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

36 instance, pricing an item at $19.99 instead of $20 can make it more affordable for cus-
37 tomers. That is why many retailers tend to set prices that end in odd numbers, particu-
38 larly 5 or 9 [4][5].
39
40 The central hypothesis regarding Psychological Prices is that prices ending in 0
41 (zero) are more expensive than prices ending in 5 or 9 [6][7]. Research indicates that
42 product prices ending with odd numbers can influence consumer purchasing behaviors
43 positively [8][9]. When we look at the literature, there are different studies examining
44 the effect of Psychological Prices in the gasoline market on developed countries: [10]
45 on the US, [11] on Italy, [12] on France. However, no research has explored the impact
46 of Psychological Prices on developing countries. This study aims to investigate the ef-
47 fect of psychological prices on retail gasoline prices in Turkiye, a developing country
48 that has recently been dealing with inflationary challenges.

49 2   Methods and Data

50 The sample in this study covers the daily retail prices of three big gasoline firms in 81
51 cities in Turkiye. The sample period is from January 2017 to August 2023. The data is
52 obtained from the Energy Market Regularity Authority of Turkiye. We processed the
53 data in a way which would serve the aim of the research.
54
55 We applied the Pooled OLS and Panel Data Fixed Effects estimation techniques.
56 Fixed effects models can account for unobserved heterogeneities and provide more ac-
57 curate estimates of the model parameters. They are particularly useful in panel data
58 settings where there is a combination of cross-sectional and time series data.

59 3   Results

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

66   **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

67   **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

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

72   **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

73   **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

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

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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		

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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		

80 ## 4   Discussion

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

85

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

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

References

1. Karoubi, B., & Chenavaz, R. Prices for cash and cash for prices? Theory and evidence on convenient pricing. Applied Economics, 47(38), 4102-4115 (2015).
2. Wieseke, J., Kolberg, A., & Schons, L. M. Life could be so easy: the convenience effect of round price endings. Journal of the Academy of Marketing Science, 44(4), 474-494 (2016).
3. Chenavaz, R., Drouard, J., Escobar, O. R., & Karoubi, B. Convenience pricing in online retailing: Evidence from Amazon. com. Economic Modelling, 70, 127-139 (2018).
4. Gendall, P., Holdershaw, J., & Garland, R. The effect of odd pricing on demand. European Journal of Marketing, 31(11/12), 799-813 (1997).
5. Snir, A., Levy, D., & Chen, H. A. End of 9-endings, price recall, and price perceptions. Economics Letters, 155, 157-163 (2017)
6. Manning, K. C., & Sprott, D. E. Price endings, left-digit effects, and choice. Journal of Consumer Research, 36(2), 328-335 (2009).
7. Kleinsasser, S., & Wagner, U. Price endings and tourism consumers' price perceptions. Journal of Retailing and Consumer Services, 18(1), 58-63 (2011).
8. Anderson, E. T., & Simester, D. I. Effects of $9 price endings on retail sales: Evidence from field experiments. Quantitative Marketing and Economics, 1(1), 93-110 (2003).
9. Guéguen, N., & Jacob, C. Price and Consumer Behavior: An Evaluation in a New Context. Journal of Applied Sciences, 5(2), 383-384 (2005).
10. Lewis, M. S. Odd prices at retail gasoline stations: focal point pricing and tacit collusion. Journal of Economics & Management Strategy, 24(3), 664-685 (2015).
11. Alderighi, M., & Nicolini, M. Third decimal place odd prices trigger competition: evidence from the Italian retail gasoline market. Applied Economics Letters, 26(2), 143-146 (2019).
12. Huck, N., Chenavaz, R. Y., & Dimitrov, S. Psychological prices at retail gasoline stations: the policies of 0-, 5-, and 9-ending prices. Applied Economics, 53(48), 5584-5598 (2021).