



**RE-EXAMINING PROFIT PERSISTENCE IN THE TURKISH ENERGY MARKET:  
EVIDENCE FROM PANEL AUTOREGRESSIVE-DISTRIBUTED LAG**

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**ABSTRACT**

*This paper re-examines Persistence of Profit (PP) in the Turkish energy market by utilizing the recent developments in panel data. We employ panel ARDL (Autoregressive-Distributed Lag) to see how persistence parameter varies for short and long run by examining five companies which survive from 2005q1-2015q3. We conclude that in short run persistence is more common than long run. Although there are high barriers to entry energy market, PP parameter is relatively low when we focus the PP literature.*

**Keywords:** Persistence of profit, energy market, Panel ARDL

**JEL codes:** G30, L10.

**I. INTRODUCTION**

Starting with the seminal paper by Mueller (1977), the literature on the persistence of profit (PP) has examined noticeably. This view based on that whether the viewpoint the competitive process should remove abnormal profits in the market or not. One can think by taking competitive theory into account that company profits are not expected to be persistent in industries. The dynamic, Schumpeterian view of competition hypothesizes the process of creative destruction, wherein current firms and new participants easily and respond to market forces. In such an environment – a perfectly competitive market – current firms in industries will create high profits. These high profits will encourage entrepreneurs. This will, in turn, drive down profits, restoring them to “normal” levels. (Eklund and Desai, 2013).

In this developing PP literature, for which examples include, Geroski and Jacquemin (1988) for UK, France and Germany; Schwalbach et al. (1989) for Germany; Cubbin and Geroski (1990) for UK; Waring (1996) for USA; Goddard and Wilson (1999) for UK; Maruyama and Odagiri (2002) for Japan; Wiberg (2009) for 14 European countries, measures of profit persistence are large and inconsistent with competitive equilibrium. It is surprising finding.



Because these studies focused on developed countries and we hope that competitive market is more suitable for developed countries than developing countries. In addition to above studies, Glen et al. (2001) examined a group of developing countries such as India, Malaysia, Korea, Brazil, Mexico, Jordan and Zimbabwe. They concluded that competitive market is more common in these developing countries by considering persistence of profit parameter. Therefore, the literature for PP is still ambiguous. For this reason, Turkey is examined in this study. In literature, persistence of profit for Turkey has examined by Bektas (2007); Kaplan and Aslan (2008); Kaplan and Celik (2008); Aslan et al. (2010); Tunay et al. (2014); Gozbası and Aslan (2015).

Kaplan and Aslan (2008) report on time series analysis of the persistence of corporate profitability and its constituent parts for the largest 114 manufacturing firms in Turkey. Its central result is that the observed persistency of profits in the markets is due to persistency of productivity rather than the persistency of profit margins suggesting that pro-competitive characteristics of markets in Turkey. For banking sector, Bektas (2007) uses the panel data method to test for unit roots of profitability data and their persistency in the banking sector of an emerging country. Unit root hypothesis of data is rejected and concluded that in the long run persistency of profits does not exist. In another study for banking, Kaplan and Celik (2008) conclude that relates the differences in profitability across banks to profitability persistency in the Turkish Banking Sector.

Aslan et al. (2010) report new empirical evidence on the subject for 114 of the largest manufacturing firms in Turkey over the period 1985-2005 by the first and second generation panel data unit root analysis of corporate profitability. They also repeated the unit root tests utilized for smaller sub-samples: the pre-customs union and post-customs union years of 1985–1995 and 1996-2005, in addition to full span analysis. The empirical findings of this paper illustrate that results are not sensitive to the sampling periods selected and Customs Union does not generate substantial welfare at least for a sample of 114 listed companies drawn among 500 largest firms in Turkey.

Tunay et al. (2014) examined the Turkish insurance sector. The measures of profitability, ROA and ROE are also used for 58 insurance companies for the years 2002-2012. The persistence of profit is examined by using the dynamic panel model. Although the results of analysis indicate that the profit shows persistency in the short run it is not persistent in the long run. For energy market; Gozbası and Aslan (2015) examined 13 energy companies from 1997 to 2011 in Turkey. 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.

In this study apart from the literature; PP is examined for both short and long run in Turkey by utilizing panel ARDL method. For this aim, section 2 presents data, methodology and results. The last section includes conclusion.

## **II. DATA, METHODOLOGY AND RESULTS**

In order to analyze profit persistency in the Turkey, we use a panel data set for five companies (AKENR, AKSEN, AKSUE, AYEN and ZOREN) which survive between from 2005:Q1 to 2015:Q3 in BorsaIstanbul (BIST). Annual net income (after taxes) data of companies is obtained from the FINNET database ([www.finnet.com.tr](http://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.

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.

**Table 1. Unit Root Results**

Method	Without Trend		With Trend	
	Statistic	Prob.	Statistic	Prob.
<b>Levin, Lin &amp; Chu t</b>	-2.31621	0.0103	-4.94508	0.0000
<b>Im, Pesaran and Shin W-stat</b>	-4.94508	0.0000	-3.90228	0.0000
<b>ADF - Fisher Chi-square</b>	44.6325	0.0000	33.1581	0.0003
<b>PP - Fisher Chi-square</b>	34.5416	0.0001	23.9510	0.0077

Note: lag selection depends on Akaike Information Criteria (AIC)



By following Gozbası and Aslan (2015), in persistence of profit studies, these ideas are formulated within the following first order auto-regressive equation:

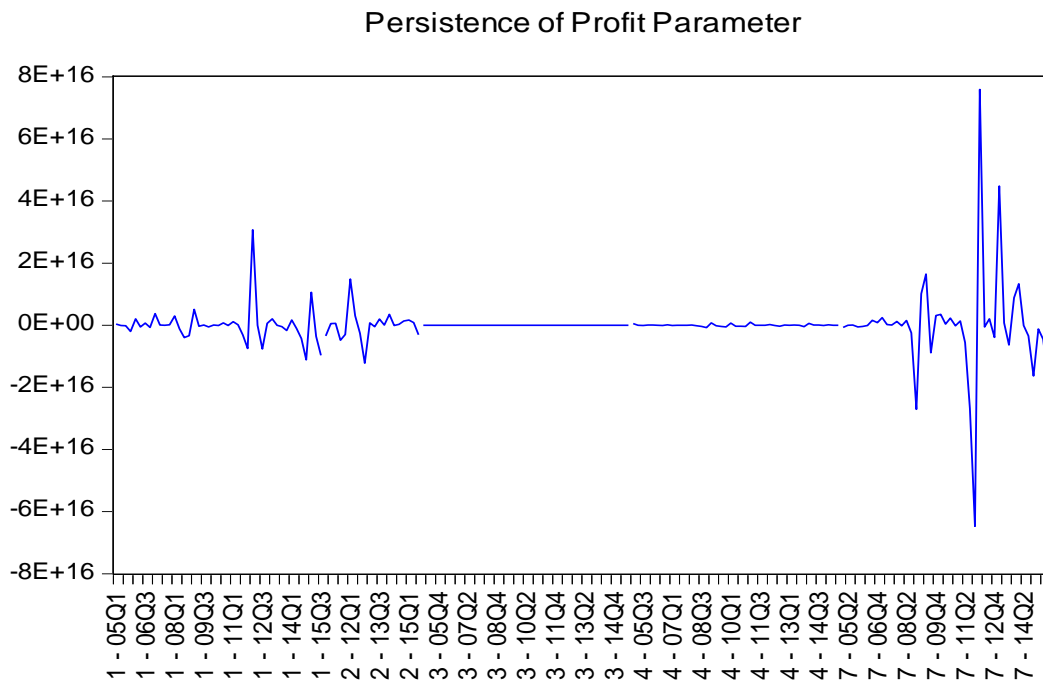
$$\rho_{i,t} = \alpha_i + \lambda_i \rho_{i,t-1} + \varepsilon_{i,t} \quad (1)$$

where  $\rho_{i,t}$  is the profitability of firm  $i$  at time  $t$ .  $\alpha$  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:

$$\rho_{i,t} = g_{i,t} - \bar{g}_t \text{ where } \bar{g}_t = \sum_{i=1}^n \frac{g_t}{n} \quad (2)$$

In Equation 2,  $\bar{g}_t$  is the average profit rate of energy companies operating in the industry for the current year as illustrated by Geroski (1990).

Graph 1. Volatility of Persistence of Profit Parameter  
Gradients of the Objective Function



**Note:** AKENR is 1; AKSEN is 2; AKSUE is 3; AYEN is 4 and ODAS is 7.



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  $\hat{\lambda}$  values can therefore also be seen as a sign of high competition (Bektas, 2007; Gozbası and Aslan, 2015 ). While Table 2 illustrates us time series reports for PP parameter; Table 3 shows panel results. According to time series findings, AYEN has the lowest PP parameter. On the other hand, AKSEN has the highest value of PP parameter. This result can be interpreted that AKSEN illustrates persistence in profit while AYEN is more competitive. The PP parameter varies from 0.02 to 0.69.

**Table 2. Time Series Reports of Persistence of Profit**

Company	$\hat{\lambda}$	Std. Error	t-Statistics	Prob.
AKENR	0.154904	0.037735	4.105033	0.0262
AKSEN	0.694428	0.044069	15.75760	0.0006
AKSUE	0.445793	0.021340	20.88995	0.0002
AYEN	0.027047	0.028453	0.950603	0.4119
ODAS	0.398885	0.037004	10.77953	0.0017

Panel results illustrate that persistence in profit is more powerful in the short run when it is compared to long run dynamics. Anyway, competitive theory claims that abnormal profit will decrease as other firms enter the market.

**Table 3. Panel Reports of Persistence of Profit**

$\hat{\lambda}$	Std. Error	t-Statistics	Prob.
Long Run Equation			
-0.036050			0.0000
Short Run Equation			
0.344211	0.116703	2.949475	0.0036
Log likelihood		-3444.073	



### **III. CONCLUSION**

A large body of research has been written over the years on profit persistence yet questions still prevail in the empirical literature. According to the Schumpeterian economy approach (1939), the companies planning to gain a competitive advantage by making innovations are able to get a monopoly power. Therefore, they can keep their profits rate above the norm for a long time in contrast to competition theory. In the process named as “creative destruction” by Schumpeter, innovations will lead to monopoly power and the power will lead to excessive profit. In this study, we examined persistence of profit in energy markets by utilizing panel ARDL methods for the period’s 2005q1-2015q3. We concluded that;

- I) While AKSEN Company in Turkey has highest PP parameter (0.69), AYEN has the lowest value of PP (0.02). Although these two companies are large firms in energy market in Turkey, their PP parameter illustrate big differences.
- II) According to panel results, in short run Persistence is more common than long run.
- III) Although there are high barriers to entry energy market, PP parameter is relatively low when we focus the PP literature.

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