'Inside Wall Street.', *Financial Review.*,30(3), 583-604.
- Muratoglou G, and Yazici B., (2002)., Dissemination of Stocks Recommendations and small Investors.Who benefits? *Multinational Journal* 6(1),29-42
- Palmon O,Sun H and Tang P, (1994), The Impact of Publication of analysts Recommendations on Returns and Trading Volume.,*Financial Review.*, 29(3), 395-417.
- Phillips, P., and P. Perron. 1988. Testing for a unit root in time series regression. *Biometrika* Vol. 75 (June), pp. 335-346.
- Sant R and Zaman M A (1996)., Market Reactions to Business Week's Inside Wall Street' Column: A Self-Fulfilling Prophecy. *Journal of Banking and Finance*.20 617-643.
- Stock and Watson, "Introduction to Econometrics", 2003, Addison-Wesley.
- Tserkezos Dikaios και Mantidakis Melina, 2007, "Weather Variations and Newspapers Circulations. The Case of Some Athens Newspapers". Paper presented at Media and Communication , Quantitative and Econometric Analysis, Paris,Sorbonne,2007.([www.aeau.net/2007Paris/DOCUMENTS/Publication/Abstract/Mantidakis\\_Tserkezos.pdf](http://www.aeau.net/2007Paris/DOCUMENTS/Publication/Abstract/Mantidakis_Tserkezos.pdf)).
- Psychogios Dimitris , «The Uncertain Future of the Athens Newspaper'», Diavlos Publications, Athens, 1992.
- Psychogios Dimitris, University Notes 'The Newspapers in Greece' Pantio University Athens, 2008.