Feyyaz Zeren, PhD[1]
Namık Kemal University, Tekirdağ, Turkey
Erkan Öztürk, PhD[2]
Sakarya University, Sakarya, Turkey

TESTING FOR PROFIT PERSISTENCE OF LISTED MANUFACTURING COMPANIES IN ISTANBUL STOCK EXCHANGE

Abctract

In this paper, using the return on assets (ROA) and return on equity (ROE) ratios of the manufacturing companies listed on ISE (Istanbul Stock Exchange), it has been analysed whether the profits of those companies are persistent or not, with the usage of Hadri-Kurozumi (2012) panel unit root test. In the paper focusing on the period between 2007-Q1 and 2013-Q4, the fact that the panels have a heterogeneous structure is determined by Pesaran and Yamagata (2008) Slope Homogeneity Test. The existence of cross-sectional dependency is tested with $CDLM_{adj}$ test developed by Pesaran et al. (2008). As a result of the paper, it is determined that the profit is persistent in sectors that operate in manufacturing areas such as paper, packaging, printing, and rock, soil, cement. On the other hand, it has been found that the profit is not persistent for the chemistry, petroleum, plastic, metal machines, main metal and textile sectors.

Key words: *Persistence of Profits, Hadri-Kurozumi Panel Unit Root Test, Cross-Section Dependency, Manufacturing Companies, Istanbul Stock Exchange.*

JEL classification: L25, C23

ТЕСТИРАЊЕ ПОСТОЈАНОСТИ ПРОФИТА ПРОИЗВОДНИХ ПРЕДУЗЕЋА КОЈА СЕ КОТИРАЈУ НА ИСТАМБУЛСКОЈ БЕРЗИ

Апстракт

У раду је применом рациа приноса на активу (енгл. return on assets) и рациа приноса на капитал (енгл. return on equity) производних предузећа која се котирају на Истанбулској берзи (енгл. Istanbul Stock Exchange - ISE) анализирано да ли је профит ових компанија постојан или не употребом Хадри-Курозуми (2012) тест јединичног корена за панел серије. Рад се фокусира на период између 2007-Q1 и 2013-Q4, а чињеница је да панели имају хетерогену структуру која је детерминисана Пирсон-овим и Јамагат-овим тестом хомогености.

---

[1] fzeren@nku.edu.tr

[2] erozturk@sakarya.edu.tr

Постојање међусекторске међузависности је тестирано CDLM$_{adj}$ тестом који су утемељили Пирсон и сарадници (2008). Као резултат истраживања детерминисано је да је профит постојан у међусекторским односима у производњи, као што су: папир, паковање, штампа и кречњак, земљиште и цемент. С друге стране, утврђено је да профит није постојан у хемијској индустрији, индустрији нафте, пластике, металних машина, основних метала и текстилном сектору.

Кључне речи: постојаност профита, Хадри-Курозум-ов тест јединичног корена за панел серије, међусекторска међузависност, производна предузећа, Истанбулска берза.

Introduction

Size and operation areas of the business have changed with the industrialization period that affected a lot of places in the world, mainly Europe since the 18th century. As a result of this change, the competition among companies has turned out to be much more difficult.

According to the Schumpeterian economy approach (1939), the companies aiming to gain a sustainable competitive advantage by making innovations are able to get a monopoly power with this way. Thus, they can keep their profits above the norm for a long time (Cable and Mueller, 2008). In the process named as "creative destruction" by Schumpeter, innovations will lead to monopoly power and the power will lead to excessive profit and excessive profit will lead to copyists (Roberts, 2001). Under these conditions, the competitive uncertainties faced cannot be suppressed with the strategic management techniques. Because of the fact that the competitor companies will respond to abnormal profits by copying, these abnormal profits will never be permanent and soon will decrease to the average level. With every innovation presented in the long run, the cycle will repeat itself.

In order to test the profit sustainability of a company within Schumpeterian framework, Mueller (1977) formulated an autoregressive model. Inference of the model is based on specific assumptions. According to this, profit is consists of three main components. These are return of competition, permanent profits provided in the long run and short-term revenues that are assumed to be zero in the long run (Mueller, 1990). These elements are estimated with the model below;

$$\pi_{it} = \hat{\alpha}_i + \hat{\lambda}_i \pi_{it-1} + u_{it} \tag{1}$$

According to Geroski (1990), the model also includes unobservable factors that may affect profitability in the long run such as barriers to entry to the market. With this advantage of the model, the effects of unobservable variables related to competitiveness in the long-run profitability can be evaluated.

With the usage of the parameters attained by the equation 1, the indicator of long run profitability can be achieved as in the equation 2.

$$\hat{\pi}_{ip} = \frac{\bar{\alpha}_i}{1 - \hat{\lambda}_i} \tag{2}$$

While the attained $\hat{\pi}_{ip}$ shows the long-run sustainability of profitability depending on competition intensity, the estimated λ_1 parameter[1] measures convergence of profits in short-run (Cuaresma and Gschwandtner, 2008). It is expected to have $|\hat{\lambda}_1|$ where the magnitude of $|\hat{\lambda}_1|$ provides information about the convergence of profits in short-run. A value close to 1 indicates a slow convergence which implies persistence of profits. However, a value close to zero means that abnormal profits disappear in time. On the other hand, when $\hat{\pi}_{ip}$ calculated for many companies are determined to be statistically differentiating from others, it is concluded that some companies obtain permanent profitability in the long run (Mueller, 1986).

If the $\hat{\pi}_{ip}$ values computed for the companies in a market are very close to each other, no company can have a competitive superiority to others. In this case, long-run competitive superiority cannot be achieved. Thus, long-run sustainable profit potential of the company cannot be accrued. In a situation where there is no long-run sustainable profit, the greatness of λ_i that shows short-term profit does not have a meaning on its own (Mueller, 1986).

Previous Empirical Studies

Reference works which have formed the main structure of the methodology on the long-run sustainability of profits have been developed by Mueller (1977, 1986) together with Geroski and Jacquemin (1988). During the following years, in the studies of Cubbin and Geroski (1987), Schwalbach et. al. (1989), Odagiri and Yamawaki (1990), Mueller (1990), Cubbin and Geroski (1990), Waring (1996), Goddard and Wilson (1997), McGahan and Porter (1999), Glen et. al. (2001), Maruyama and Odagiri (2002), the profitability of companies from different countries and sectors have been evaluated; however, it has been concluded that the obtained findings can show differences depending on the country, sector and the evaluation period.

Providing great contributions to the subject with his recent research, Yurtoglu (2004) have used stationarity tests, as an addition to Mueller's model, in order to analyse the presence of a unit root. According to Yurtoglu, if the λ_i values computed for all companies are close to each other, the unit root study gives better result than Mueller's model (Yurtoglu, 2004). Almost all other studies after this one have been studied depending on the methods of time series and panel data stationarity analysis.

In the study conducted by Bentzen et. al. (2005), the data of 1310 companies operating in Denmark between 1990 and 2001 were used. As a result of panel stationarity analysis, it has been seen that the total industry profit is sustainable, the company profit is not.

Eklund and Wiberg (2007) examined the 21 annual data of 293 big European companies between 1984 and 2004; and they put forward that despite of converging, the profits of the companies achieving abnormal profits above the norm do not decrease to the average levels; and that the companies working on R&D can sustain their high profit in the long run.

Cuaresma and Gschwandtner (2008), studied the annual profit data of 156 American companies between 1950 and 1999, with the usage of time series analysis. As a result of this paper, they stated that industry intensity and size have a positive effect on the sustainability of industrial profit levels; however, market share and risks have negative effect on the sustainability of company profit level. Gschwandtner and

Cuaresma conducted their study again in 2013, and they have determined that the profits are more sustainable respectively in small and intense industries.

Kaplan and Celik (2008) analysed the profit data of 24 banks operating in Turkey between 1980 and 1998, with the usage of unit root analysis. As a result of the research, it is determined that there is sustainable profitability in the short term for the Turkish banking sector; however, because of the intense competition, excessive profits disappear in the long-run. In their study, in which they examine 25 banks working in Turkey between 1998 and 2009, Arslan and Iskenderoglu (2012) found out that the profit is not sustainable. Similarly, in the research, in which the profit data of 114 companies among the first 500 companies in Turkey, made by Arslan et. al. (2010), however, it has been seen that the long run profits do not converge. On the other hand, in the researches on insurance business, while Pervan et. al. (2013) find that the profit is sustainable, Konuk et. al. (2013) do not obtain these findings.

Bartoloni and Baussola (2009) analysed 5445 Italian companies' profit data between 1989 and 1997, and they worked on profit's high or low sustainability, which they call 'twin peaks phenomena'. As a result of this research, it has been seen that in both situations when the profitability is high or low, sustainability can still be achieved.

Goddard et. al. (2011) analysed profit sustainability of banks operating in 65 different countries between 1997 and 2007 in two-stages. In the first stage of this research, they studied to determine the convergence process of the short term profits with autoregressive model. It has been observed that the convergence process differs in each country. In the second stage of this research, long-run sustainable profitability was evaluated and the factors determining the competitiveness was modelled. According to the obtained results, it has been seen that while the profit sustainability has a negative relationship with per capita income, it has a positive relationship with the size of market access determinants.

In most of these studies, persistence of profits in the long run is explained by natural barriers of entry to the market and industry concentration. However, evidence about persistence of profits derived from the characteristics of the companies in only limited studies. In this study, it is aimed to investigate whether the profits of companies in the manufacturing industry are persistent or not, by separated sectorial basis.

Data and the Methodology

In this paper, 11 companies from paper, packing and printing sector, 16 companies from chemicals, petroleum, rubber and plastic sector, 17 companies from metal products and machinery sector, 12 companies from main metal sector, 18 companies from stone, soil and cement sector, and 18 companies from textile sector listed in the ISE manufacturing index, have been analysed. The dataset consists of 28 quarterly profit values between 2007-Q1 and 2013-Q4 of these companies, whose shares are listed on the stock exchange. In the paper, profit is measured by return on assets (ROA) and return on equity (ROE) values that have been obtained from financial reports of companies. Because of the fact that the financial reports before and after 2007 are not compatible, the start date of the database is determined as 2007.[2]

In this study, panel unit root test developed by Hadri-Kurozumi (2012) that considers both cross-section dependency and serial correlation was used. Along with these features,

Hadri-Kurozumi test can also consider unit root arising from the mutual factors forming the series, and allows the presence of mutual factors. This test, which can be described as the developed version of cross-section augmented dickey fuller (CADF) test, fills the deficiency of CADF test by testing the stationarity for all panels (Akbaş et. al., 2013). While the zero hypothesis of the test shows the panel's being stationary, the alternative hypothesis of the test shows the presence of a unit root in the panel.

Hadri-Kurozumi test carries out the process with the usage of Sul-Phillips-Choi (SPC) and Lag-Augmented (LA) methods. Autocorrelation can be corrected in SPC method by AR (p) process depending on seemingly unrelated regression (SUR) technique; on the other hand, in the LA method by adding one to the lag length in AR (p+1) process depending on Choi (1993) and Toda and Yamamoto (1995) (Göçer, 2013).

According to this test, model number 3 should be estimated first.

$$y = z_t \hat{\delta}_i + f_t \gamma_i + \varepsilon_{i,t} \tag{3}$$

The z_t in the formula is a deterministic term, and ε_{it} is represented as below.

$$\varepsilon_{i,t} = \emptyset_{i1}\varepsilon_{i,t-1} + \cdots + \emptyset_{ip}\varepsilon_{i,t-p} + v_{i,t} \tag{4}$$

At that point, Z^{SPC} and Z^{LA} statistics are computed by equation number 5 and 6 respectively.

$$Z^{SPC} = \frac{1}{\hat{\sigma}^2_{iSPC}T^2} \sum_{t=1}^{T}(S_{it}^{W})^2 \tag{5}$$

$$Z^{LA} = \frac{1}{\hat{\sigma}^2_{iLA}T^2} \sum_{t=1}^{T}(S_{it}^{W})^2 \tag{6}$$

In the evaluation of Hadri-Kurozumi (2012) test results, the findings from the cross-section dependency test have importance. The reason is that the unit root should be determined by considering Z^{SPC} that is calculated with the bootstrap method if there is a cross-section dependency in the panel, and by Z^{LA} that is calculated by using t statistics if there is no cross-section dependency in the panel.

The hypotheses of the study are as follows:

H_0: At least one series in the panel is stationary. (Profit is not permanent for any company)
H_1: All series in the panel have unit root. (Profit is permanent for at least one company)

According to these hypotheses; in the case of series have unit root, profit is persistent. In terms of Hadri-Kurozomi test, if the alternative hypothesis is accepted, it is possible to series have unit root. Therefore; it should be interpreted as in case of H_1 hypothesis is accepted, the profit is permanent; while in case of H_0 hypothesis is accepted, the profit is not permanent.

Empirical Findings

Company profits' being appropriate to the random walk theory shows unpredictable of profits (Canarella et. al., 2012). In this context, the series having unit root shows the being permanent of profits and the series' being stationary shows that there is a competitive structure in the sector and there is no sustainable profit (Arslan and Iskenderoglu, 2012).

Obtaining profit above normal levels in the long run is not seen as probable for markets with intense competition. Furthermore, if profit above the norm can be obtained in the long run, profit persistence can be mentioned (Arslan and Iskenderoglu, 2012).

In spite of all the firms mentioned in the manufacturing area in our study and it is assumed that there is a strong dependency between these sectors, every sector has its own dynamics within itself. Thus, whether the panels are homogenous or heterogeneous should be evaluated by experiential analysis and the unit root tests should be decided accordingly (Rufael, 2014). Slope Homogeneity Test results of our paper can be seen in Table 1.

Table 1: Pesaran and Yamagata (2008) Slope Homogeneity Test Results

Sector	ROA		ROE	
	Stat.	Prob.	Stat.	Prob.
Paper, Packaging, Printing	8.95	0.00*	25.24	0.00*
Chemistry, Petroleum, Plastic	2.32	0.01*	11.02	0.00*
Metal Products, Machines	9.55	0.00*	19.82	0.00*
Main Metal	12.59	0.00*	20.56	0.00*
Stone, Soil, Cement	6.82	0.00*	13.12	0.00*
Textile	17.07	0.00*	19.73	0.00*

* sign presents heterogeneity according to the significance level of 1%

According to the test results, it is determined that both ROA and ROE values belonging to all sectors are in heterogeneous structure and the panel unit root tests to be used when analysing profit's sustainability should be appropriate to this heterogeneous structure.

Another subject to be considered before going into the unit root tests is whether there is a cross-section dependency in the panel. Thus, the appropriate panel unit root method will be chosen according to this result.

Cross-section dependency was first analysed by CDLM test developed by Breusch and Pagan (1980). However, the deficiency of this test is that it presents deviant results when the group average is zero, but the individual averages are different from zero. Pesaran et al. (2008) could correct this deviance by adding variance and mean to the test statistics (Göçer, 2013). For this reason, $CDLM_{adj}$ test is used in this paper.

Table 2: $CDLM_{adj}$ Cross Section Dependency Test Results

Sector	ROA		ROE	
	Stat.	Prob.	Stat.	Prob.
Paper, Packaging, Printing	1.35	0.08***	1.36	0.08***
Chemistry, Petroleum, Plastic	0.75	0.22	1.72	0.04**
Metal Products, Machines	1.17	0.09***	0.69	0.75
Main Metal	3.89	0.00*	3.28	0.00*
Stone, Soil, Cement	0.43	0.33	0.72	0.23
Textile	1.19	0.09***	0.70	0.24

*, **, *** signs describe the presence of cross-section dependency in 1%, 5% and 10% respectively.

When the test results in the Table 2 are considered, according to both ROA and ROE values for the two sectors (paper, packaging, printing and main metal), there has been observed to be the presence of cross-section dependency. For three of this sectors (chemicals, petroleum, plastic; metal products and machine; and textile), there is a cross-section dependency according to either ROA or ROE. On the other hand, there is no cross-section dependency for stone, soil, cement sector.

Because of Hadri-Kurozumi (2012) panel unit root test presents the results for both situations where there is a cross-section dependency and there is not. According to this test results, Z^{SPC} values should be taken into consideration if there is cross-section dependency in panel, and Z^{LA} values should be taken into consideration if there is not. In order not to raise confusion, instead of giving both statistics in all panels, only one of Z^{SPC} or Z^{LA} values presented which should be evaluated for each panel in Table 3.

Table 3: Hadri-Kurozumi Panel Unit Root Test Results

Sector	ROA			ROE		
	Test	Stat.	Prob.	Test	Stat.	Prob.
Paper, Packaging, Printing	Z^{SPC}	2.25	0.02*	Z^{SPC}	1.77	0.03*
Chemistry, Petroleum, Plastic	Z^{LA}	1.17	0.11	Z^{SPC}	0.71	0.23
Metal Products, Machines	Z^{SPC}	0.62	0.26	Z^{LA}	- 0.69	0.75
Main Metal	Z^{SPC}	0.25	0.39	Z^{SPC}	0.37	0.35
Stone, Soil, Cement	Z^{LA}	2.18	0.02*	Z^{LA}	1.50	0.07**
Textile	Z^{SPC}	1.22	0.11	Z^{LA}	1.10	0.12

*, ** signs present stationarity according to the significance level of 5% and 10% respectively.

When the results of Hadri-Kurozumi panel unit root test in Table 3 are considered, it is found that the companies in paper, packaging, printing and stone, soil, cement sectors have sustained profits in the long run. Because the attained probability values for these companies are less than 10% and it is recognized the existence of unit root as null hypothesis. It is thought that long-run persistence of profits in this sector showing oligopolistic characteristics and natural barriers of entry to the industry, is caused by industry features. On the other hand, because of the intense competition in chemistry, petroleum, rubber, plastic, main metal and textile sectors, it has been seen that the profit is not persistent and company profitability indicators converge each other in the long run.

Concluding Remarks

With this study, regarding 92 companies from 6 different sectors chosen from Turkey, the persistence of profits is evaluated considering competition intensity. In the study, Hadri Kurozumi (2012) panel unit root test, that is appropriate for both cross-section dependency and heterogeneous panel structure, was used.

During the evaluation, it has been observed that the analysed companies in different sectors get affected by the competition intensity in different levels. It is determined that within the six sectors evaluated, some companies in paper, packaging, printing and stone, soil, cement sectors can maintain their profits in the long run. However, it is observed that

companies in other four sectors cannot maintain their profits in the long run due to intense competition.

Being the first research study evaluating the permanence of profits in the Turkish manufacturing industry presents the work's original side. However, should the data from before 2007 be amended according to IFRS, there may be other studies that has a wider observation period in the future with regulated data according for IFRS.

The analysis method used in the research measures the competition density in the evaluated sectors; yet, the attained test statistics cannot provide any information about the factors that affect the competition density. For this reason, the strongest power behind sustainable profitability cannot be determined. Thus, the future studies to be done in order to suppress this limitation will present a supplementary fact and extensive information.

References

Akbaş, Y. E., Şentürk, M., Sancar, C. (2013) Testing for Causality between the Foreign Direct Investment, Current Account Deficit, GDP and Total Credit: Evidence from G7, *Panoeconomicus*, 6, 791-812

Arslan, A., and İskenderoğlu, Ö. (2012) Türk Bankacılık Sektöründe Kârlılığın Kalıcılığının İncelenmesi, *Anadolu Üniversitesi Sosyal Bilimler Dergisi*, 12, 2, 59-68.

Arslan, A., Kula, F. and Kaplan, M. (2010) New Evidence on the Persistence of Profit in Turkey with First and Second Generation Unit Root Tests, *METU Studies in Development*, 37, April, 25-40.

Bartoloni, E. and Baussola, M. (2009) The Persistence of Profits, Sectoral Heterogeneity and Firms' Characteristics, *International Journal of the Economics of Business*, 16, 1, February, 87-111.

Bentzen, J., Madsen, E. S., Smith V. and Dilling-Hansen, M. (2005) Persistence in Corporate Performance? Empirical Evidence from Panel Unit Root Tests, *Empirica*, 32, 217-230.

Breusch, T. S and Pagan, A. R. (1980) The Lagrange Multiplier Test and Its Applications to Model Specification Tests in Econometrics. *Review of Economic Studies*, 47, 239-53

Cable, J. R. and Mueller, D. C. (2008) Testing of Persistence of Profits' Differences Across Firms, *International Journal of the Economics of Business*, 15, 2, 201-228.

Canarella, G., Miller, S. and Nourayi, M. (2012) Firm Profitability: Mean-Reverting or Random-Walk Behavior ?, *University of Connecticut Working Papers*.

Choi, I. (1993) Asymptotic Normality of the Least-Squares Estimates for Higher Order Autoregressive Integrated Processes with Some Applications, *Econometric Theory*, 9, 263-282

Cuaresma, J. C., and Gschwandtner, A. (2008) Explaining the Persistence of Profits: A Time-Varying Approach, *Working Papers*, 806, June, 1-20.

Cubbin, J. and Geroski P. (1987) The Convergence of Profits in the Long Run: Inter Firm and Inter - Industry Comparisons, *The Journal of Industrial Economics*, 35, 4, 427-442.

Cubbin, J. and Geroski, P. (1990) The Persistence of Profits in The United Kingdom, *The Dynamics of Company Profits: An International Comparison*, Edit: D. C. Mueller, Cambridge University Press, 147-167.

Eklund, J. E. and Wiberg, D. (2007) Persistence of Profits and The Systematic Search for Knowledge, *Cesis Electronic Working Paper Series*, March, 85-101.

Geroski, P. A. and Jacquemin, A. (1988) The Persistence of Profits: A European Comparison, *The Economic Journal*, 98, 391, 375-389.

Geroski, P. A. (1990) Modelling Persistent Profitability, *The Dynamics of Company Profits: An International Comparison*, Edit: D. C. Mueller, Cambridge University Press, 15-34.

Glen, J., Lee K. and Singh, A. (2001) Persistence of Profitability and Competition in Emerging Markets, *Economic Letters*, 72, 2, February, 247-253.

Goddard, J. A. and Wilson, J. O. (1997) The Persistence of Profits: A New Empirical Interpretation, *International Journal of Industrial Organization*, 17, 5, 663-687.

Goddard, J., Liu, H. Molyneux, P. and Wilson, J. O. (2011) The Persistence of Bank Profit, *Journal of Banking & Finance*, 35, April, 2881-2890.

Göçer, İ. (2013) Ar-Ge Harcamalarının Yüksek Teknolojili Ürün İhracatı, Dış Ticaret Dengesi ve Ekonomik Büyüme Üzerindeki Etkileri, *Maliye Dergisi*, Sayı 165, July-December

Gschwandtner, A. and Cuaresma, C. (2013) Explaining the Persistence of Profits: A Time-Varying Approach, *International Journal of the Economics of Business*, 20, 1, February, 39-55.

Hadri, K. and Kurozumi, E. (2012) A Simple Panel Stationarity Test in the Presence of Serial Correlation and a Common Factor, *Economics Letters*, 115, 31–34

Kaplan, M. and Çelik, T. (2008) The Peristence of Profitability and Competition in The Turkish Banking Sector, *Erciyes Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi*, 30, June, 157-167.

Konuk, F., Zeren, F. and Demirci, Ş.D. (2014) Persistence of Profitability in Turkey: Evidence from Insurance Sector, *Journal of Applied Economic Sciences,* 27, 57-64

Maruyama, N. and Odagiri, H. (2002) Does the 'Persistence of Profits' Persist?: A Study of Company Profits in Japan (1964–97), *International Journal of Industrial Organization*, 20, 10, 1513-1533.

McGahan, A. M. and Porter, M. E. (1999) The Persistence of Shocks to Profitability, *The Review of Economics and Statistics*, 81, 1, February, 143-153.

Mueller, D. C. (1977) The Persistence of Profits above the Norm, *Economica*, 44, 369-380.

Mueller, D. C. (1986) Profits in the Long Run, *Cambridge University Press*, New York.

Mueller, D. C. (1990) The Persistence of Profits in The United States, *The Dynamics of Company Profits: An International Comparison*, Edit: D. C. Mueller, Cambridge University Press, 35-57.

Odagiri, H. and Yamawaki, H. (1990) The Persistence of Profits in Japan, *The Dynamics of Company Profits: An International Comparison,* Edit: D. C. Mueller, Cambridge University Press, 129-146.

Pervan, M., Arnerić, J. and Ćurak, M. (2013) The Persistence of Insurers Profitability, *Croatian Operational Research Review*, 4, 132-141

Pesaran, M.H. and Yamagata, T. (2008) Testing Slope Homogeneity in Large Panels, *Journal of Econometrics*, 142(1), 50-93

Pesaran, M.H., Ullah, A. and Yamagata, T. (2008) A Bias-Adjusted LM Test of Error Cross-Section Independence, *Econometrics Journal*, 11, 105-127

Roberts, P. W. (2001) Innovation and Firm-Level Persistent Profitability: A Schumpeterian Framework, *Managerial and Decision Economics*, 22, 239-250.

Rufael, Y.W., (2014) Electricity Consumption and Economic Growth in Transition Countries: a Revisit Using Bootstrap Panel Granger Causality Analysis, *Energy Economics,* 44, 325–330

Schumpeter, J. A., (1939) Business Cycles, McGraw Hill Book Company Inc., United States of America

Schwalbach, Graßhoff, J. U. and Mahmood, T. (1989) The Dynamics of Corporate Profits, *European Economic Review*, 33, 1625-1639.

Toda, H.Y. and Yamamoto, T. (1995) Statistical Inference in Vector Autoregressions with Possibly Integrated Processes, *Journal of Econometrics*, 66, 225-250.

Yurtoğlu, B. B. (2004) Persistence of Firm-Level Profitability in Turkey, *Applied Economics*, 36, 6, 615-625.

Waring, G. F. (1996) Industry Differences in the Persistence of Firm – Specific Returns, *American Economic Review*, 86, 5, 1253-1265.

Endnotes:

1. Although there were some differences between the application style of the method, database, and research estimates, the λ_i values computed in these studies are estimated to be between 0,2 and 0,66 (Bentzen et. al., 2005).

2. Since 2007, the companies listed in the ISE started to prepare their consolidated financial reports according to International Financial Reporting Standards (IFRS) in order to adapt to European Union norms, instead of Generally Accepted Accounting Principles (GAAP) in Turkey.