

GASOLINE AND ETHANOL PRICES IN BRAZIL: COMPETITION, PRODUCT QUALITY AND GAS STATION CHARACTERISTICS

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Overview

The fuel retail sector in Brazil is a particular case compared to other countries. First, there is a difference between gasoline and diesel consumers. On the one hand, gasoline-powered cars are mostly for personal and/or family use. Therefore, they are characterized by a large number of small consumers. On the other hand, the diesel market is constituted, almost entirely, by vehicles with an economic purpose aimed at mass transport, whether of people (buses) or goods (trucks). In this case, there is a relevant amount of large consumers.

Second, there is ethanol as a widely spread fuel. Since the 1970s, the Brazilian government has invested in promoting ethanol as an alternative to gasoline, especially in a period marked by the Second Oil Shock. Thus, consumers could make their technological choice and opt to buy cars powered by gasoline or ethanol. Hira and Oliveira (2009) point to the success of the ethanol promotion policy through Brazil's consolidated position in relation to the rest of the world. Currently, the country is the largest ethanol exporter together with the United States, in addition to being a technological and productive pioneer.

Another important mark is the advent of flex-fuel cars in 2003. These vehicles run on both gasoline and ethanol. Currently, the share of flex-fuel cars in the Brazilian fleet is over 80%. Thus, it is possible for the consumer to choose the fuel at the pump. In this context, there is substitutability and, consequently, a competition between gasoline and ethanol. Most of the time, consumers opt for the cheapest fuel. Furthermore, due to an addition mandate, the gasoline sold at the pump is composed of 27% anhydrous ethanol and 73% pure gasoline. The objective of this addition mandate is to contribute to the reduction of the participation of fossil fuels in the Brazilian energy matrix. So, fuel retail aimed at small consumers in Brazil is made up of gasoline and ethanol.

Therefore, this article aims to understand which factors can influence the formation of resale prices for gasoline and ethanol during the period 2014-2018. Part of the data used is unprecedented so that the results can serve as a basis for the formulation of public policies aimed at stimulating competition and reducing the prices paid by consumers.

Methods

In the economic literature, different approaches are used to understand the determination of prices at the pump. However, the ones that stand out the most are: (i) location of the gas station and concentration of competitors (Perdiguero and Borrell, 2018); (ii) degree of product differentiation or perceived quality, through the branded gas stations (Bello and Cavero, 2008); (iii) formation of cartels (Silveira et al, 2021); and (iv) substitutability between gasoline and ethanol (Pessoa et al, 2019), which is a particularity of the Brazilian case.

The empirical analysis seeks to identify the relevance of competitive, regional aspects and the perceived quality, on the part of consumers, of gas and ethanol service stations, in the formation of their prices. Thus, the methodology used was the panel data model, according to Equation (1) for gasoline and Equation (2) for ethanol:

$$Price_{it} = \beta_0 + \beta_1 Cost_{it} + \beta_2 Branded_{it} + \beta_3 Exclusivity_{it} + \beta_4 Competitors_{it} + \beta_5 Age_{it} + \theta_i + \alpha_i + \gamma_i + \delta_i + \varepsilon_{it} \quad (1)$$

$$Price_{it} = \beta_0 + \beta_1 Cost_{it} + \beta_2 Branded_{it} + \beta_3 Exclusivity_{it} + \beta_4 Competitors_{it} + \beta_5 Age_{it} + \varphi_i + \alpha_i + \gamma_i + \delta_i + \varepsilon_{it} \quad (2)$$

Where: the subscript i represents the reseller station and the subscript t , the time in years; β s are the parameters to be estimated; θ represents the fixed effects of the gas station also selling ethanol; α captures the fixed effects of tanking; γ , the fixed effects of the number of pumps of a gas station; δ , the fixed effects of the federation unit; φ are the fixed

effects of the reseller station being located in an ethanol-producing unit of the federation; and ε is the random error term.

Results

The results show that, in terms of fuel quality, especially about branded gas stations and exclusivity contracts, the findings were different from those previously obtained in the literature (Bello and Cavero, 2008; Pinto and Silva, 2008). For both gasoline and ethanol, although the exclusivity contracts make the purchase of fuels from distributors more expensive, the brands influence negatively on final prices.

Another result refers to the number of competitors in a retail station. For ethanol, competition is positive. The price decreases as there are more competitors in a given location. For gasoline, the scenario is the opposite. The signal found indicates that the greater the number of stations located nearby, the higher the prices. This could be an indication of collusion in the resale of gasoline. In addition, the age of a station can positively influence fuel pricing. Older gas stations have a certain degree of market power because of search costs. Sometimes it is easier for the consumers to refill their tanks in the same gas station instead of searching for a new one. This result is valid for both gasoline and ethanol.

Conclusions

The findings of this work can serve as inputs for the elaboration of public policies. The first and most important contribution is related to reinforcing the need for strong and joint action by the regulator (National Agency for Petroleum, Natural Gas and Biofuels) and competition defense agency (Administrative Council for Economic Defense), given the signs of the cartel.

The second is to promote measures that bring more transparency to the pricing process, such as those adopted in Germany, Chile, and South Korea. In these countries, gas stations must inform their prices on a digital platform in real-time. In Chile, the compulsory disclosure of prices in apps allowed the local regulator to detect and punish cartels. In the other countries, it eliminated the searching costs for consumers and intensified the competition, resulting in lower average prices.

Last but not least, it is necessary to discuss policies that strengthen the consumption of ethanol. One possible alternative is to subsidize ethanol. These policies are relevant to mitigating the emission of carbon dioxide into the atmosphere.

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