Psychological Prices at Retail Gasoline Stations: Evidence from a Developing and Inflationary Country

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Abstract

Context/Purpose: Psychological price has recently played an essential role in economic actors' decision-making process. The aim of this study is to investigate the effect of Psychological Prices on retail gasoline prices in Turkiye, a developing country grappling with inflationary challenges.

- Methods: Pooled OLS and Panel Data Fixed Effects methods are applied. The raw daily data of retail prices of three big gasoline companies for 81 cities of Türkiye for the period January-2017 and August-2023 was obtained from Energy Market Regularity Authority of Türkiye and processed by the authors in a way which would serve the aim of the research.
- Results: There is a negative relationship between 9-ending prices and gasoline prices, while a positive relationship exists between 0-ending prices and gasoline prices.
- Interpretation: The results of this study are different from the results of studies in the empirical literature, which are based on the sample from developed countries. Our results do not support the Psychological Price Theory for Turkiye because of high inflation experienced during Covid-19 pandemic period.
- Conclusion: Based on the daily data of retail prices of three big gasoline companies for 81 cities of Türkiye, we were able to suggest that 9-ending prices do not serve as signals to consumers in Turkiye and, therefore, do not influence purchasing behavior because of higher inflation.

Keywords: Psychological Prices, Gasoline Stations, Developing and Inflationary Countries.

1 Introduction

Psychological price has recently played an essential role in economic actors' decision-making process. The last digit of price affects consumer purchasing decisions in a specific direction. It ends in an odd number in the last digit of the sales price [1][2][3]. For

instance, pricing an item at $19.99 instead of $20 can make it more affordable for customers. That is why many retailers tend to set prices that end in odd numbers, particularly 5 or 9 [4][5].

The central hypothesis regarding Psychological Prices is that prices ending in 0 (zero) are more expensive than prices ending in 5 or 9 [6][7]. Research indicates that product prices ending with odd numbers can influence consumer purchasing behaviors positively [8][9]. When we look at the literature, there are different studies examining the effect of Psychological Prices in the gasoline market on developed countries: [10] on the US, [11] on Italy, [12] on France. However, no research has explored the impact of Psychological Prices on developing countries. This study aims to investigate the effect of psychological prices on retail gasoline prices in Turkiye, a developing country that has recently been dealing with inflationary challenges.

2 Methods and Data

The sample in this study covers the daily retail prices of three big gasoline firms in 81 cities in Turkiye. The sample period is from January 2017 to August 2023. The data is obtained from the Energy Market Regularity Authority of Turkiye. We processed the data in a way which would serve the aim of the research.

We applied the Pooled OLS and Panel Data Fixed Effects estimation techniques. Fixed effects models can account for unobserved heterogeneities and provide more accurate estimates of the model parameters. They are particularly useful in panel data settings where there is a combination of cross-sectional and time series data.

3 Results

Tables 1 and 2 report the pooled OLS and panel fixed effect test results for firm A, respectively. Pooled OLS test results indicate that 0-ending prices have a positive and statistically significant effect on gasoline prices, while 9-ending prices have a negative and statistically significant effect on gasoline prices. Panel fixed effect test results show that 0-ending prices have a positive and 9-ending prices have a negative impact on gasoline prices.

Table 1. Pooled OLS Results – Firm A

variables	Gasoline Prices	Gasoline Prices
0-ending price		0.127598**
5-ending price	2.689559***	2.70567***
9-ending price	-0.212633***	-0.1965223***
Constant	10.13798***	10.12186***
Observations	179,608	179,608

*** p<0.01, ** p<0.05, * p<0.1	

Table 2. Panel Fixed Effect Results – Firm A

variables	Gasoline Prices	Gasoline Prices
0-ending price		0.1181931
5-ending price	2.597822***	2.613637***
9-ending price	-0.176686	-0.1614066
Constant	10.14008***	10.12506***
Observations	179,608	179,608
*** p<0.01, ** p<0.05, * p<0.1		

Tables 3 and 4 present the findings obtained from pooled OLS and panel fixed effect tests for firm B, respectively. According to test results, 0-ending prices are negatively associated with gasoline prices, whereas 9-ending prices are positively associated with gasoline prices but statistically insignificant.

Table 3. Pooled OLS Results - Firm B

variables	Gasoline Prices	Gasoline Prices
0-ending price		-0.3326985***
5-ending price	2.397543***	2.352502***
9-ending price	0.0585705	0.0135295
Constant	10.13212***	10.17716***
Observations	181,906	181,906
*** p<0.01, ** p<0.05, * p<0.1		

Table 4. Panel Fixed Effect Results – Firm B

variables	Gasoline Prices	Gasoline Prices
0-ending price		-0.3001703**
5-ending price	2.349736***	2.306958***
9-ending price	0.0899034	0.048973
Constant	10.13168***	10.1725***
Observations	181,906	181,906
*** p<0.01, ** p<0.05, * p<0.1		

Tables 5 and 6 indicate the pooled OLS and panel fixed effect test results, respectively. Pooled OLS and panel fixed effect test results prove that 0-ending prices have a positive and statistically significant effect on gasoline prices, while 9-ending prices have a negative and statistically significant impact on gasoline prices.

Table 5. Pooled OLS Results - Firm C

variables	Gasoline Prices	Gasoline Prices
0-ending price		0.3764313***
5-ending price	3.008545***	3.046971***
9-ending price	-0.205325***	-0.166899***
Constant	10.41901***	10.38059***
Observations	172,316	172,316
*** p<0.01, ** p<0.05, * p<0.1		

Table 6. Panel Fixed Effect Results – Firm C

variables	Gasoline Prices	Gasoline Prices
0-ending price		0.3831498***
5-ending price	2.699167***	2.739925***
9-ending price	-0.1356817	-0.0977745**
Constant	10.43102***	10.39195***
Observations	172,316	172,316
*** p<0.01, ** p<0.05, * p<0.1		

4 Discussion

We examined the impact of psychological prices at retail gasoline stations on Turkiye covering the period from January 2017 to August 2023. Pooled OLS and Panel Fixed Effect test results show a negative relationship between 9-ending prices and gasoline prices, while a positive relationship exists between 0-ending prices and gasoline prices.

Our results do not support the Psychological Price Theory for Turkiye. The results of this study are different from the results of [10], [11], [12], which are based on the sample from developed countries.

Figure 1 portrays the trajectory of inflation rates across Turkiye, the Euro Area, and the OECD in the aftermath of the 2008 Global Financial Crisis. Commencing in 2016, Turkey witnessed a modest inflation rate of approximately 8%, which subsequently escalated in 2017. Prior to the onset of the COVID-19 pandemic, Turkey grappled with inflation, registering a rate of 15.18% in 2019, which surged to nearly 20% by 2021. However, Central Bank of Republic of Turkiye gave up on supporting the price stability target implemented since 2002 by using policy tools based on short-term interest rates in spite of the environment, including both high deprecation in Türkiye's national currency and increasing inflation in 2021. In 2022, the inflation rate in Turkiye reached its top point, 72.31%. Compared to Euro Area and the OECD, the inflation rate was relatively higher in Turkiye in 2023.

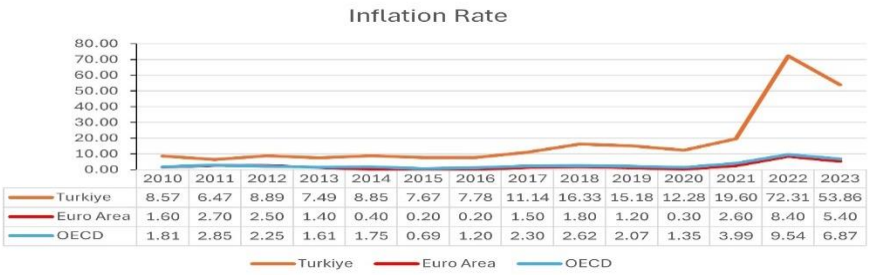

Fig. 1. Inflation Rate (Resource: OECD, 2024)

5 Conclusions

This study aimed to investigate the effect of Psychological Prices on Turkiye. 0-ending prices are positively associated with gasoline prices, whereas 9-ending prices are negatively associated. We were able to suggest that 9-ending prices do not serve as signals to consumers in Turkiye and, therefore, do not influence purchasing behavior because of higher inflation. Our study helps add to the literature on the effect of psychological prices on developing countries.

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