Regional trends in Brazilian market of ethanol between 2000 and 2009.

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Introduction

The research consists of an exploratory and comparative analysis about the regional and national markets for ethanol in Brazil. The study covered the period between 2000 and 2009 and observed trends in supply and demand. During this period there was a growth in the sales of flex fuel cars. This technology allows the consumer to use either ethanol or gasoline C (a mix of gasoline and ethanol).

Results and Conclusions

At a national level, in this period, we observed a growing demand for automotive fuels in general. This evolved from approximately 27,200 M^3 in 2000 to 41,900 M^3 in 2009 (an increase of 53.8%). Gasoline C is the most demanded type of fuel in the market. However, its participation declined from 82% in 2000 to 58% in 2009. The demand for ethanol increased from about 4,600 M^3 in 2000 to 16,500 M^3 in 2009 (an increase of 268%). The market share for ethanol increased from 17% in 2000 to 38% in 2009.

Furthermore, in this period, ethanol prices were more competitive than those for gasoline. This explains the growth in the demand for this fuel. E.g. in 2009 the average ethanol consumer price represented approximately 60.7% of price of the gasoline. To be advantageous, the ethanol consumer price must represent a maximum of 70% of the gasoline price.

At a regional level, the research identified a concentration in the demand for liquid fuels. In 2009, the national share of the Southeast region demand for these fuels was 54.2%. In this region São Paulo state alone answered for 67.4% of the fuel demand. With the influence of São Paulo, this region reported a decrease in gasoline demand and a strong growth in ethanol demand. In São Paulo, the demand for ethanol exceeded the demand for gasoline in 2009 (56.2% and 43.7% respectively). In the remaining states in the region, we observed that the demand for gasoline was larger than the demand for ethanol. It was found more favorable prices in relation to ethanol in São Paulo in comparison to other states.

In the South, representing 17.6% of the domestic market in 2009, gasoline was the market leader. It accounted approximately 72% of fuel consumption in this year. In spite of this fact, we identified a considerable rise (of 154%) in the consumption of ethanol between 2000 and 2009. The Paraná state was the main responsible for this increase. Relative prices in the Paraná were more favorable to the ethanol compared to other states.

In the Northeast, representing 13.5% of the domestic market in 2009, gasoline was again the market leader. It accounted for approximately 72% of fuel consumption in this year. There was also a growing demand for ethanol (of 266%) in the 2000-2009 period. Bahia state, the largest market in the region, answered for 28% of its consumption. This state experienced the largest increase in ethanol demand.

In the Midwest, representing 9.6% of the domestic market in 2009, there is a substantial increase in the demand for ethanol in relation to gasoline. Goiás and Mato Grosso states have showed the largest increase in the demand for ethanol relatively to gasoline. In the state of Mato Grosso, ethanol has exceeded the demand for gasoline in 2009. In Mato Grosso, we observed the most favorable relative prices in region of the ethanol in comparison to the gasoline.

The North, representing 4.5% of the domestic market in 2009, is characterized by a bigger rate of demand growth for fuel than the national average. The gasoline responded for approximately 86% of fuel consumption in 2009. Relative prices favoured gasoline in this region.

Analyzing the supply of ethanol, the South-east has also the largest concentration in Brazil (a participation rate that increased from 67.6% in 2000/01 to 70.12% in 2008/09). São Paulo is the largest producer in the region and in the country, representing about 86.6% of the Southeast and 60.8% of the national production in 2008/09. The second largest producer in the region was Minas Gerais (a participation that increased from 6.76% in 2000/01 to 11.23% in 2008/09).

The Midwest region was the second largest producer in the country, contributing with approximately 13.64% in 2008/09. The region has the highest growth rates in production (242% in the period). Goiás state is the largest producer in the region, participating with approximately 46% in 2008/09 (compared to a share of 29% in 2000/01). Mato Grosso do Sul contributed with 28.6% of the region's production in the 2008/09, approximately the same proportion that occurred in the beginning of the period. The participation of Mato Grosso decreased from 42.3% in 2000/01 to 25.36% in the 2008/09.

The North-east was the third largest producer, with approximately 8.5% of national production in 2008/09. A decrease in comparison to 2000/01, when the region contributed with approximately 14%. The Alagoas state is the largest producer of ethanol, representing approximately 36% of the region's production in 2008/09. This represents a decrease in comparison to its participation of 42.2% in 2000/01.

In the South, the Paraná state responds almost entirely by production of the region. It responded for about 7.5% of the national production in 2008/09, approximately the same proportion reported in 2000/01. The North has marginal participation in ethanol production.

The research has observed that the states that registered the most significant rates in the demand growth for ethanol are largely also the main suppliers. In these states relative prices have been advantageous to ethanol.

It becomes necessary, for future research, to examine if the benefits of ethanol relative prices result from the logistical advantage of proximity between supply and demand. An alternative explanation would be that the advantage stems from the favorable tax policies at the state level on ethanol in comparison to tax policies on gasoline. In such case, the governments at the state level could be stimulating the demand for a local product.

Supported by FCAV-UNESP-JABOTICABAL, Brazil.

Author publications

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