

Supermarkets and their Impacts on the Agrifood System of Brazil: the competition among retailers

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Executive Summary

This article proposes an explanation for evidence that challenges the received knowledge in relation to the advance of the large supermarket chains in the Brazilian food market. It was thought that the large, more efficient chains would eliminate the traditional forms of retail and the smaller supermarkets as well. The evolution of the food retail structure in Brazil shows, however, growth in the number of traditional firms and independent supermarkets, in the last 9 years, with little evidence of loss of importance in food sales, especially as to the independent supermarkets whose share in food sales has grown. It was further believed that the concentration in retail would imply the power to raise prices, which would occur after the expulsion of the smaller firms. What was verified, however, were falling real prices in the food retail. At the same time, retailing price survey shows that the traditional stores survives despite higher products price and that independent supermarkets have lower average price than chain stores.

The text is divided in six sections. The first describes the food retail structure in Brazil. Following, a model of oligopoly with a competitive fringe is presented, in which the products of the nucleus and the fringe are differentiated by the convenience offered to the consumer. According to the model, the concentration in the nucleus is not sufficient to raise prices above the marginal costs. The third section analyzes the behavior of food prices in retail. Finally, some observations are made on extra-price competition. The conclusions follow.

Key Words : food retailing, supermarkets, competition, strategies, traditional stores

¹ A first version of this paper was presented at the 88th European Association of Agricultural Economists, Paris, May 2004.

Abstract

This article proposes an explanation for evidence that challenges the received knowledge in relation to the advance of large supermarket chains in the Brazilian food market. It was thought that the large, more efficient chains would eliminate the traditional stores and the smaller supermarkets as well, based on price competition. The evolution of the food retail structure in Brazil shows, however, growth in the number of traditional firms and independent supermarkets, in the last 9 years, with little evidence of loss of importance in food sales, especially as to the independent supermarkets whose share in food sales has grown.

Key Words: food retail, supermarkets, competition, price strategies, differentiation

1. Food Retail Structure in Brazil

1.1. Dimension of food retail in Brazil in 2002²

In 2002, the consumption of food in Brazil was approximately US\$ 41,9 billion, and the exportation of industrialized food reached US\$ 10,7 billion, which corresponds to 11,6% of the GNP of 2002³. Of the amount of food consumed in the country, 84% (US\$ 35,1 billion) corresponds to in-home consumption and 16% (US\$ 6,7 billion) to away-from-home meals.

Supermarkets⁴ are the main distribution channel of foods for in-home consumption (figure 1). We estimate, based on the data from AC Nielsen and ABRAS (Brazilian Supermarket Association), the percentage of food sales (for in-home consumption) at 49%⁵. The retail self-service equipment with only one checkout sold the equivalent of 9%. The traditional retail⁶ was responsible for 15%. Complementarily, away-from-home meals⁷ were responsible for 19%.

Different formats of retail stores live together in the Brazilian market, compete for consumer preference and, at the same time, complement each other.

² The amounts expressed in US dollars (US\$) are the result of the application of the average exchange rate for the year 2002 (2,9207 R\$/US\$) to the amounts originally expressed in reals (R\$).

³ In 2002 the Brazilian GNP totaled US\$ 450,8 billion.

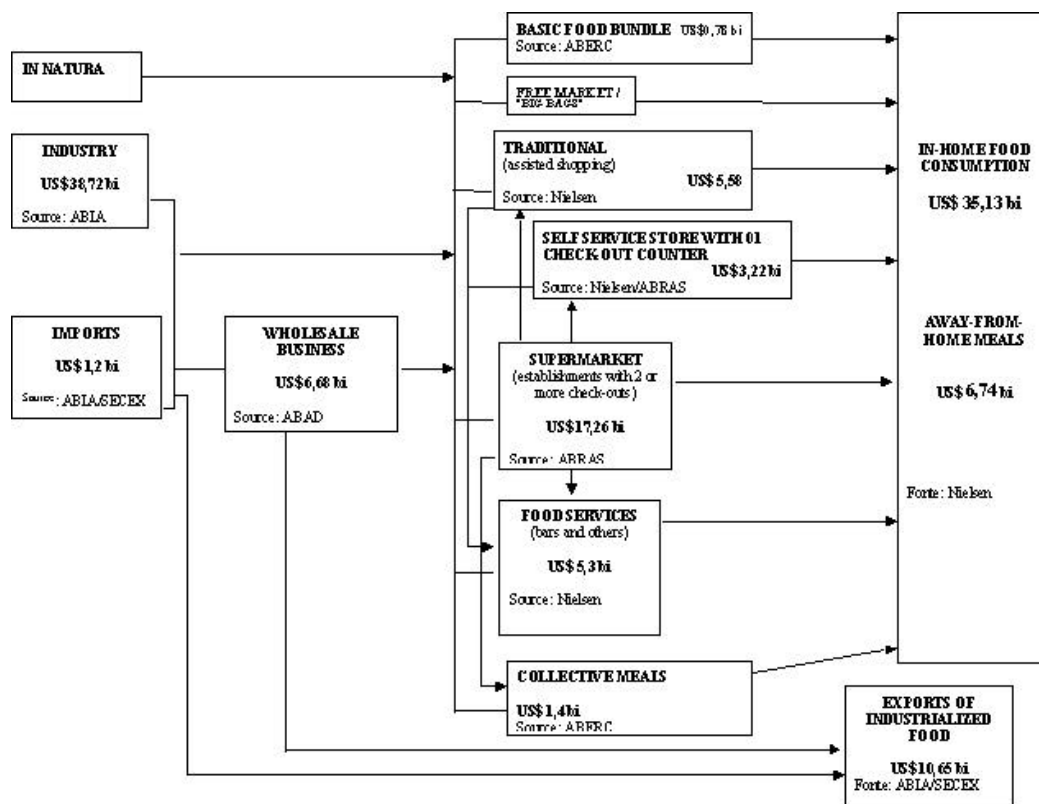
⁴ Self Service Stores, according to ACNielsen's definition, are stores that – in addition to being classified as “Food Stores” – essentially have a checkout counter, a counter at the exit, with either a cashier, or a point-of-sale terminal, or a calculator, or whatever equipment is used to add and check purchases. In addition to that, they should offer shopping baskets or strollers to customers. Most products, in such stores, are merchandised in a manner so that shoppers may serve themselves.

⁵ The ABRAS defines supermarket as a self-service store with at least 2 checkouts. Therefore ABRAS adopts a narrower definition than Nielsen.

⁶ Traditional stores, according to ACNielsen's definition, are stores where a salesperson or clerk must be present to serve shoppers.

⁷ Comprehends the food services, such as bars and restaurants, and collective meals (cafeterias and restaurants within firms)

FIGURE 1: CONSUMPTION AND DISTRIBUTION OF FOODS IN BRAZIL - 2002



Source: prepared by the authors with data from: Brazilian Food Industry Association (ABIA), www.abia.org.br; Brazilian Association of Food Wholesalers and Distributors (ABAD), www.abad.com.br; Brazilian Association of Collective Meal Firms (ABERC), www.aberc.com.br; AC Nielsen, www.acnielsen.com.br.

1.2. The received knowledge on the Brazilian food retail trends and the empirical evidence.

Deregulation, trade liberalization and monetary stabilization during the 90's increased competition through the entire Brazilian agri-food system. Idle capacity at industry level and a rapid and strong positive reaction of food consumption after stabilization led to a wave of mergers and acquisition in retail and processing segments of the food chain, and a dispute for new and old consumers of the metropolitan areas. By mid 90's, a rapid rise in the food demand was accompanied by a decline in real prices without precedents. Foreign direct investments flow reinforced the M&A wave, resulting in concentration with multinationalization.

BNDES⁸ (2000b) emphasizes the continuity of the consolidation and modernization process of the large firms of super and hypermarkets observed since the mid 1990s. The growth of the leading companies was achieved by organic investment but mainly through M&A of large and medium supermarket chains. The result was the exploration of scale and scope economies,

⁸ BNDES stands for The Brazilian National Development Bank.

increasing productivity and efficiency, not only within the stores but also in the procurement systems adopted. Because of competitive advantages of the big retail, the only alternative for medium and small businesses would be to sell their companies and leave the market.

M&A was the main strategy of Carrefour and CBD (Brazilian Company of Distribution) the two leading retailers during the 90's. Wal-Mart adopted a different strategy based on green investments. However, in 2004 Wal-Mart bought the Ahold stores, the third largest Brazilian supermarkets chain, which was leaving the country due to international problems. The main limitation of the organic growth strategy is the scarcity and high price of available areas in well-positioned points in metropolitan regions. Most of the chains, therefore, opted for acquisition of chains that were already installed, as was the case of the Portuguese groups Sonae and Jerônimo Martins.

The movement of acquisitions is not restricted to the large firms: acquisitions occur among the smaller chains, which in turn have been incorporating independent units. This movement would tend to elevate the degree of concentration in food retail, specifically in the large urban centers, such as São Paulo and Rio de Janeiro, where hypermarkets dominate the market (BNDES, 2000b).

The effects of concentration of the sector have permitted considerable increments in the operational result of supermarket chains, by means of the reduction of expenses and, mainly, the reduction of costs with the acquisition of merchandise obtained principally due to price negotiation, conditions of payment, and added services from suppliers. CBD, for example, built a mega distribution center in Greater São Paulo, to attend its different store formats, super and hypermarkets, "Extra" (hyper) "Pão de Açúcar" (super) and "Barateiro" (discount store). The cost reductions of the large chains could be transferred to the consumer provoking the elimination of less efficient formats of retail.

The advantages of size allow a supermarket chain to operate with various store formats, identified by distinct brand names or "flags", thus benefiting from the segmentation of the consumer market. Variables such as size of the stores, number of items offered, added services, and price policy can be combined, aiming to explore opportunities opened by different groups of consumers. Higher costs in areas of intense traffic or of high population density are overcome with smaller stores, supermarkets whose areas vary from 300 m² to 800 m². The format of the small store linked to a chain would be the entry door for the dispute for the consumer of a lower income level, spread out around the peripheries of the metropolitan regions. The independent supermarkets that operate in these areas would have difficulties in competing with the prices of supermarket chains.

The BNDES study is consistent with most of the available literature on food retailing, considering Brazil and other countries as well (REARDON et al (2002); GUTMAN (2002); FAIGUENBAUM et al (2002); ALVARADO (2002); CHAVEZ (2002); CLARKE et al (2002)). The consequence of rapid rise of efficient large supermarket chains would lead to concentration and market power. Downstream, consumer would face higher prices as a result of lower competition. Upstream, the suppliers would face the buyer power, lowering net prices and imposing private standards. The result would be a concentration trend among suppliers due to the preference of big retailers for larger and fewer suppliers.

The Brazilian Empirical Evidence

As expected, supermarket chains⁹ held, in 2000, 1,1% of the stores and 42,8% of the volume of food sales. With 16.6% of the stores, independent supermarkets were responsible for 44.0 % of food sales. The majority of establishments, 82,3% of them, are made up of traditional retail, which is responsible for 13,2% of the volume of sales. (Table 1)

TABLE 1 - BRAZIL – Number of stores and participation in food retail by type of retail -

Number of Stores									
Year	1994	1995	1996	1997	1998	1999	2000	2001	2002
Traditional	211.965	227.603	238.671	257.607	257.822	262.348	269.438	284.538	282.989
Chains	3.735	3.907	3.961	3.954	3.888	3.884	3.536	3.763	2.962
Independent	33.808	37.933	39.802	42.121	43.825	53.196	54.218	55.665	58.972
Total Brazil	249.508	269.443	282.435	303.673	305.534	319.428	327.192	343.965	344.922

Volume of Food Sales (%)									
Year	1994	1995	1996	1997	1998	1999	2000	2001	2002
Traditional	14,90%	15,30%	15,60%	15,40%	15,60%	13,70%	13,20%	21,00%	20,40%
Chains	45,10%	44,40%	44,60%	44,90%	46,60%	44,70%	42,80%	44,70%	43,85%
Independent	40,00%	40,30%	39,80%	39,70%	37,80%	41,60%	44,00%	34,52%	35,74%

Obs: There was a change in the methodology utilized in calculating the volume of Sales as of 2001, so that the values cannot be compared with the previous years. Until 2000, the volume of sales collected in the channels was focused on the categories audited by the various indices of ACNielsen. The new methodology considers the total volume of Sales of each channel, including all the categories that each channel sells, such as fresh vegetables and fruits.

Source: AC Nielsen Census, apud Farina & Nunes (2002)

However, the number of stores belonging to supermarket chains presented a decline of 5.3% between 1994 and 2000 (Table 2). In this period, the number of traditional retail establishments grew 27%, or 4.1% per year, while the number of independent supermarkets grew 60%, or 8.2% per year. In the same period, the GNP grew 16.4%, equivalent to 2.6% per year. It is worth mentioning that the ACNielsen Census underestimate the number of traditional stores because the Census does not include specialized fresh vegetable and fruits stores, butchery and bakeries.

Despite the increase of the degree of concentration in the segment of supermarket chains, Farina & Nunes (2002) noted a discrete trend of deconcentration in food retail at a national level. This trend is associated to the expansion of the independent supermarkets (in number of establishments and market share) and of traditional retail (only in number of establishments).

The regional reality, however, shows important distinctions. The more densely populated metropolitan regions with higher income presented greater advances of supermarket chains. Big retailers were responsible for more than 70% of food sales in the large Metropolitan Regions of

⁹ “Chain Stores” are made up of 5 or more stores under the same name and CNPJ.

São Paulo and Rio de Janeiro. In the other areas, this number was between 20% and 50%. The similar distribution in the large metropolitan areas suggests that the urban densification favors the presence of supermarket chains, whose performance would depend on large consumer markets. In Greater São Paulo, the share of chains grew 14 % between 1994 and 2000. In Greater Rio de Janeiro, the market share of chains presented a small drop of 2.22% in the same period (table 2).

In all the Nielsen areas, with exception of area II¹⁰ and Greater São Paulo, the relative weight of the chains in food sales was reduced. The reduction of the market share of chains is associated to the expansion of independent supermarkets. In the large metropolitan regions the share of this form of retail was stable, around 12% to 13% in Greater Rio and 23% to 25% in Greater São Paulo. In the other areas, the share of independent supermarkets has grown between 1998 and 2000. In the Center West (Area VII), which is undergoing a process of rapid urbanization related to the expansion of the agricultural frontier, the growth trend of independent supermarkets has been clear since 1994 (7% per year)

Traditional retail was always below 30% of food sales. The lowest share is in Greater São Paulo, which registered a relative fall, from 7,7% in 1994 to 5,5% of the food sales in 2000. In areas V (São Paulo countryside) and VI (South region) a drop was observed in the share of traditional retail between 1998 and 2000 in the volume of food sales. This trend, however, was not verified in the other areas, where traditional retail presents a modest, but positive, growth.

All the Nielsen areas presented an increase in the number of traditional retail stores. The annual growth rates varied between 0,8% per year, in the South region (area VI) and 5,6% per year in the Center West. In the South we see the highest growth rate of independent supermarkets, 16% per year, between 1994 and 2000. This coincidence suggests that, at least in the South region, part of traditional retail may have been transformed into independent supermarkets, adapting their equipment to self-service¹¹.

The number of independent supermarkets fell in the two largest metropolitan regions, Greater São Paulo and Greater Rio, where falls of 3.74% and 4.1% per year were registered between 1994 and 2000. In the other areas, the growth of the independent supermarkets was vigorous, with annual rates between 4.7% (area II) and 16% (area VI). In Greater Rio, the reduction of the number of independent supermarkets was not accompanied by an important reduction in the fraction of this type of establishment in the volume of food sales, which suggests that there was an increase in the average size of the independent supermarket store, perhaps due to the exit of smaller units. The share of supermarket chains did not grow, despite the reduction of the number of independent stores. Only in Greater São Paulo (area IV) was an increase in concentration verified in food retail, with the market share of supermarket chains growing inasmuch as the number of independent supermarkets fell.

¹⁰ This area includes the states of Minas Gerais, Espírito Santo and Rio de Janeiro (excluding the cities of Rio de Janeiro, Niterói, Nova Iguaçú, Duque de Caxias, Nilópolis, São Gonçalo and São João de Meriti).

¹¹ The Nielsen Census overestimates the number of supermarkets, when compared to ABRAS, since they only require one checkout for the store to be considered an independent supermarket.

AC Nielsen Regions	Variation of the number of stores(1994-2002)-%		Variation in food sales (1994-2000)-%		Variation in total sales(2000-2001)%	
	Total	Average rate of annual growth	Total	Average rate of annual growth		
Region I	Traditional	47,33	5	4,39	0,78	-0,017
	Chains	-40,48	-4,57	-17,6	-2,87	-0,011
	Independent	106,38	10,01	20,39	3,64	0,024
Region II	Traditional	32,65	3,79	-2,2	0,047	-0,022
	Chains	8,22	1,5	8,22	1,51	-0,075
	Independent	43,57	4,71	-2,64	-0,34	0,038
Region III	Traditional	55,57	5,83	12,6	2,05	0,343
	Chains	58,52	6,5	-2,22	-0,35	-0,05
	Independent	-53,02	-4,16	1,72	0,7	-0,166
Region IV	Traditional	31,02	3,58	-28,57	-5,27	-0,06
	Chains	15,86	2,07	14,01	2,26	0,028
	Independent	-35,94	-3,74	-22,37	-3,84	-0,044
Region V	Traditional	31,52	3,58	-23,12	-3,93	-0,086
	Chains	-21,07	-2,27	-14,07	-2,39	0,031
	Independent	58,46	6,14	15,6	2,55	0,014
	Traditional	6,23	0,87	-25,51	-4,1	0,04

Region VI	Chains	-15,73	-0,95	-13,72	-2,3	-0,08
	Independent	188,8	15,82	22,58	3,52	0,05
Region VII	Traditional	52,97	5,68	4,02	0,68	0,041
	Chains	0	1,18	-27,53	-5	-0,08
	Independent	65,21	7,07	15,88	2,5	0,032
BRAZIL	Traditional	33,5	3,72	-11,41	-1,86	-2,86
	Chains	-20,69	-2,47	-5,1	-0,83	-1,9
	Independent	7,44	7,36	10	1,72	3,53

Source: Prepared by authors based on the ACNielsen Retail Censuses (1994-2002)

2. The survival of small retail

The empirical evidence does not support the theory of the disappearance of small retail caused by the expansion of the supposedly more efficient large supermarket chains. This section presents an explanation for the survival of small retail, based on the fact that large supermarkets and small retail offer their clients different combinations of prices and convenience, or purchasing costs.

The consumer has available two perfect substitute goods, one of them sold exclusively at the stores of the dominant nucleus and the other good available only at the stores of the competitive fringe. To buy in each type of store, the Nucleus or the Fringe, the consumer incurs different purchasing costs, t_D and t_F , which involve transport costs, distances moved inside the store, time lost in choosing the products and in the checkout line, etc. We stipulate, for simplicity's sake, that the purchasing costs in each type of retail store are, for each consumer, fixed, in the sense of not depending on the quantity purchased. The purchasing costs differ among consumers, whether for the different distances between the residence and the stores, or the differences in preferences. The i -th consumer faces the problem of maximization of the following utility function, subject to the budget constrain:

$$U_i = \begin{cases} q_D^i - \tau_D^i, & \text{if purchase is in } D \text{ (Dominant Nucleus)} \\ q_F^i - \tau_F^i, & \text{if purchase is in } F \text{ (Competitive Fringe)} \end{cases}$$

$$p_D q_D^i + p_F q_F^i = w^i$$

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where q_D^i (q_F^i) is the quantity purchased in the store of the dominant nucleus (fringe) and τ_D^i (τ_F^i) is the respective purchasing cost for the i -th consumer; w^i is his income or wealth.

The consumer will be indifferent to shopping in stores of the dominant nucleus or of the fringe if the net utilities in the two channels are equal or if the difference in the quantity that can be purchased in the two channels compensates exactly the additional disutility corresponding to the difference in the purchasing costs

$$U_i(q_D^i - \tau_D^i) = U_i(q_F^i - \tau_F^i)$$

$$U_i\left(\frac{w^i}{p_D} - \frac{w^i}{p_F}\right) = -U_i(\tau_D^i - \tau_F^i)$$

The purchasing costs in the establishments of the dominant nucleus are, by assumption, higher. In general, the stores of the large supermarket chains are less numerous and less spread out than those of the competitive fringe. Furthermore, as the stores of the dominant nucleus are larger, it is necessary to move greater distances within the store, which implies more time spent shopping. There are also long checkout lines at peak times. t includes attributes of transaction other than the food product itself. It is assumed that transactions entail multi dimensions and that different retail stores formats offer different transaction attributes.

From the condition of indifference, a relationship is established between the prices of supermarkets and of traditional retail. This relationship is restricted by the purchasing costs in the two distribution channels. If the relationship between the prices that makes the consumer indifferent to the type of store is not respected, the consumer will buy exclusively in the channel that will provide greater net surplus. If the relationship is respected, the choice of the consumer remains undetermined. We stipulate, in this case, that the expected quantity of purchase is 0,5 w/p , because the consumer will choose the supermarket and the traditional retail with 50% of probability each. The demands of the dominant nucleus and the fringe are:

$$q_D^i = \begin{cases} q_D^i = \frac{w^i}{p_D}, & \text{if } U\left(\frac{w^i}{p_D} - \frac{w^i}{p_F}\right) > -U(\tau_D^i - \tau_F^i) \\ q_D^i = 0, & \text{if } U\left(\frac{w^i}{p_D} - \frac{w^i}{p_F}\right) < -U(\tau_D^i - \tau_F^i) \\ q_D^i = \frac{w^i}{2p_t}, & \text{if } U\left(\frac{w^i}{p_D} - \frac{w^i}{p_F}\right) = -U(\tau_D^i - \tau_F^i) \end{cases}$$

$$q_F^i = \begin{cases} \frac{w^i}{p_F} & , \text{ if } U\left(\frac{w^i}{p_D} - \frac{w^i}{p_F}\right) < -U(\tau_D^i - \tau_F^i) \\ q_F^i = 0 & , \text{ if } U\left(\frac{w^i}{p_D} - \frac{w^i}{p_F}\right) > -U(\tau_D^i - \tau_F^i) \\ \frac{w^i}{2p_i} & , \text{ if } U\left(\frac{w^i}{p_D} - \frac{w^i}{p_F}\right) = -U(\tau_D^i - \tau_F^i) \end{cases}$$

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At the market, there are n consumers with different purchasing costs and incomes. The aggregation of the individual demands generates two demand functions, of supermarkets and of traditional retail. These demands are continuous, decreasing in prices themselves and increasing in relation to the prices of the other channel.

$$Q_D = \sum_{i=1}^n q_D^i(p_D, p_F, w^i) \quad ; \quad \frac{\partial Q_D}{\partial p_D} < 0 \quad ; \quad \frac{\partial Q_D}{\partial p_F} > 0$$

$$Q_F = \sum_{i=1}^n q_F^i(p_D, p_F, w^i) \quad ; \quad \frac{\partial Q_F}{\partial p_F} < 0 \quad ; \quad \frac{\partial Q_F}{\partial p_D} > 0$$

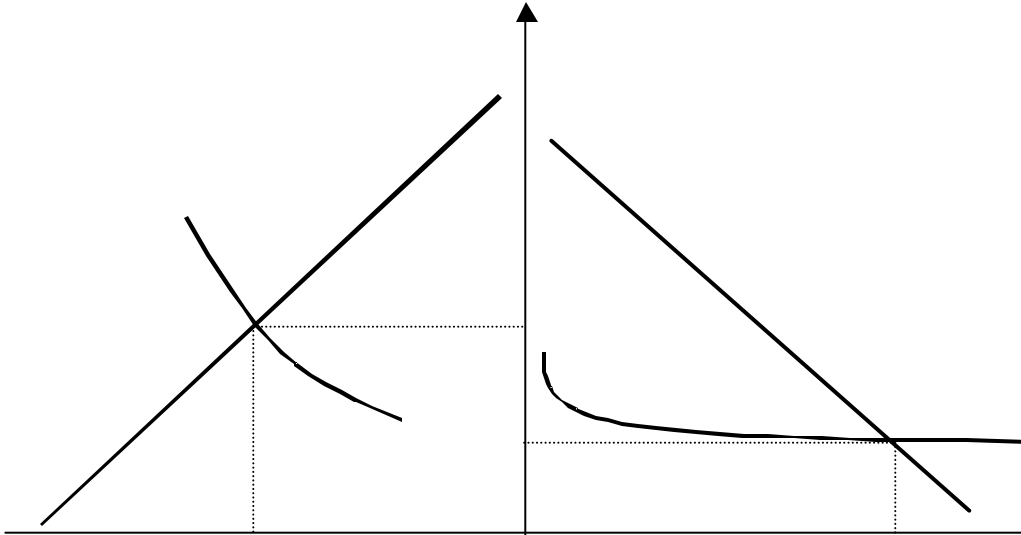
The food retail structure is described as an oligopoly with a competitive fringe. The firms of the dominant nucleus (large supermarket chains) compete via prices, according to the Bertrand Model. We stipulate that the supermarket chains differentiate little among themselves; for the effect of analysis, the vast differentiation occurs between the supermarket chains and traditional retail and independent supermarkets situated on the competitive fringe. For each firm of the dominant nucleus, the demand is highly (infinitely) elastic to prices.

Following the example of the Favaro and Spiller model (1984) each supermarket chain, by changing its decision as to prices hopes that the reaction of other chains will be retaliation and of the fringe will be to settle into a model of dominant firm.

Given a minimum volume of sales, the marginal costs of the supermarkets located in the dominant nucleus are constant. The competitive fringe (traditional retail and independent supermarkets) has higher marginal costs than those of the dominant nucleus and they are, furthermore, increasing.

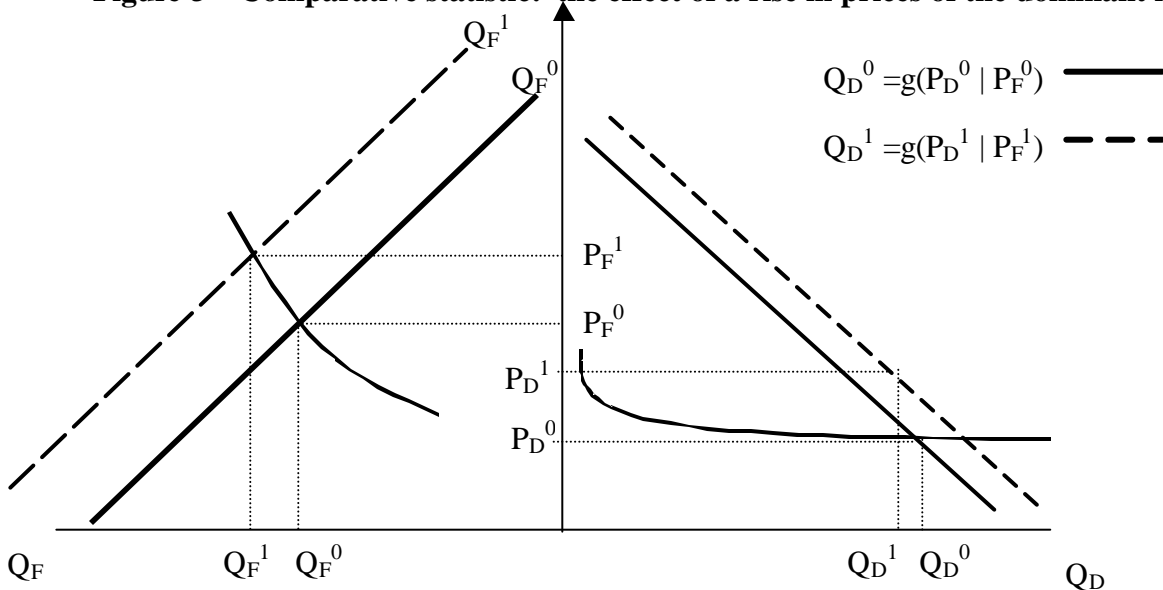
The competition in the dominant nucleus has as a direct result the determination of prices equal to the marginal cost (constant) of this segment (right side of Figure 2, $p_D^* = MC_D$). With price p_D defined, a curve of demand is determined for the competitive fringe (on the left side of Figure 2, in mirrored image, $Q_F = f(p_F|p_D)$). The firms of the competitive fringe are price takers. The curve of marginal cost of the fringe (MC_F) is the aggregate supply of this segment of retail. The intersection of the demand (Q_F) and supply (MC_F) curves define the price (p_F^*) and the quantity (Q_F^*) of equilibrium of the fringe. With the fringe price defined, a demand curve is determined for the dominant nucleus ($Q_D = g(p_D|p_F)$). On this aggregate demand curve of the dominant nucleus is defined, to price p_D^* , the quantity demanded of the dominant nucleus (Q_D^*).

Figure 2 – Market Equilibrium in the dominant nucleus (right) and the competitive fringe (left)



It is important to observe that the demands of the nucleus and the fringe are not independent. Figure 3 illustrates the effect of a rise in prices of the dominant nucleus. Suppose that the supermarket chains decide to coordinate their price policies, fixing prices above the marginal costs (MC_D). The prices of the nucleus would go from p_D^0 to p_D^1 ; $p_D^1 > p_D^0$. In response to the rise in prices, some consumers migrate to the fringe. The demand curve of the fringe moves up and to the left (in the mirrored part of Figure #1, the broken line), determining a new equilibrium in the fringe (p_F^1, Q_F^1), with greater prices and quantities. The demand curve of the nucleus moves up and to the right, in a position consistent with the new price of the fringe (p_F^1). The new demand curve of the nucleus is represented by the broken line in the right part of the graph. The dominant nucleus loses market share ($Q_D^1 < Q_D^0$), but less than in the hypothesis of the fringe not responding to the increase in nucleus price. The loss of market will be greater the more elastic the supply curve of the fringe.

Figure 3 – Comparative statistic: the effect of a rise in prices of the dominant nucleus



Supposing that the original situation (variables indexed with 0) were of long-term equilibrium, the increase in prices on the fringe (induced by the increase of prices in the nucleus) would begin to provide economic profit on the fringe and to attract the entry of new firms. With the movement of the supply curve, the prices of the fringe would fall and the demand curve of the nucleus would move down and to the left. In the long term, the loss of market share of the dominant nucleus would be more intense, ending with a quantity lower than Q_D^1 .

Despite the concentration of food retail, the firms of the dominant nucleus have difficulty raising prices and extracting a higher surplus from the consumer. In the short term, competition between firms of the nucleus, which occurs primarily via prices, causes the strategy to sustain high prices to be dominated by the strategy to lower prices, since the demands of the individual firms are highly elastic to prices. In the long term, the growth of the competitive fringe puts in check the attempt of nucleus firms to coordinate their price policies (a result that could emerge from the repetition of the Bertrand model).

Small food retail survives despite having higher costs than the large supermarket chains because it offers more convenience to the consumer, or, in the terms of the model presented, involves purchasing costs to the consumer that are lower than the large chains. There is a tradeoff between prices (lower in the supermarkets and the hypermarkets) and purchasing costs (lower in the traditional retail and independent supermarkets). As the consumers have distinct preferences in relation to price and convenience- and a single consumer can even, in different circumstances, choose different distribution channels-, there is space in the market for traditional retail and for independent self-service stores.

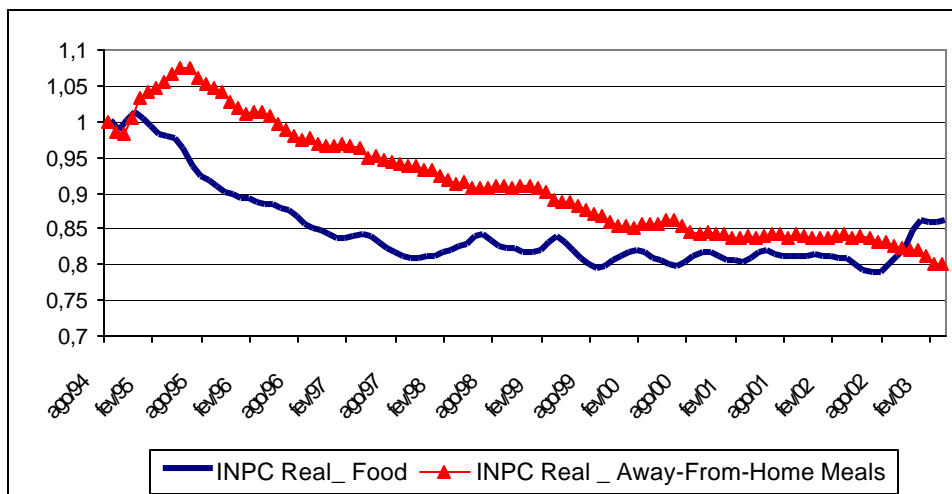
As the alternative of raising prices results in loss of market for the dominant nucleus or for the competitive fringe, the large supermarket chains seek cost-reducing innovations, whether in the process of controlling merchandise flows, or in the negotiations with suppliers. As long as the other firms of the nucleus do not copy the innovation, the pioneers can realize economic profit or reduce the prices to the consumer, winning parcels of the market from their direct competitors.

3. Consequences on the prices to the consumer

3.1. Evolution of the degree of concentration and behavior of prices

Consistent with the predictions of the model, food real prices were drastically reduced, precisely in the period of greatest demand 94-97. The data from INPC/IBGE show reductions of 20% on average for Brazil. Away-from-home meals, in turn, present a slow reduction in real prices, though over a longer period of time, reaching 2001 with real price indices 15% lower than in 1994. That is, both in retail and in food services, food prices present drops in relative prices.

GRAPH 1 – Food Real Price Index – Brazil (National Consumer Price Index – INPC Brazil, deflated by the general INPC)



Source: Basic data from IBGE (www.ibge.gov.br)

The groups that led the rise in prices – education, health, and housing – present a large share of services in their composition and, in the case of housing, tariffs controlled by the public sector (water, sewage, gas, telephone, and electric power). The groups that most contribute to the maintenance of low inflation rates comprehend products in which inputs have greater weight in the cost composition, with lower participation of labor (in comparison with, for example, the groups of education and health). Furthermore, these are products more directly exposed to international competition, since the trade liberalization begun at the end of the 80s.

The behavior of food prices in the nine metropolitan regions in which prices are gathered for the calculation of the INPC – National Consumer Price Index - (Belém, Belo Horizonte, Cuiabá, Curitiba, Fortaleza, Porto Alegre, Recife, Salvador, and São Paulo) was very similar, despite the different retail structures identified in these regions.

A possible interpretation of this fact is that the macroeconomic factors that influenced food prices, such as exchange rate, interest rate, and federal taxes, were more important than the idiosyncratic factors of the metropolitan regions. Thus, for example, shocks such as the exchange devaluations of 1999 and 2001 impacted the costs of the food industry in a similar manner, but not necessarily equal, in all the Brazilian regions.

Changes in the degree of concentration in food retail, on the other hand, were not significant to explain the variations in the food prices to the consumer. With the objective of testing the hypothesis that the different structures do not explain the price difference among the regions, ALMEIDA (2003) utilized the Spearman correlation coefficient (r_s)¹² between variations of the prices and the degree of concentration. For this, two variables were created for each region representing the variation of the IPCA (VIPCA) and the participation of supermarket chains in food retail (VCONC). Both represent the annual variation of a given region in relation to the average observed in Brazil in each year. That is,

¹² One of the techniques of inference that does not require very strong hypotheses on the parameters, denominated “non-parametric”: the Spearman correlation coefficient depends only on the ordering of the objects according to the variables whose correlation one wishes to gauge (Siegel, 1981).

$$VIPCA_{j,t} = (IPCA_j t / IPCA_j t-1) / (IPCA \text{ Brazil } t / IPCA \text{ Brazil } t-1)$$

$$VCONC_{j,t} = (\text{Concentração } j t / \text{Concentração } j t-1) / (\text{Concentração Brasil } t / \text{Concentração Brasil } t-1)$$

The subscripts in the expressions above represent, in the order that they appear, the region and the date (year) of the observation. The procedure to relate the value of the variables observed in each region to the national average has the objective of isolating the effects of factors common to the variations of food prices in all the regions studied. The results are reproduced in Table 2.

TABLE 2 – Variation of the IPCA-food and the concentration in the food market (in %) and Spearman Correlation Coefficient r_s

	I – NE		II – RJ		III – Gde RJ		IV – Gde SP		VI – Sul	
	VIPCA	VCONC	VIPCA	VCONC	VIPCA	VCONC	VIPCA	VCONC	VIPCA	VCONC
95/94	1,05	0,99	0,97	1	0,98	0,99	0,99	1,1	1,04	0,94
96/95	0,99	0,98	1,02	0,98	1	0,99	1	1,01	0,98	0,97
97/96	0,98	1,03	1	1,08	1,03	0,99	1,01	0,98	1,02	1
98/97	5,88	1,03	1,07	0,99	3,49	0,96	2,81	1	1,92	0,99
99/98	1	0,88	1	1,14	1	1,02	1	1,02	1,05	1,08
00/99	0,98	0,96	1	0,96	0,98	1,08	1	1,08	0,98	0,94
r_s	0,54		-0,6		-0,37		-0,71		0,43	

Critical values: 0,94 e 0,82, for significance of 1% and 5%, respectively. (SIEGEL, 1979)

Source: ALMEIDA (2003), based on ACNielsen Retail Censuses and IBGE.

ALMEIDA (2003) rejected in all the regions the hypothesis that the increase of degree of concentration in food retail is correlated to the increase of food prices to the consumer. According to the author, “it cannot be affirmed that the different evolutions of IPCA verified in each metropolitan region can be explained by the different market structures”.

3.2. Food prices in supermarkets and in traditional retail¹³

A hypothesis to explain the coexistence of different retail stores was raised in BNDES (2000c): ‘One factor of great importance resides in the policy and effective practice of lower prices, on the part of smaller firms, since one of the main reasons for consumers to shop in hypermarkets is the price. Insofar as the neighborhood stores function with lower prices, there is a transfer of purchases from hypermarkets to these supermarkets.’

This argument contains some difficulties: if the chains have cost advantages, for example, coming from economies of scale, they could practice lower prices than the independent supermarkets, gaining market share and increasing their profits. The diversity of forms in retail could be understood if the purchasing costs to the consumer were taken into account. In the large supermarkets, the prices are lower, but the purchasing costs (going to the store, checkout line,

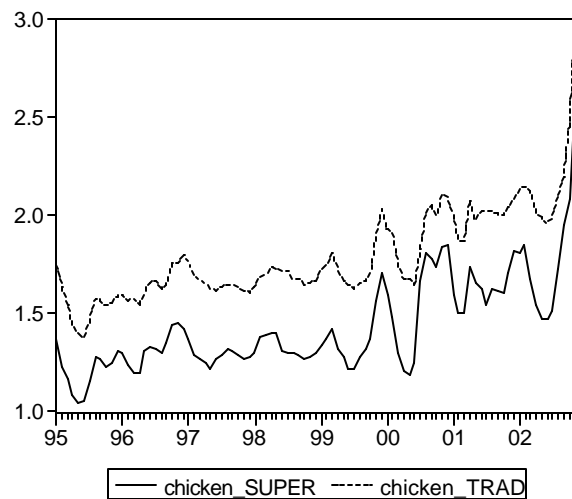
¹³ This item is based on the development of the scientific initiation of Guilherme Fowler de Ávila Monteiro.

movement within the store) are high; in small retail, the opposite occurs (higher prices, lower purchasing costs). If there is space for the two retail formats, it is because the advantages (pecuniary and non-pecuniary) of each format compensate each other in some way. Otherwise, the optimal retail form would dominate the entire market.

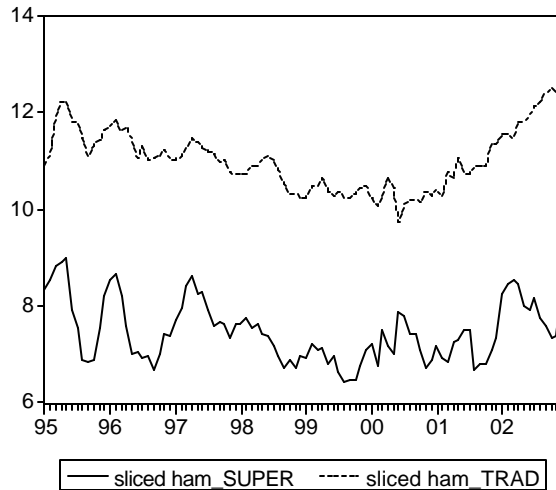
BNDES (2000c) went as far as to raise the hypothesis that small retail would practice lower prices as a means of surviving the competition of hypermarket and supermarket chains. The evidence obtained for the metropolitan region of São Paulo in the data bank of IPC-Fipe suggests that this hypothesis is incorrect for an important set of products. It could be said in fact that the general rule is lower prices in supermarkets.

To evaluate the prices practiced in different retail stores, MONTEIRO (2004) utilized the data bank of IPC-Fipe (Consumer Price Index, prepared by the Institute of Economic Research Foundation). This price index refers only to the Metropolitan Region of São Paulo. Historic series of prices were selected from 12 products: whole chicken (graph 2), *rump steak* (graph 4), *acém* (beef cut), sliced ham (graph 3), *prato* cheese, fresh rolls, special milk, long life milk (UHT), tomato, carrots, shark, and fresh sardines.

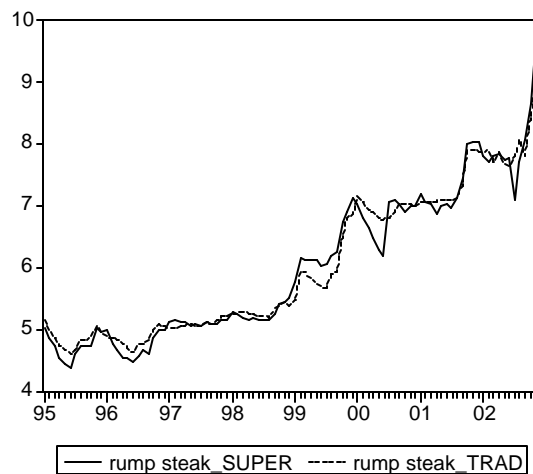
GRAPH 2 – PRICES OF WHOLE CHICKEN IN SUPERMARKETS AND IN TRADITIONAL RETAIL-CURRENT R\$/KG



GRAPH 3 – PRICES OF SLICED HAM IN SUPERMARKETS AND IN TRADITIONAL RETAIL-CURRENT R\$/KG



GRAPH 4 – PRICES OF RUMP STEAK IN SUPERMARKETS AND IN TRADITIONAL RETAIL – CURRENT R\$/KG

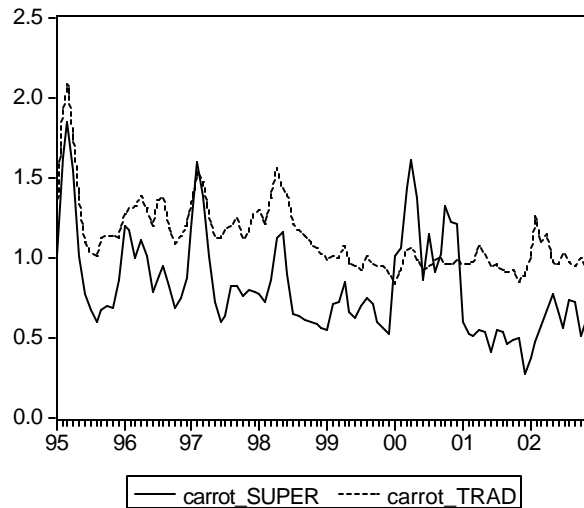


The price information collected does not support the hypothesis that the supermarkets manage higher prices than traditional retails. Among the products studied, not a single case was found in which supermarkets practiced higher prices than traditional retail. The products that systematically revealed lower prices in the supermarkets were whole chicken (graph 2), sliced ham (graph 3), *prato* cheese, fresh rolls, and long-life milk.

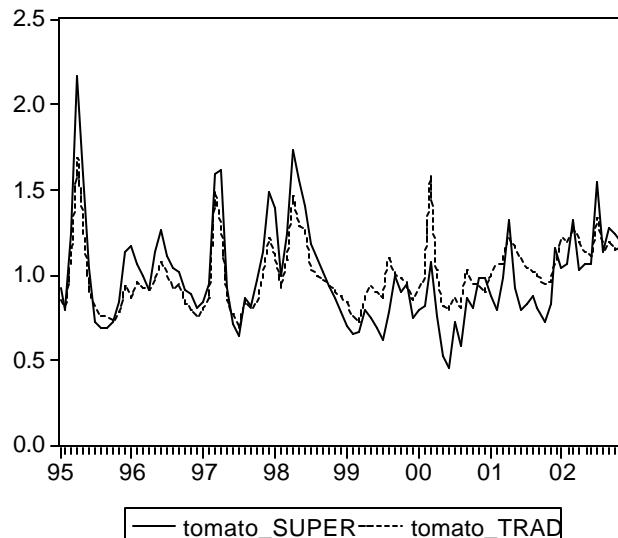
If the consumer is willing to pay a premium for shopping at the more convenient retail store, the temporal price series of a single product in the supermarkets and traditional retail must cointegrate. The difference among prices should express consumer preferences in relation to convenience. MONTEIRO (2004) performed cointegration tests among the price series of traditional retail and supermarkets. In the tests, the null hypothesis of nonexistence of cointegration was rejected for meats (*acém*, *rump* and chicken), fresh rolls, ham, and cheese. The cointegration vectors estimated corroborate the hypothesis that the prices of chicken, fresh rolls,

ham and cheese are lower in supermarkets, while the prices of beef did not show a significant difference. In relation to tomato and carrots the stable pattern of the price series made it impossible to apply the analysis of cointegration. However, the supermarkets present lower prices than traditional retail for these products (graphs 03 and 04).

GRAPH 5 – PRICES OF CARROT IN SUPERMARKETS AND IN TRADITIONAL RETAIL – CURRENT R\$ / KG



GRAPH 6 – PRICES OF TOMATO IN SUPERMARKETS AND IN TRADITIONAL RETAIL – CURRENT R\$ / KG



The result obtained from the cointegration tests indicates a positive and stable difference between the machines. The higher prices of the fringe are, therefore, ratified by the consumers, according to the model presented above. The differential responds to two principal motives: higher marginal costs of the fringe and economic profits resulting from the price strategy of the

nucleus of dominant retail firms. The lower the price of the nucleus and greater the difference of costs, the lower the market share of the fringe.

The differences of marginal cost, however, have been lessened by the suppliers (food industries and wholesalers) who seek to reduce the share of the large chains in the distribution of their products and thus lower their bargaining power. It is important for these suppliers to preserve, and hopefully make grow, the competitive fringe. FARINA and NUNES (2002) found evidence of this behavior. The food industries manage higher margins in sales to small retail, but the distribution costs are higher. Some industries have made specific investments to reduce the costs on sales to traditional retail, even in more capital-intensive segments, such as products whose distribution depends on a cold chain.

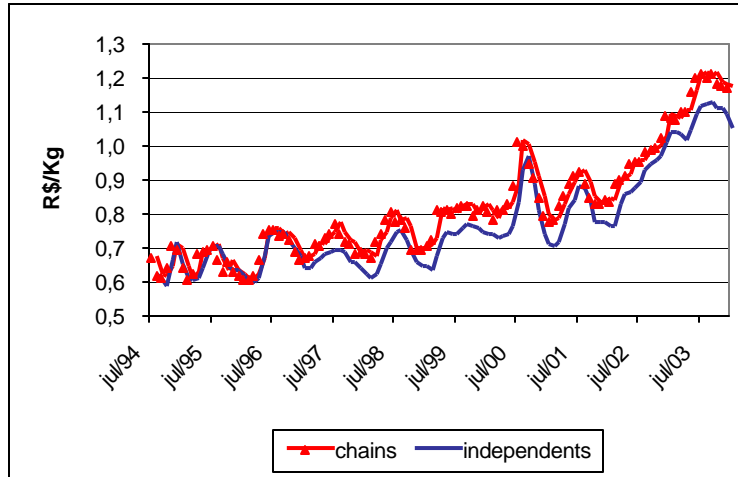
The functions of wholesale can be vertically integrated by the supermarket chains, presenting a threat to this segment of the agrifood system. For some food industries, a large portfolio of small clients has the power to counterbalance the force of the large chains. In this sense, wholesalers and industries follow the prices of the large supermarket chains and adopt, for traditional retail, policies of price discounts that allow them to remain in the market. The support of the industries and wholesalers to firms on the competitive fringe also includes services of technical assistance in relation to stock management, adaptation of the mix of productions, store layout, and financial management.

4. Independent Supermarkets and Big Chains

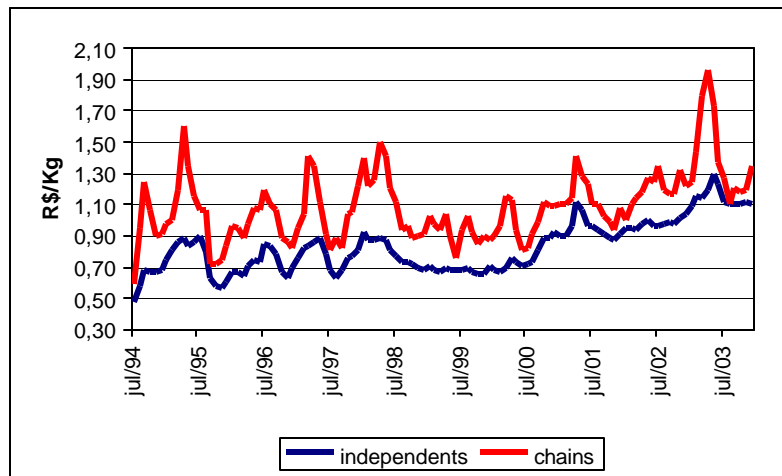
The success of the strategies of wholesalers and food processors is confirmed by another important variable: prices! Despite the general believe that they are less efficient than big chains, due to size economies, the average price of food at independent supermarket has been lower than the average price of chain stores. The evidence also confirms a previous research developed in Minas Gerais (Southwestern Region) for a basket of food staples (BORGES,2003).

Graphs 7 to 12 show that independent supermarkets offer prices equal or lower than chain stores for the São Paulo Metropolitan Area. Four baskets of products are analyzed: daily products (bread, UHT milk, sliced cheese, sliced ham and butter), perishables (fruits and vegetables), industrialized (margarine, chocolate beverages, sweetener and powder milk) and staples (rice, beans, salt, oil, sugar and coffee). It is worth noting that for industrialized standard food products the prices are quite similar. The differences are higher for perishables products and for daily products that require some assistantship. Other reasons for this behavior must be identified by further research, already in progress.

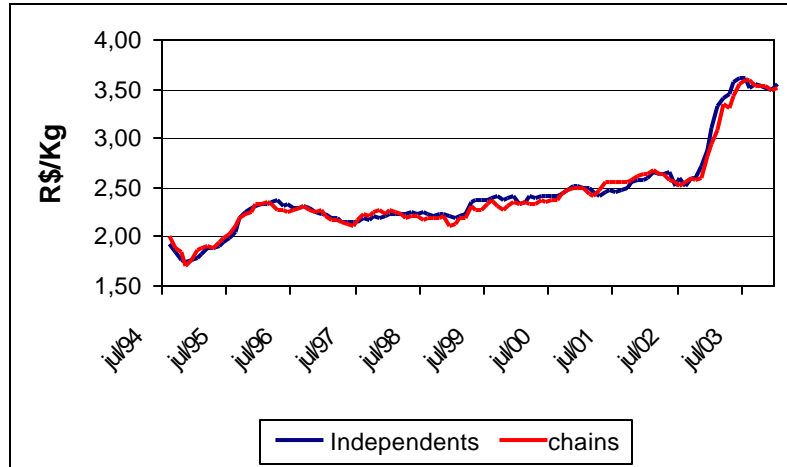
GRAPH 7 – PRICES OF DAILY PRODUCTS IN PERISHABLES IN INDEPENDENT SUPERMARKETS AND CHAIN STORES - CURRENT R\$ /KG



GRAPH 8 – PRICES OF PERISHABLES IN INDEPENDENT SUPERMARKETS AND CHAIN STORES - CURRENT R\$ /KG

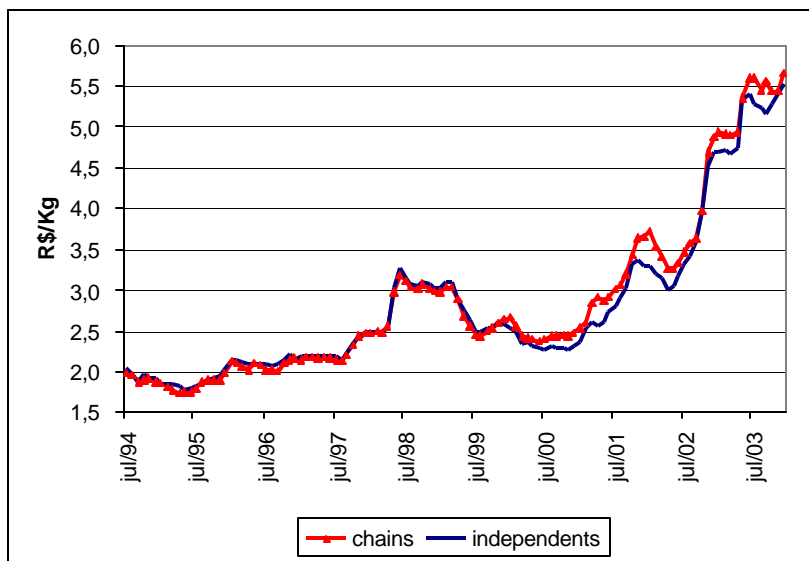


GRAPH 9 – PRICES OF INDUSTRIALIZED IN INDEPENDENT SUPERMARKETS AND CHAIN STORES R\$ /KG



GRAPH 10 – PRICES OF STAPLES IN INDEPENDENT SUPERMARKETS AND CHAIN STORES

R\$ /KG



5. Extra-price competition

The large supermarket chains make investments in marketing to differentiate themselves from the competitors of the dominant nucleus. The brand names or “flags” of the chains are necessary tools for the differentiation and have been the target of agencies for the defense of competition, in cases of mergers and acquisitions. In relation to competition with the fringe, the large chains make investments to reduce purchasing costs and offer services similar to those of traditional retail and of independent supermarkets. Services of home delivery and store credit cards aim to attract low-income clients, who have no car or access to commercial banks. For the

high-income public, some chains offer services of purchases via Internet. The chains invest also in the adaptation of the format of the stores to the profile of the consumers. At the beginning, the large chains set themselves up with large stores that offered tens of thousands of items, food and non-food. Following, they developed smaller formats, with fewer offers of items focused on food and hygiene and cleaning products, so as to reproduce some of the characteristics of the traditional neighborhood retailer.

To face the competition with supermarket chains, the smaller firms adopted strategies to compensate the advantages associated to the size (of the firm, not the store) of their new competitors. One trend detected by BNDES (2000c) was associativism. Among the services provided by the supermarket associations are joint purchases, which increase the purchasing power with suppliers and make negotiations easier. Some associations emerged initially with the purpose of centralizing purchases, but evolved to the provision of a broad range of collective goods, such as: fidelity card, credit card, marketing campaigns, legal and accounting aid, brand name, automatization, training of employees, and even the centralization of selection and administration of human resources. The standardization, which includes the layout of the stores, employee uniform, bags, packages, prices lists, posters, and promotions is also a cost-reducing advantage brought by associativism. There are associations that are integrated with a logistical operator, so that the stores can diminish the storage spaces and reduce the costs of supply (hours and large number of deliveries).

Associativism, however, does not include most of traditional retail and independent supermarkets. There are significant costs (not always monetary) in the installation and operation of the associations, with the need to integrate different entrepreneurial cultures and to preserve the interests of all the participants.

6. Conclusions

Brazilian urban consumers were the beneficiaries of food retailing restructure occurred during the 90's. Food prices slumped since the stabilization plan of 1994. Although the received knowledge predicted the disappearance of medium and small retail, the Brazilian empirical evidence does not confirm this prediction. On the contrary, the number of independent supermarkets and traditional retailers has grown, and their share in food sales has increased, except for the Metropolitan Area of Sao Paulo.

A model base on the Hotelling assumptions and on Favaro and Spiller model was proposed to explain the traditional retail survival. The model predictions are consistent with the Brazilian facts during the last decade. Traditional retail lives together with the modern big retail, despite setting higher prices. Consumers are willing to pay more for the convenience offered by small retail – lower transport costs, no lines, etc. Despite the high concentration in the dominant nucleus, there is a strong competition among the few and big, enough to transfer the gains in productivity and costs to consumers. No correlation was observed between the degree of concentration in retail and price behavior. The prices practiced by supermarkets were, for a small group of products in which it was possible to make the comparison, lower than those of traditional retail. Independent supermarkets have grown in number of stores and food sales market share. Their performance is far better than the traditional stores and this may be explained

by their price policy. Independent supermarkets have offered lower prices than the chain stores, in different formats.

The results counter the view according to which small food retail had its days numbered or would survive thanks to the underpayment of the factors employed and stress the importance of ask what has happened to small and medium retailers. Most of papers and researches on recent rise of supermarkets bring information on the leaders but say nothing about the fringe that is extremely important to understand the dynamics of food distribution in urban areas.

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