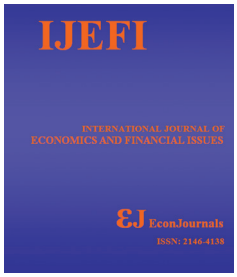

International Journal of Economics and Financial Issues

ISSN: 2146-4138

available at http: www.econjournals.com

International Journal of Economics and Financial Issues, 2015, 5(2), 624-628.

# Persistence of Profit in Energy Industry: Dynamic Evidence from Turkish Companies

**Onur Gozbasi[1]*, Alper Aslan[2]**

[1]Department of Business Administration, Nuh Naci Yazgan University, Kayseri, Turkey, [2]Department of Economics, Nevsehir Haci Bektas University, Nevsehir, Turkey. *Email: onurgozbasi@gmail.com

**ABSTRACT**

One of the main lacks of the profit persistence literature is the fact that it focuses on only manufacturing, banking and food industries. This study, for the first time, extends the literature by considering the intensity of competition in 13 energy companies from 1997 to 2011 in Turkey as an emerging market. The results show that the degree of persistence is higher in the energy industry mainly due to a low degree of market saturation, weak price competition and a lowly concentrated retailing industry, thus providing no support for the hypothesis that there is a lower persistence of profits in emerging markets due to more intense competition in Turkey.

**Keywords:** Persistence of Profit, Energy Industry, Competition
**JEL Classifications:** G30, L10, C22

## 1. INTRODUCTION AND LITERATURE REVIEW

The literature on the persistence of profit has developed considerably since it was first introduced by Mueller (1977). From a theoretical viewpoint the competitive process should remove abnormal profits in the market. According to this fact, known as the "persistence of profit" in the finance literature, the profits are equalized to a competitive rate after some time in industries. In other words, company profits are not expected to be persistent in industries. In this study, we try to present the first evidence on the persistence of profit by focusing on the energy industry.

The persistence of profit is investigated by performing various applications on manufacturing companies in the studies by Mueller (1977), Mueller (1986) and Geroski and Jacquemin (1988), which are considered to be the pioneering studies on persistence of profit. This issue has been discussed for a long time and the literature on the subject has become quite extensive. It is possible to find studies that investigate whether the persistence of profit exists, as well as the studies investigating the factors that have an impact on profitability. In addition, there are studies conducting analysis on a single country, as well as the studies performing multinational analysis (Table 1). Accordingly, it is observed that the results vary by country, industry and period (Schwalbach et al., 1989; Mueller, 1990; Cubbin and Geroski, 1990; Jenny and Weber, 1990; Odagiri and Yamawaki, 1990; Schohl, 1990; Khemani and Shapiro, 1990; Waring, 1996; Goddard and Wilson, 1999; Glen et al., 2001; Maruyama and Odagiri, 2002; Yurtoglu, 2004; Goddard et al., 2004; Gschwandtner, 2005; Bektas, 2007; Wiberg, 2009; Goddard et al., 2011; Iskenderoglu et al., 2011; and Gschwandtner and Hirsch, 2013).

In a multi-country study Goddard et al. (2004) evaluate the persistence of profit by considering the 1992-1998 periods of 583 banks in France, UK, Germany, Italy and Spain. As a result the authors find a long-term persistence of growth. However, persistence of profit is only observed in the short-term, also it is concluded that the persistence of profit varies by countries and different types of banks. Another multi-country study by Geroski and Jacquemin (1988) uses a sample of 134 large European firms; 51 firms from the UK for the period of 1949-1977, 28 firms from West Germany for the period of 1961-1981 and 55 firms from France for the period of 1965-1982. Their results suggest that the profits of UK firms are predictable to a greater degree than France or German. Also countrywide factors have turned out to be more

**Table 1: Summary of empirical literature**

| Study | Country | Period | Persistence parameter (Lambda) |
|---|---|---|---|
| Geroski and Jacquemin (1988) | UK | 1949-1977 | 0.49 |
| | France | 1965-1982 | 0.41 |
| | Germany | 1961-1981 | 0.41 |
| Schwalbach et al. (1989) | Germany | 1961-1982 | 0.49 |
| Mueller (1990a) | USA | 1950-1972 | 0.18 |
| Cubbin and Geroski (1990) | UK | 1948–1977 | 0.48 |
| Jenny and Weber (1990) | France | 1965-1982 | 0.36 |
| Odagiri and Yamawaki (1990) | Japan | 1964-1982 | 0.47 |
| Schohl (1990) | Germany | 1961-1981 | 0.51 |
| Khemani and Shapiro (1990) | Canada | 1964-1982 | 0.43 |
| Waring (1996) | USA | 1970-1989 | 0.66 |
| Goddard and Wilson (1999) | UK | 1972-1991 | 0.46 |
| Glen et al. (2001) | India | 1982-1992 | 0.22 |
| | Malaysia | 1983-1994 | 0.35 |
| | Korea | 1980-1994 | 0.32 |
| | Brazil | 1985-1995 | 0.01 |
| | Mexico | 1984-1994 | 0.22 |
| | Jordan | 1980-1994 | 0.35 |
| | Zimbabwe | 1980-1994 | 0.42 |
| Maruyama and Odagiri (2002) | Japan | 1964-1997 | 0.54 |
| Yurtoglu (2004) | Turkey | 1985-1998 | 0.38 |
| Goddard et al. (2004) | Denmark, France, Germany, Italy, Spain, UK | 1992-1998 | 0.26 |
| Gschwandtner (2005) | USA | 1950-1999 | 0.38 |
| Bektas (2007) | Turkey | 1989-2003 | 0.42 |
| Wiberg (2009) | 14 European countries | 1984-2004 | 0.48 |
| Goddard et al. (2011) | 65 developed and developing Countries | 1997-2007 | 0.42 |
| Iskenderoglu et al. (2011) | Turkey | 1998-2009 | 0.41 |
| Gschwandtner and Hirsch (2013) | Belgium | 1996-2008 | 0.06 |
| | France | | 0.19 |
| | Italy | | 0.14 |
| | Spain | | 0.20 |
| | UK | | 0.23 |

discriminating than firm or industry specific ones. On the other hand, Gschwandtner and Hirsch (2013) analyses profit persistence in the European food industry. As a result it is found that the degree of profit persistence in the food industry is lower compared with other manufacturing sectors due to strong competition among food processors and high retailer concentration. Furthermore, firm size is found to be an important driver of persistence, while firm age, risk and R&D intensity have a negative influence.

In a study by Bektas (2007), time series analysis is carried out on 28 Turkish banks between the period 1989 and 2003. As a result it is found that average profits converge to zero and the profits are not persistent in the long run. Moreover, the author concludes that the competitive structure of the industry in the Turkish banking system eliminates the above-average profits in the long-term. Likewise, Iskenderoglu et al. (2011) examined the persistence of profit within Turkish banking system for the period 1998-2009 by focusing on both net income after tax to total assets (return on assets) and net income after tax to total equity (return on equity). As a result the competition is found to be high within the Turkish banking system, similar to Bektas's (2007) study. In another study on the persistence of profit in banking industry Lee et al. (2014) uses panel data on 22 countries between the period 1995 and 2009. As a result it is found that the persistence is greatly affected by income level of country. Also the persistence of the bank profit (risk) is found to be different among different bank categories.

Gschwandtner (2005) studied on not only the surviving companies but also exiter companies for the period of 1950-1999 in United States of America. As a result it is found that while the exiter companies perform more competitively than the survivors, there is still significant evidence for persistence of profit in both samples also concentration and growth of the industry as well as size and volatility of profits seem to play an important role in explaining persistence. In a study by Goddard et al. (2011), which has an extensive sample compared to others, data of 11.634 banks from 65 countries were utilized in a dynamic panel estimation method. In the study, firstly the persistence of profitability is investigated separately for the 65 countries in the 1997-2007 sampling period, and then the relationship between macroeconomic variables and persistence of profit is investigated. As a result the profitability is found to be more persistent in the developed countries. The study by Maruyama and Odagiri (2002) examined if Odagiri and Yamawaki's (1990) earlier article, which expressed the persistency of profits of Japanese manufacturing firms for the period 1964-1982 (Period 1), stand the test of time. Maruyama and Odagiri (2002) have added 15 more years of data (Period 2/1983-1997) and found that firms estimated to earn higher-than-average long-run profit rates in the early study were again estimated to earn higher-than-average long-run profit rates. Also it is concluded the firm's profit performance is found to be positively related to measures of market share.

The energy industry in Turkey has become one of the most important industries and the most attractive field of investment in regards to foreign direct investment. Turkey is the 6th largest economy in Europe and 17th largest economy in the world with a gross domestic product of approximately USD 820 billion in 2013. Over the past decade, with its economic developments, driven by industrialization and urbanization, demand in the Turkish electricity market has been growing in line. Having a position central to the regions of Europe, the Balkans, the Aegean, the Black Sea, the Caucasus-Caspian Basin and Central Asia, Turkey's importance in world energy markets is growing, both as a regional energy transit hub and as a growing consumer. Turkey's role as an energy transit hub is increasingly important. Turkey is a key part of oil and natural gas supplies movement from Russia, the Caspian region, and the Middle East to Europe. Over the past years, Turkey has experienced some of the fastest growth in energy demand of the OECD countries. The Turkish electricity market is one of the fastest growing in the world, with an average of approximately 9% annual growth in 2010 and 2011. Similar to the electricity market, natural gas consumption in Turkey is growing as well. Natural gas consumption in Turkey reached approximately 46 bcm in 2012 demonstrating an increase of 4.7% compared to the previous year. According to the International Energy Agency, energy use will continue to grow at an annual growth rate of around 4.5% from 2015 to 2030, approximately doubling over the next decade (ISPAT, 2013; EIA, 2014).

The purpose of this study is to present the first evidence on the persistence of profit in the Turkish energy industry. Since there is higher capital requirement compared to the other industries, we focused on the energy industry. As entry barriers have already existed, one can suppose higher profit rates in energy industry especially for developing countries. The rest of the article is organized as follows: Section 2 presents the data and outlines the methodology; Section 3 provides the empirical findings, followed by conclusions in Section 4.

## 2. DATA AND METHODOLOGY

In order to analyze profit persistency in the Turkish energy industry we use a panel data set for 13 companies which survive from 1997 to 2011 in Borsa Istanbul (BIST). Annual net income (after taxes) data of companies is obtained from the FINNET database (www.finnet.com.tr).

Researchers who want to answer the question of whether or not series is stationary have tried to gain power by developing new test in the panel studies. Profit rates - one of the most popular series - Across the countries are likely to demonstrate changing means and/or trends eventually. To investigate the series by allowing for breaks in both the level and trend, Im et al. (2005) panel Lagrange multiplier (LM) unit root test employed. In addition, Im et al. (IPS) (2003) and LM test which is suggested by Lee and Strazicich (2003) are employed. LM unit root can be explained using the following data generating process. In equation (1), r is the profit rates and $K_t$ consist of exogenous variables and $\varepsilon_t$ is error term. A unit root test statistic can be gained from the following regression:

$$r_t = \delta' K_t + X_t, \quad X_t = \beta X_{t-1} + \varepsilon_t \tag{1}$$

Here, $\Delta$ is the first difference operator $\bar{S}_t = r_t - \hat{\Psi}_t - K_t\hat{\delta}_t$ t=2,….T; $\hat{\delta}$ are coefficients in the regression of $\Delta r_t$ on $\Delta K_t$; $\hat{\Psi}_x$ is given by $r_t - K_t\delta$.

If profit rate has a unit root for company i then $\phi_t$=0, which is the null hypothesis tested using the t-test against the alternative hypothesis that $\phi_t$<0. The panel LM test statistic is obtained by averaging the optimal univariate LM unit root t-test statistic estimated for each energy companies. This is indicated as $LM_i^\tau$

$$LM_{barNT} = \frac{1}{N}\sum_{i=1}^{N} LM_i^\tau \tag{2}$$

Im et al. (2005) constructed a standardized panel LM unit root test statistic by letting $E(L_T)$ and $V(L_T)$ denote the expected value and variance of $LM_i^\tau$ respectively under the null hypothesis. Im et al. (2005) then compute the following expression:

$$\Psi_{LM} = \frac{\sqrt{N}\,[LM_{barNT} - E(L_T)]}{\sqrt{V(L_T)}} \tag{3}$$

The numerical values for $E(L_T)$ and $V(L_T)$ are presented in Im et al. (2005). The asymptotic distribution is unaffected by the presence of structural breaks and is standard normal. The panel LM test results are reported in Table 2.

## 3. FINDINGS

Levin and Lin (1993) show that employing a unit root test on a pooled cross-section data set, rather than individual unit root tests,

**Table 2: Panel IPS and panel LM unit root test results**

| Company | Without trend | With trend |
|---|---|---|
| AK ENERGY | −3.8570** | −4.5069** |
| AKSU ENERGY | −4.4932*** | −3.6728* |
| AYEN ENERGY | −3.3821** | −3.2044 |
| AYGAZ | −3.2695** | −3.1537 |
| EMKEL | −5.8301*** | −4.2340** |
| ISIKLAR | −0.0754 | −5.3202*** |
| IPEK ENERGY | −3.0283* | −2.9350 |
| PETKIM | −5.8999*** | −4.2639** |
| PARK | −4.3738*** | −5.1499*** |
| PETROL OFISI | −5.0451*** | −4.8101** |
| TURCAS | −3.1642* | −5.0334*** |
| TUPRAS | −4.3553*** | −6.3047*** |
| ZORLU ENERGY | −2.9087* | −4.3643** |
| Panel IPS | −8.02791*** | −7.58114*** |
| Panel LM | With one break | With two breaks |
| | −5.6208*** | −8.8965*** |

Note: ***, ** and * statistical significance at 1%, 5% and 10% levels. IPS: Im Pesaran and Shin, LM: Lagrange multiplier

may supply significant improvement in statistical power (Narayan, 2006). This statement is examined by applying the panel version of the LM and IPS individual unit root test to the group of 13 companies in the sample.

Panel analysis which is used to increase power in small time spans of data illustrate that the joint null hypothesis of a unit root is rejected, implying convergence of energy' profits in Turkey. In persistence of profit studies, these ideas are formulated within the following first order auto-regressive equation:

$$\rho_{i,t} = \alpha_i + \lambda i \rho_{i,t-1} + \varepsilon_{i,t} \quad (4)$$

Where $\rho_{i,t}$ is the profitability of firm i at time t. α is constant and $\lambda i$ is the parameter that represents the speed of adjustment coefficients of excess profits to the norm and $\varepsilon_{i,t}$ is the usual error term. Where $\rho_{i,t}$ is derived as follows:

$$\rho_{i,t} = \vartheta_{i,t} - \overline{\vartheta}_t$$

Where $$\overline{\vartheta}_t = \sum_{i=1}^{n} \frac{\vartheta_t}{n} \quad (5)$$

In equation (5), $\overline{\vartheta}_t$ is the average profit rate of energy companies operating in the industry for the current year. Equation (1) is the reduced form of the two equations model as illustrated by Geroski (1990). In the first equation, the difference between the actual profit rate and the previous year's long-term rate of profit leads to the threat of the new firms' entry or to exit the industry. In the second equation, it is assumed that entry threat decreases the profit rate and vice versa. The value of $\hat{\lambda}$ in the model represents the intensity of competition or speed of adjustment towards the mean profit of the energy industry which could be used as the persistency of the profits. The long-run profit rate or equilibrium profit rate of a firm, is provided by $\rho_{i,t} = \frac{\alpha}{1-\lambda_i}$

Small values of $\hat{\lambda}$ which are close to zero indicate a low degree of persistence of past profits and a quick erosion of short-run rents. Small values can therefore also be seen as a sign of high competition (Bektas, 2007).

Table 3 summarizes regression results in equation (4). The estimated varies between −0.05 and 0.799 with a panel. The panel value of the speed of adjustment is 0.127. While only one company' persistence of profit parameter is negative, no firm is above the panel persistence of profit parameter. Comparing the results with other studies analyzing mainly entire manufacturing industries and banking industry it has to be noted that the degree of persistence is higher in the energy industry.

**Table 3: Speed of adjustment and the estimates of long-run projected profit rate**

| Company | $\hat{\alpha}$ | $t(\hat{\alpha})$ | $\hat{\lambda}$ | $1-\hat{\lambda}$ | $\hat{\rho}_{i,t} = \hat{\alpha}/1-\hat{\lambda}_i$ | $R^2$ |
|---|---|---|---|---|---|---|
| AK ENERGY | 0.103 | 1.673 | 0.525 | 0.475 | 0.217 | 0.253 |
| AKSU ENERGY | 0.124 | 2.785 | 0.502 | 0.498 | 0.249 | 0.271 |
| AYEN ENERGY | 0.097 | 4.674 | 0.799 | 0.201 | 0.483 | 0.495 |
| AYGAZ | 0.306 | 3.762 | 0.725 | 0.275 | 1.113 | 0.520 |
| EMKEL | 0.172 | 2.692 | 0.146 | 0.854 | 0.201 | 0.024 |
| ISIKLAR | 0.839 | 2.352 | 0.674 | 0.326 | 2.574 | 0.557 |
| IPEK ENERGY | 0.204 | 1.969 | 0.333 | 0.667 | 0.306 | 0.333 |
| PETKIM | 0.746 | 2.698 | 0.315 | 0.685 | 1.089 | 0.154 |
| PARK | 0.161 | 0.458 | 0.670 | 0.330 | 0.488 | 0.445 |
| PETROL OFISI | 0.233 | 3.731 | 0.614 | 0.386 | 0.604 | 0.345 |
| TURCAS | 0.413 | 1.989 | 0.013 | 0.987 | 0.418 | 0.160 |
| TUPRAS | 0.721 | 0.134 | −0.050 | 1.050 | 0.687 | 0.012 |
| ZORLU ENERGY | 0.111 | 3.422 | 0.236 | 0.764 | 0.145 | 0.110 |
| Panel | 0.997 | 1.191 | 0.873 | 0.127 | 7.850 | 0.775 |

Note: For DOLS analysis, lead and lag is selected as 1 by AIC

## 4. CONCLUSION

Micro economic theories assert that abnormal firm and industry profits will not persist for any significant length of time. This study analyzes the persistence of profit in the Turkish energy industry. We use a panel data set for 13 companies from 1997 to 2011. Distinctively speed of adjustment and the estimates of long-run profit rate presents that competition is not found in the Turkish energy industry. The high degree of profit persistence in the energy industry can be interpreted as a result of weak price competition, low degree of market saturation and a lowly concentrated retailing industry.

From the researchers point of view an extension of the analysis on advanced economies with long dataset and more companies within energy industry could be a starting point for further research. However, the purpose of the present study was to give a first impression of the profit persistence phenomena in the energy industry.

## REFERENCES


Bektas, E. (2007), The persistence of profits in the Turkish banking system. Applied Economics Letters, 14(3), 187-190.

Cubbin, J., Geroski, P.A. (1990), The persistence of profits in the United Kingdom. In: Mueller, D.C., editor. The Dynamics of Company Profits: An International Comparison. Cambridge: Cambridge University Press. p147-168.

EIA, 2014. U.S. Energy Information Administration Turkey Country Report. Available from: http://www.eia.gov/countries/analysisbriefs/Turkey/turkey.pdf.

Geroski, P.A., Jacquemin, A. (1988), The persistence of profits: A European comparison. The Economic Journal, 98(391), 375-389.

Geroski, P.A. (1990), Modeling persistent profitability. In: Mueller, D.C., editor. The Dynamics of Company Profits: An International Comparison. Cambridge: Cambridge University Press. p15-34.

Glen, J., Lee, K., Singh, A. (2001), Persistence of profitability and competition in emerging markets. Economics Letters, 72(2), 247-253.

Goddard, J., Wilson, J.O.S. (1999), The persistence of profit: A new empirical interpretation. International Journal of Industrial Organization, 17(5), 663-687.

Goddard, J., Molyneux, P., Wilson, J.O.S. (2004), The profitability of European banks: A cross-sectional and dynamic panel analysis. Manchester School, 72(3), 363-381.

Goddard, J., Liu, H., Molyneux, P., Wilson, J.O.S. (2011), The persistence

of bank profit. Journal of Banking and Finance, 35(11), 2881-2890.
Gschwandtner, A. (2005), Profit persistence in the 'very' long run: Evidence from survivors and exiters. Applied Economics, 37(7), 793-806.
Gschwandtner, A., Hirsch, S. (2013), Profit persistence in the food industry: Evidence from five European countries. European Review of Agricultural Economics, 40(5), 741-759.
Im, K., Lee, J., Tieslau, M. (2005), Panel LM unit root test with level shift. Oxford Bulletin of Economics and Statistics, 67(3), 393-419.
Im, K.S., Pesaran, M.H., Shin, Y. (2003), Testing for unit roots in heterogeneous panels. Journal of Econometrics, 115(1), 53-74.
Iskenderoglu, O., Alper, A., Ozturk, I. (2011), Persistence of profit in Turkish banking firms: Evidence from panel LM tests. Actual Problems of Economics, 10(124), 429-434.
ISPAT, (2013), The energy sector: A quick tour for the investor. Republic of Turkey Prime Ministry Investment Support and Promotion Agency Report. Available from: http://www.invest.gov.tr.
Jenny, F.Y., Weber, A.P. (1990), The persistence of profits in France. In: Mueller, D.C., editor. The Dynamics of Company Profits: An International Comparison. Cambridge: Cambridge University Press. p123-128.
Khemani, R.S., Shapiro, D.M. (1990), The persistence of profits in Canada. In: Mueller, D.C., editor. The Dynamics of Company Profits: An International Comparison. Cambridge: Cambridge University Press. p77-104.
Lee, C.C., Yanga, S.J., Chang, C.H. (2014), Non-interest income, profitability, and risk in banking industry: A cross-country analysis. North American Journal of Economics and Finance, 27, 48-67.
Lee, J., Strazicich, M.C. (2003), Minimum lagrange multiplier unit root tests with two structural breaks. The Review of Economics and Statistics, 85(4), 1082-1089.
Levin, A., Lin, C.F. (1993), Unit Root Test in Panel Data: New Results. University of California at San Diego, Discussion Paper No. 93-56.
Maruyama, M., 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.
Mueller, D.C. (1977), The persistence of profits above the norm. Economica, 44(176), 369-380.
Mueller, D.C. (1986), Profits in The Long Run. Cambridge: Cambridge University Press.
Mueller, D.C. editor. (1990), Dynamics of Company Profits: An International Comparison. Cambridge: Cambridge University Press.
Mueller, D.C. (1990a), Profits and the process of competition. In: Mueller, D.C., editor. The Dynamics of Company Profits: An International Comparison. Cambridge: Cambridge University Press. p1-14.
Narayan, P.K. (2006), Are G7 real per capita GDP levels non-stationary, 1870-2001? Japan and the World Economy, 19(3), 374-379.
Odagiri, H., Yamawaki, H. (1990) The persistence of profits in Japan. In: Mueller, D.C., editor. The Dynamics of Company Profits: An International Comparison. Cambridge: Cambridge University Press. p129-146.
Schohl, F. (1990), Persistence of profits in the long run: A critical extension of some recent findings. International Journal of Industrial Organization, 8(3), 385-404.
Schwalbach, J., Grasshoff, U., Mahmood, T. (1989), The dynamics of corporate profit. European Economic Review, 33(8), 1625-1639.
Waring, G.F. (1996), Industry differences in the persistence of firm specific returns. The American Economic Review, 86(5), 1253-1265.
Wiberg, D. (2009), Persistence of Profits and the Systematic Search for Knowledge. The Royal Institute of Technology CESIS Electronic Working Paper Series, Paper No.161.
Yurtoglu, B.B. (2004), Persistence of firm-level profitability in Turkey. Applied Economics, 36(6), 615-625.