

BBEST – Recent Evolution of Sugarcane Industry: 10 years of competition and growth

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Introduction

Brazil has stood out as a great producer of bioethanol. Traditionally a sugar producer and leader in this product exports in the international market, the country now faces the double challenge of escalating the offer of bioethanol for the increased demand of flex-fuel vehicles and meeting a possible demand from countries interested in reducing their dependence on petroleum derivatives. Can Brazil honor its promise of meeting the international demand for sugar, increasing the bioethanol offer for the expanding market of anhydrous and hydrated alcohol in Brazil and, on top of it, exporting to the United States and other countries in case the international market is liberalized?

The main goal of this article is to answer these questions through a thorough analysis of the offer, accentuating the evolution of the Brazilian sucro-energetic industry's productive offer between the 1999/2000 and 2008/2009 crops, as well as the research and economic indicators constructed by the investigators of IE-UFRJ's INFOSUCRO (www.ie.ufrj.br/infosucro).

Besides, presenting and analyzing the data on the production and productivity of sugarcane, alcohol and sugar, this article shall also analyze the industry's competitive performance through its structural components, exhibiting concentration indicators, which shall also be compared to the industry's patrimonial structure. To this end, we shall provide a description of the mergers and acquisitions that occurred in the decade, further explored through a turnover study. Finally, we shall present comments on the main technological changes that have already been adopted or that, once introduced, may modify the outline of bioethanol production.

Methodology and Data

Initially, we shall present indicators of agricultural productivity associated with the production of sugarcane "within farm gates". We shall also present data related to the production at the next level, that is, industrial processing, using sugar and alcohol production data. The productivity indicator used at the

industrial level is the ART, the former sucrose content¹. Finally, we shall present data on the end demand for sugar and alcohol. The analysis on market concentration is an empirical study based on the theories of market structure applied to the sucro-energetic sector with the goal of understanding how this sector is structured behaves through time. Such analysis consists in separating agroindustrial units into economic groups to which such units belong, and then adding up the sugarcane, sugar and alcohol production of each industrial unit, providing the total production of each group. The concentration analysis is based on the production of 203 sucro-energetic economic groups and 331 productive units from the Mid-South, that is, the study analyzes the productive units located in the South, Southeast and Mid-West regions, which represent 89% of the Brazilian sugarcane production. The empirical analysis of concentration is based to the Concentration Ratios (CR's), whereas the present article used CR(4), CR(10) and CR(20), as well as the Hirschman-Herfindahl (HHI) ratio (Ferguson&Ferguson,1994)².

Using production data as well, the article presents a turnover analysis (JOSKOW, J. 1960)³. This analysis shall further explore the concentration analysis, allowing the examination of “the possibilities of employing one such supplementary indicator a measure of shifts in the relative positions of firms within an industry”. More specifically, the analysis allows the observation of the *behavior* of business groups and independent companies through the viewpoint of companies' dislocation through business groups in two moments in time, which are here the beginning and the end of the aforementioned series, that is, the crops of 1999/2000 and 2008/2009.

The turnover methodology at first is based on enumerating the companies in decreasing order according to the chosen variable and in the chosen year; the companies then are distributed through equal classes, respecting the pre-established order of magnitude. We should point that this last methodology allows the observation of the dislocation of companies through business classes and groups, complementing thus the concentration study. Therefore, we may have a picture of companies' positioning shifts within the classes between two moments in time. Finally, the article shall describe the trend of technological innovations and appraise how these innovations may result in productivity trends and production increase. This description shall refer to the research and articles produced by INFOSUCRO-IE/UFRJ investigators.

¹ ART: Açúcar Reduzido Total

² FERGUSON,P.R.&FERGUSOG.J.Industrial Economics,1964,MacMillan, Lancaster.

³ JOSKOW, J. The Review of Economics and Statistics, Vol. 42, No. 1 (Feb., 1960), pp. 113-116. Published by: The MIT Press. Stable URL: <http://www.jstor.org/stable/1926106> Accessed: 14/07/2010 14:44

In brief, the proposed article gathers a cluster of information and indicators of cyclical and seasonal nature and discusses them in the context of an analysis on the competitive standards of the sucro-energetic industry. This way, we seek to appraise whether the main competitive advantages of this industry allow sustaining the increase of both the internal demand for bioethanol and the external demand, without forsaking the comparative advantages already obtained in the production of sugar.

Results

The analysis of the land productivity shows an increasing trend along the decade, until 2007/2008. Since then, there is a clear lost of efficiency. Besides, the investigation clearly associates yields obtained at the farm level and the industrial ART indicator. Through concentration studies we can obtain indications as to the competitiveness degree of the sucro-energetic industry. We may thus anticipate that the study does not show an accentuated tendency of concentration in the industry, at least until the 2008/2009 crop. Comparing the concentration indicators crop after crop, one may notice just a slight concentration tendency, measured through CR-4 and CR-8. However, a more expressive concentration is not confirmed by HHI, which is the most universally accepted indicator among economists. The turnover analysis reveals further than the perception of an important increase in mergers and acquisitions in the period: this trend was not detected only between large-sized entrant companies and small or medium-sized incumbents ones, but also between these small and medium-sized established companies, which grants yet another dimension to the movement of business consolidation in the analyzed period.

Author Publications

FONSECA, M.G.D. & PIKA, A. (2011) Catching up, Spillovers and Innovation Networks in *Journal of Evolutionary Economics*, Vol.21. pp.1-10.
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