Market share in Brazil: a case study of food and beverage industry

Fabrício José Piacente
CEETEPS/UNIANCHIETA
fjpiacente@bol.com.br

Vanessa de Cillos Silva
CEETEPS

Pâmela Cristina Moretti
CEETEPS

Denys Eduardo Biaggi
CEETEPS

Abstract
This study evaluated the concentration’s degree in food and beverage industry, calculating and analyzing Concentration Ratio indicators and Hirschman-Herfindahl Index. Between 1996-2010, CR4 remained stable; CR8 increased 0.6%; and HHI grew 37.5%. For 2011-2013, CR4 increased 23%; CR8 9.5%; HHI index 33%, confirming the concentration pattern for the sector.

Keywords: Mergers and Acquisitions (M&A), competition pattern, Food and Beverage industry.

INTRODUCTION

The food and beverage industry in Brazil collaborated with approximately 10% of the total Gross Domestic Product (GDP) in 2014, profited more than US$ 195 billion, with US$ 155.5 billion in food an US$ 40 billion in beverages, an amount that classifies the sector as the second largest grossing in transformation industry production in the country. In 2014, there were approximately 33 thousand companies in the country which were responsible for a volume of US$ 44.1 billion in exports, contributing to a positive balance of more than US$ 35.4 billion (Abia, 2015).

The 1990s experienced institutional changes that impacted industrial organization of Brazil and generated important unfoldings. Modifications of the concept of national companies enabled increased participation of foreign capital in Brazilian industrial complexes. Flexibilization of
public monopolies and privatization enabled increased participation of private sector in sectors where until that time, production or subcontracting services was predominantly done by the State. These institutional transformations, connected to consolidation of price stability, create a favorable environment for investment internally as well as externally. The food and beverage industry stood out in this context. Great potential for growth of domestic demand during the second half of the 1990s, boosted by the nation program for price stabilization (Real Plan), was an important motivator for new investments in the sector, boosting mergers and acquisitions (M&A) which elevated the degree of sector concentration in following years.

The main objective of this research is to verify how, from 1996-2003, the favorable scenario for fusions and acquisitions (M&A) in the food and beverage industry combined for significant growth in the degree of concentration of this market.

LITERATURE REVIEW

Conceptually, mergers are understood as the fusion of two or more companies into one, and by acquisition, holding purchases of an existing company without entailing total control of company’s holding property, or even change in corporate entity (Miranda and Martins, 2000).

In Brazil, in compliance with Corporate Law (Law 6404/76), article 227, acquisition or incorporation presents “operation by which one or more companies are absorbed by another which then succeeds to all rights and obligations of the absorbed companies”. Article 228, merger is considered “operation by which one or more companies united form a new partnership which then succeeds to all rights and obligations of the absorbed companies”.

Classification processes of mergers and acquisitions can be horizontal, vertical or conglomerate. Horizontal classification refers to the union of active firms in the same field, generally that compete with each other. Vertical, union of firms that are part of the same production chain and conglomerate, involve firms from unrelated activities aiming to diversity investments (Ross, Westerfield and Jaffe, 2002; Weston and Brigham, 2000; Wright, Kroll and Panell, 2000).

The main motives that lead companies to the process of merging and acquisition are: i) different expectations about future lead investors to attribute different values than companies, provoking purchase proposals; ii) tributary compensations and incentives coming from tributary credits relative to damage accumulated by one of the companies involved in profits of future exercises of the other company, in accordance with percentages permitted by Brazilian legislation; iii) replacement costs and market values characterized by when a company’s assets are greater than its market value; iv) search for economies of scale (operational and managerial synergies) derived from possible cost reductions due to increase in production, greater rationing of R & D (Research and Development), efforts among others (Mitchell and Mulherin, 1996).

Goughan (2004) identified that processes of market deregulation are one of the main motivating factors of merger and acquisition waves or cycles. In a specific study carried out in 2003, the author found that approximately 51% of analyzed M&A cases are connected to competitive or strategic mergers, highlighting that the rate of production sector acquisitions and standards is directly related to shock economics.

Beena (2000) analyzed characteristics of different processes of mergers and acquisitions in India during the period of 1972-1973 to 1994-1995. The author observed that liberalization of the Indian economy and removal of other regulatory barriers help increase the rhythm of
mergers, significantly contributing to growth in assets of the involved firms, and increase in degree of market concentration.

It can be affirmed that in Brazil, the increased number of mergers and acquisitions accompanied the process of economic liberalization because of three main reasons. First, due to globalization aligned with deregulation of local markets, permitting acquisition of Brazilian companies by foreigners. The second reason was due to the privatization process which enabled national and international firms to acquire large operations in energy, telecommunication and banking sectors, and finally, elevated international competition associated with rapid technological transformation that demanded national companies merge or acquire one another (Wood, Vasconcellos and Caldas, 2004).

In one study about experiences and strategies of fusions and acquisition in Brazil, Deloitte (2006) selected 204 companies with earnings over 50 million reais, that operated in the country and that had already gone through the process in the past five years or that didn’t but was able to include this strategy in its business plan. As a result of the study, it can be concluded that: 95% of the companies had already gone through the merger and acquisition process; 47% of their operations here actually functioning in the Brazilian market; 66% had the objective of acquiring the entire capital of the target company; 56% of merged or acquired firms possessed family management and control; 18% consisted of subsidiaries of foreign multinational companies; and just 8% had stocks. Finally, the study pointed out that target companies of merges and acquisitions in Brazil, are chosen based on their sector of operation, similar or complementary to the acquiring companies, a recommendable strategy in order to minimize risks and for market share growth, showing organizations’ search for increased market share and creation of entrance barriers.

It can be generally noted that merging and acquisition (M&A) processes are inserted in firms’ formulation of competitive strategies, necessarily conducting understanding about interaction between the company and its competitors, even considering specific conditions (production and market technologies) of industry and general economic environment. (Kupfer, 1992).

To sum it up, concepts of efficiency and performance have to be treated complementarily, being that firms plan their investments based on market expectations in search of greater efficiency and only at a later time, will performance be known

**METHODOLOGY**

In relation to measuring concentration indices, indicators are used that follow three criteria: production capacity, number of employees and assets. Production capacity can be related to the physical quantity of production, or monetary value (sales amount, value added). To analyze the concentration degree of companies in Brazil’s food and beverage industry, Concentration Ratio \((CRk)\) and Hirschman-Herfindahl Index \((HHI)\) were used.

The Concentration Ratio \(CRk\) with order \(k\) is a positive indicator that supplies a share of the market of the \(k\) largest companies in the industry \((k = 1,2,\ldots,n)\), on what \(Y_i\) represents a share of the market of \(i\)-ésima firm of total market. This indicator (Equation 1) considers the same degree for all companies like this:

\[
CR_k = \sum_{i=1}^{k} Y_i
\]  

\[(1)\]
The greater the index, the greater the market power exercised by the \( k \) largest companies. This study uses \( k=4 \) and \( k=8 \), in other words, it only considers the participation of the four or eight largest companies. The respective concentration ratios are known as \( CR(4) \) and \( CR(8) \).

In order to perform an analysis of such indices, the market classifications proposed by Bain (1968) which analyzes market concentration using the four largest companies of the sector, and in this way, classifies the markets in: i) \( CR(4) \) equal or greater than 75%: highly concentrated oligopoly; ii) \( CR(4) \) between 50% and 74%: moderately concentrated oligopoly; iii) \( CR(4) \) between 25% and 49%: not very concentrated oligopoly; iv) \( CR(4) \) lower than 25%: atomistic.

As the Concentration Ratio (CR) shows some limitation, being that in a given period, there can be changes between the \( k \) largest companies that make other measures necessary to eliminate this inefficiency, therefore, in addition to \( CR(k) \), Hirschman-Herfindahl Index (HHI) was used in the research which is obtained by adding squares of individual participations of each firm as in Equation 2.

\[
HHI = \sum_{i=1}^{n} (\frac{\text{REVENUE}_i}{\text{REVENUE}_{\text{TOTAL}}})^2
\]

Equation 2 shows the implicit weight structure \( HHI \) in which each market parcel elevates itself to the square to attribute greater weight to relatively larger companies. In this way, the bigger the \( HHI \), the more elevated the concentration will be and therefore, lower the competition between producers. \( HHI \) varies between \( 1/n \) and 1. The upper limit of the index is associated with the extreme case of monopoly where just one company operates in the market. The lower limit derived from \( HHI \) is a convex function defined in the simplex: \( \{S_1 = 0, \ldots, S_{n-1} = 1\} \). Therefore, the index assumes the minimum value for \( HHI = 1/n \) for \( S_1 = S_2 = \ldots = S_n \), that is, when all companies have the same size \( (S_1 = 1/n) \). So, we have: \( 1/n \leq HHI \leq 1 \).

In relation to the \( HH \) index, according to its variation (between \( 1/n \) and 1), it’s possible to verify the concentration degree of the market because the closer it is to \( 1/n \), the lower the concentration; the closer to 1, the more concentrate the industry.

Despite the previous classification, it should be pointed out what was most important in the analysis of such indices is its temporal evolution, i.e. its dynamic character with these occurring in annual intervals for the \( CR(k) \) index, as well as \( HHI \) because these will have greater representation when analyzing their evolution in such a way that observes their trend.

Based on this focus, the variable used to construct concentration indicators was volume of gross and net revenue from sales in monetary values (US$) depending on the series of data available for analysis. The period of analysis was 1996-2013 and divided into two parts.

The first, from 1996 to 2010, where concentration indicators (CRK and HHI) were calculated from gross sales figures, with secondary data obtained from the annual "Best and Biggest", published by Exame magazine (in US $ millions) and the Annual Industrial Research (PIA) publication by the IBGE (R$ billions). Data from the annual "Best and Biggest" points ranking the largest companies with operations in Brazil for various segments, including sector analysis (food and beverage) and the IBGE present consolidated data of gross revenue from stratified sales for all sectors of the economy. In order for a comparison of the data to be possible, gross sales values in Brazilian reais (R$) were deflated for the year 2013 using the IPCA Price Index (Broad Consumer) and converted into US dollars at a rate R $ 2.3416, as EXAME (2014). For this period, sales data were called gross sales.

In the second part, values between the years 2011 and 2013, the concentration indices were calculated from net sales of secondary data (US$ millions), since the annual "Best and Biggest"
of Exame magazine went on to disclose this data instead of the gross sales. The consolidated value of the food and beverage industry for the period in question was obtained from the (ABIA) Brazilian Association of Food Industries database (R$ billions, 2013) and converted into dollars at a rate R$ 2.3416.

RESULTS AND DISCUSSION

Brazil’s food and beverage sector stood out in mergers and acquisitions transactions (M&A) with 776 operations between 1994 and 2013, ranking second in the national ranking. It can be noted that trade liberalization in which the country went through during the 1990s contributed to the growth of these numbers, improving the economic scenario which allowed the entry of new multinational firms in that market.

Due to the high number of transactions involving companies from the food and beverage industry in Brazil during the study period, it was decided to analyze the concentration degree of the industry in order to characterize its market structure. Therefore, the following indicators were used: i) the concentration ratio ($CR_k$), specifically $CR4$ and $CR8$; ii) Herfindahl-Hirschman and Index ($HHI$). These are the two indices most employed by antitrust authorities for individual cases of mergers and anti-competitive conduct.

On the use of "competition indicators", the Copenhagen Economics report points caveats, it says there is no indicator that faithfully shows the intensity of competition, because it is a complex, multidimensional and dynamic phenomenon. However, the report cites the main indicators that may reflect different parts of this complexity, among them stands out: concentration, barriers to entry, sectorial mobility, innovation, prices, profits, productivity and product quality (CADE 2014).

Tables 1 and 2 show the $CR4$, $CR8$ and $HHI$ indices calculated based on sales (US $ million) from the largest companies in the food and beverage sector in Brazil, stratified, respectively for the periods 1996-2010 and for 2011 to 2013. The results indicate that in the first period, 1996 and 2010, the concentration ration ($CR_k$) remained practically stable. The participation of the four largest companies in the industry ($CR4$) went from 17.41% in 1996 to 17.18% in 2010, representing a decrease of approximately 1.3% for the period analyzed. Regarding the participation of the 8 largest companies ($CR8$), the values increased from 25.91% to 26.06% between 1996 and 2010, an increase of approximately 0.6% for the period. Despite the apparent stability indicated by the intervals shown in the Concentration Degree, in both cases, the HHI does not confirm this trend stability for the period, a variation of 0.008 to 0.011, representing a growth rate of more than 37 % for the period.

It is important to note that, despite the small decline in $CR4$ index (1.3%), the food and beverage sector as a whole showed an increase in concentration, evidenced by the $HHI$ values. This can be explained by the fact that the concentration ratio only takes into account the largest companies in the sector for its calculation while $HHI$ captures any change in market concentration, giving greater weight to larger companies.
Table 1 - Concentration indices for food and beverage sector from 1996 to 2010

<table>
<thead>
<tr>
<th>Year</th>
<th>Nestlé</th>
<th>Brahma</th>
<th>Bunge</th>
<th>Santista Alimentos</th>
<th>Solida</th>
<th>Cargill</th>
<th>Spal</th>
<th>Parmalat</th>
<th>Perdigão</th>
<th>Heineken (Kaisers)</th>
<th>Food Industry</th>
<th>CR4</th>
<th>CRS</th>
<th>HHI</th>
</tr>
</thead>
<tbody>
<tr>
<td>1996</td>
<td>7.465</td>
<td>5.695</td>
<td>3.247</td>
<td>3.002</td>
<td>2.676</td>
<td>2.489</td>
<td>2.261</td>
<td>2.644</td>
<td>1.783</td>
<td>1.719</td>
<td>111,457</td>
<td>17.41%</td>
<td>25.91%</td>
<td>0.00839</td>
</tr>
<tr>
<td>2000</td>
<td>7.921</td>
<td>3.957</td>
<td>4.239</td>
<td>4.027</td>
<td>3.850</td>
<td>2.401</td>
<td>1.999</td>
<td>1.305</td>
<td>1.283</td>
<td>1.688</td>
<td>127,614</td>
<td>17.59%</td>
<td>25.65%</td>
<td>0.00103</td>
</tr>
<tr>
<td>2005</td>
<td>9.080</td>
<td>7.969</td>
<td>7.503</td>
<td>6.408</td>
<td>3.992</td>
<td>3.767</td>
<td>2.843</td>
<td>2.125</td>
<td>1.376</td>
<td>1.220</td>
<td>181,175</td>
<td>17.12%</td>
<td>24.98%</td>
<td>0.00932</td>
</tr>
</tbody>
</table>

Table 2 shows concentration data on the food and beverage industry for the second period analyzed from 2011 to 2013. Note that the share of the four largest companies calculated by CR4 increased by approximately 23%, from 18.66% to 23%; and the eight largest, calculated by CR8 was 29.48% to 32.29%, an approximate increase of 9.5%. The HHI confirmed the trend towards concentration in the sector, ranging from 0.012 to 0.016, more than 33% for the period under analysis.

Table 2 – Concentration indices for food and beverage sector from 2011 to 2013

<table>
<thead>
<tr>
<th>Year</th>
<th>Ambev</th>
<th>Bunge</th>
<th>Cargill</th>
<th>JBS</th>
<th>Sadia</th>
<th>BRF</th>
<th>Nestlé</th>
<th>Marfrig</th>
<th>Spal</th>
<th>Aurora Alimentos</th>
<th>Food Industry</th>
<th>CR4</th>
<th>CRS</th>
<th>HHI</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012</td>
<td>13.531</td>
<td>11.068</td>
<td>10.254</td>
<td>7.951</td>
<td>6.646</td>
<td>5.632</td>
<td>5.118</td>
<td>1.982</td>
<td>1.928</td>
<td>1.767</td>
<td>198,539</td>
<td>21.38%</td>
<td>29.64%</td>
<td>0.01419</td>
</tr>
<tr>
<td>2013</td>
<td>12.278</td>
<td>12.472</td>
<td>11.590</td>
<td>10.775</td>
<td>9.211</td>
<td>5.721</td>
<td>2.523</td>
<td>2.032</td>
<td>2.019</td>
<td>1.764</td>
<td>206,895</td>
<td>22.00%</td>
<td>32.29%</td>
<td>0.01611</td>
</tr>
</tbody>
</table>

Consolidating the entire period of analysis, 1996-2013, it was found that concentration measured by the three indicators confirmed the sector's concentration. CR4, market share of the four largest companies, rose from 17.41% to 23.00%; CR8 market share of the eight largest companies, from 25.91% to 32.29%; and finally the HHI which increased from 0.00839 to 0.01641.

Bunge Alimentos group was formed from the merger of Santista Alimentos and Ceval in 1996, becoming the country's largest food company. In 2000, Ambev became the largest producer of beverages in Brazil, it acquired a controlling stake in two other large national brewers Brahma and Antarctica. A similar movement of mergers and acquisitions in this sector occurred in 2011 when Sadia and Pergiã® merged creating BR Food. Note that in both cases, the process of merger and acquisition (M&A) allowed firms greater market share, expansion in sales volume and, specifically to the case of Ambev, its consolidation as leader in both revenues and market share in the food and beverage segment in Brazil.
Figure 1 shows concentration indices of CR4 and CR8, calculated for the food and beverage sector in Brazil for the period 1996 to 2013. By comparatively analyzing both indices, they appear to exhibit a similar growth trend over the period, while the CR4 grew at a rate of 1.89% per annum, CR8 grew to 1.45%. Note that in 2013 the index that measures the participation of the top 4 (CR4) firms in the segment was 23%, this value approaches participation of the eight largest (CR8) in 2005, which was 24.98%. This shows an increase in the degree of market concentration in the sector, particularly the participation of the four largest firms with Ambev, BRF, Bunge and Cargill standing out.

During the period between 2010 and 2013 that CR4 and CR8 indices had the highest growth rate, 7.98% and 11.29%, respectively per annum. This period coincides with acceleration in the process of mergers and acquisitions in which the food and beverage industry underwent after the financial crisis of 2008. As an anti-crisis policy, the Brazilian government encouraged, through availability of public funds below market price, credit lines benefiting mergers, acquisitions and corporate restructuring of firms experiencing difficulties during the crisis.

The direct impact of these measures was the restructuring of the butcheries segment in the country which led to a process of mergers and acquisitions of regional companies, confirmed increased market share of JBS, which grew from 2.67% in 2010 to 4.45% in 2013; and Marfrig which went from 0.85% in 2010 to 0.98% in 2013.

Another highlight for this period, the consolidation of the market share of this large industry groups already established as Cargill which was 3.14% in 2010 to over 5.2% in 2013; Ambev which ranged mark its share of 5.60% in 2011 to 6.17% in 2013; and Bunge rose from 3.23% in 2010 to 5.60% in 2013. Finally BRF, newly created in 2010 with 2.59% market share, rose to 6.03% in 2013, consolidating its position as a leader in the segment.

Figure 2 shows HHI evolution for Brazil’s food and drink sector for 1996 to 2013. Data reinforce the concentration already found, showing movement similar to what CRk demonstrated. Note that in 2000, there wasn’t significant growth in the CR4 and CR8 indices, HHI grew due to consider market share increase in the period 1996 to 2000 of the following companies: Brahma went from 4.46% to 6.21%; Bunge from 2.53% to 3.56%; Sadia from 2.10% to 3.16% and Cargill from 1.95% to 3.02.
Figure 3 shows data that reinforces the initial thesis and duly quantified that in the past few years, a significant increase in the concentration degree of Brazil’s food and beverage sector was observed. Note that between 2000 and 2005, the number of firms in this sector in Brazil increased approximately 36% for the entire analyzed series from 1996 to 2012, an increase of over 60%. This fact, coupled with the growth of concentration indices already identified above, confirms the conclusion of this research there is concentration in this sector since the largest firms were able to increase their relative market share, even with the sector showing a yearly increase of new firms.

It also maintains that for multinationals, the main form of entry was through mergers and acquisitions (M&A), increasing its market share by eliminating a potential competitor and still adapting quickly to its product range, already existing abroad, to local habits. The study concludes the fact that the main way of entry is through M&A modifies the competitive environment and brings as evidence the sector's concentration, with the largest share of multinationals, and the increased competition that favors price stability and intensifies the need to launch new products to maintain or increase its market share.

This large movement of multinationals entering the caused, or at least accelerated, efficiency gains in the industry concerned, upon bringing to the competitive market, organizational and production innovation so bring the competitive market organizational and productive innovations. The launch of new products and competitive strategies has become the ways in which resident companies have positioned themselves in the face of more internationalized competition.
The beverage market is usually addressed together with the food industry since both aim for human nutrition and have similar characteristics such as the importance of marketing/advertising and seasonality of some product lines. However, there are differences as the lower represented in the economy mainly due to the low value of its main raw material, water, which is generally a high proportion of the final product.

Consecutively to the low unit value of beverages, packaging becomes critical for lower prices. Essentially, it can be said that the means of distribution, advertising expenditures and packaging are crucial factors in the industry strategies.

According to BNDES (2006) study on the outlook of the beverage industry, it is characterized by the production of homogeneous goods and intended primarily for domestic consumption. Manufacturing involves little technological expertise and familiar techniques without a barrier of entry of new companies, but innovations in processes and marketing techniques are also critical for success in this market.

Nevertheless, the research points out that the apparent simplicity of entry into the beverage market collides with the high concentration of this industry, which approximates competitive oligopoly by virtue of its supply chain. Intense competition for quality, consumer preferences and tastes require high advertising expenditures, especially in a country with continental dimensions like Brazil, location of plants close to consumption centers and distribution networks to ensure arrival of the product even at most distant locations are decisive strategies of large companies.

These two variables act as barriers to entry for new competitors, leading many companies to use M&A if they need to expand their activities or increase market share. However, low production complexity and marketing possibility in small networks allow small businesses to act regionally and seize market fractions near their location.

The analysis also estimated that investments in the distribution network are approximately three times the tangible investment in the industrial plant; advertising expenditures and publicity also tend to rise in proportion to revenues. Another peculiarity of the sector is high dependence on the population's income growth because the final price of the product to the consumer is the basis of competitiveness.

**FINAL CONSIDERATIONS**

The survey found, from the calculated values of CRK and HH indices, the food and beverage sector in Brazil had an increase in the concentration degree of the companies for the period from 1996 to 2013. In 2013 the CR4 approaches CR8 of the year 2005 which shows an increase in market share of the leading companies in the industry. The increase in market share of leading firms is related to merger and acquisition transactions that have taken place in the industry. Through these operations, it is possible to obtain advantages such as economies of scope, economies of scale, management improvements and organization of business and labor.

Mergers and acquisitions of companies and, consequently, economic concentration is the expression of an element that modifies the influential exogenous environment of business dynamics. The opposite also applies. When companies, especially the best positioned in the production segment, adopt a strategy of mergers and acquisitions of competitors, they start determining new configurations of structural situation. In short, the competition trends of the sectors are modified and provoke new behaviors and performances.
In the non-durable consumer goods sector, companies should be capable of exploring all cost reduction sources to the maximum: operate technologically advanced processes, present excellence in production management, mount efficient raw material supplies and have logistics systems suitable for moving products. Since the merger and acquisition transactions are one of the fastest strategies employed by companies in search of operational and managerial, administrative and general synergies and competitive advantages.

In addition to the excellence in production and organizational efficiency the strategies developed outside the competitive market environment is of paramount importance to firms such as product diversification by income, innovative products, new products to satisfy specific markets on the rise, strengthening brands, advertising that influences consumer preferences, distribution networks, strategic partnerships, vertical economies, etc. Therefore, the managerial capacity of companies in this sector, i.e. their behavior, is of great importance to their survival.

The above procedures are within the scope of behavior and performance and often, are not enough for a reconfiguration of the existing competition standards. This is the case in the food and beverage sector in the post 90s The structure remains a competitive oligopoly. Innovation efforts on products satisfy common boundaries.

However, although ascertained market concentration, structure and competition pattern itself do not change over time. Only behaviors and performances adjust to current conditions of income, trends and strategies for competitive efficiency.

**BIBLIOGRAPHY**


