

Food retailing competition and Trust: some evidences from Brazil ¹

Guilherme F. de A. Monteiro²

Elizabeth M. M. Q. Farina ³

Abstract

The empirical evidence in Brazil does not support the theory of disappearance of small retailing in response to the expansion of chain supermarkets. The paper explores the interaction between consumer behavior and competition among different retailing formats. The research focuses on the survival of independent supermarkets. A model is proposed and then expanded through the examination of trust as a competitive force. The empirical evidence for *acém* (meat) suggests that the independent supermarkets set lower prices in response to the expansion of chain supermarkets. The analysis brings to light the *heterogeneity of the competitive fringe* in the oligopoly model of Brazilian retailing.

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

1. Introduction

A recent literature on supermarkets has emphasized three complementary arguments: (i) the retail fast concentration; (ii) the increasing buying power of supermarket chains and (iii) the adoption of private standards. ⁴ These arguments are linear: the rise of supermarkets increases its buying power and allows it to impose prices and standards on the supply chain. Private standards, which are complex and represent additional costs, lead to the exclusion of small business (processors and farmers). Moreover, since small retailers are expected to present higher prices, one anticipates the disappearance of traditional

¹ Paper prepared to be presented at the *2007 IAMA World Forum & Symposium, Parma, Italy – june/2007*.

² Graduate student (University of Sao Paulo); former research assistant, the Food and Agribusiness Program (PENSA) at the University of Sao Paulo. The author thanks the financial support of FAPESP.

³ President of the Brazilian Council for Economic Defense (Cade) since July 2004. From 2002 to 2004 she was the Head of the Economics Department (University of Sao Paulo) and Vice-Coordinator of the Food and Agribusiness Program (PENSA) at the same university. The ideas and opinions presented on this paper are personal and do not reflect any CADE's or official opinions/position.

⁴ Reardon, T. et al (2002); Gutman, G. (2002); Faiguenbaum, S. et al (2002); Alvarado (2002) e Clarke R. et al, (2002).

retailing (bakery, butcher shop and fair-free) and the acquisition of independent supermarkets.

Although this linear relationship is widely considered in literature, recent studies reject this hypothesis.⁵ The retailing concentration in Brazil occurs through the acquisition of relatively smaller supermarkets chains by bigger chains, together with the increase of independent supermarkets and the non significant reduction of traditional retailers. The national market can be characterized as an oligopoly with competitive fringe. The nucleus encompasses the big chains and the fringe is represented by the traditional retailing and the independent supermarkets.

While the survival of traditional retailing has already been object of analysis⁶, the continued existence of independent supermarkets has to be better investigated. This article explores the interaction between consumer behavior and competition among different retailing formats in Brazil. The research focuses on the survival of independent supermarkets and its apparently controversial price policy.

Section 2 presents a general framework for the analysis of the retailing sector; we address the issue of multi-dimension analysis. Section 3 investigates the survival and the pricing mechanisms of independent supermarkets. Section 4 expands the analysis through the examination of trust as a competitive force. Section 5 presents empirical evidences. The conclusions are presented in the last section.

2. An integrated analysis of the food retail⁷

Retail stores can be divided into four categories: hypermarkets, chain supermarkets, independent supermarkets and traditional retail.

Although there is a substantial degree of differentiation within the groups, one may ponder that differences among groups are more important. The table below presents some basic attributes that characterize transactions between retailer and consumers. There are three intensity levels (high, average and low) for each attribute in each retailer category.

⁵ Farina, Nunes and Monteiro (2005a), Monteiro (2005)

⁶ Ibid note 2

⁷ Based on Farina, Nunes and Monteiro (2005b)

Table 1: Attributes of transactions with final consumers in food retail⁸

	Hypermarket	Supermarket chain	Independent supermarket.	Traditional retail
Capillarity	Low	Medium - High	High	High
Product mix diversity	High	High	Medium	Low
Time spent in purchasing	High	Medium	Medium	Low
Payment easiness	High	High	Medium	Low
Customization of Product	Low	Low	Low	High
Impersonality	High	High	Medium	Low
Purchasing environment	Medium	High	Medium - Low	High-Medium-Low
Product standards	High	High	High-Medium	High-Medium-Low
Price	Low	Medium	Low	High

Source: Farina, Nunes and Monteiro (2005b)

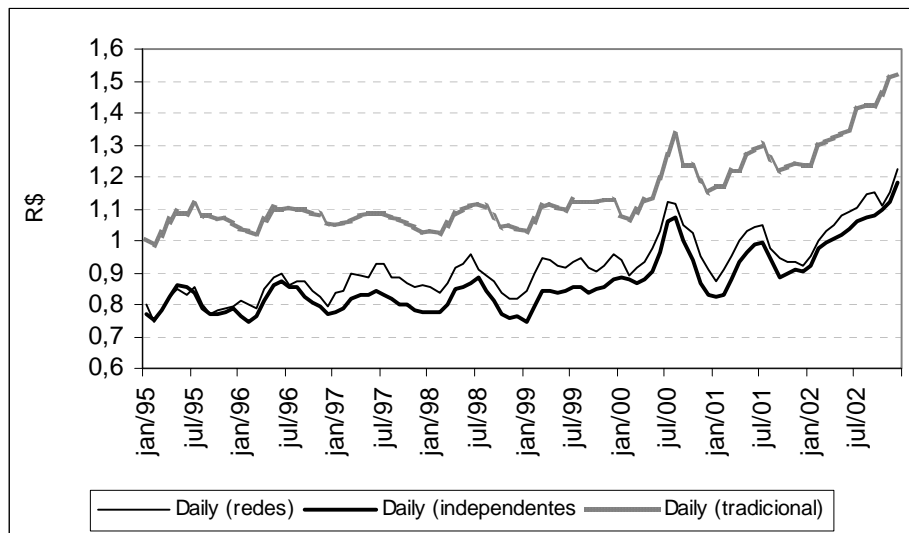
The competitive game in the food retail can be understood in two stages. First retailers decide where the stores of each kind will be located. In the second stage, when number and characteristics of stores are given, retailers compete in price, services and the environment in which the consumer accomplishes the purchases.

Big chains generally include hypermarkets, supermarkets and convenience stores. As a result, the firms have the capacity of exploring (i) the consumers' propensity in pay for different attributes and (ii) the economies of scale and scope associated with centralized systems of distribution and purchase. Hypermarkets present smaller marginal costs in comparison to other kinds of store due to scale and scope economies, smaller level of convenience and factors related to urban location. Hypermarkets compete to each other generally via prices. Supermarkets, on the other hand, are located in urban areas (neighborhoods) and offer convenience and good environment. Costs and prices are larger in supermarkets in comparison to hypermarkets.

⁸ Capillarity means the presence of stores in the consumer's neighborhood and their diffusion in the urban space. The metaphor is related to capillary vessels taking blood to cells. Product mix diversity is related to the number of products and brands available to costumers. Payment easiness refers to the acceptance of different means of payment, besides cash (credit cards, debt cards, bank checks). Customization of product is the ability to shape products according consumers will (size, colors, meat cuts). Impersonality is negatively related to customer's acquaintance with owners or employees of stores. The customer can, for example, believe that a clerk sales the best products to known assiduous people and the worst to unknown sporadic buyers. Purchasing environment includes facilities offered to customers, temperature and light in the store, cleanliness, displays and visual orientation.

Independent supermarkets are also located in neighborhoods. Some costs are higher in comparison to chain supermarkets due to the absence of economies of scale, but other costs are smaller such as marketing costs. Despite the general believe that independent supermarkets are less efficient than big chains, the average price of some food products at independent stores has been lower than the average price of chain stores (see graphic below). This evidence also confirms a previous research developed in Minas Gerais (Southwestern Region, Brazil) for a basket of food staples (Borges,2003).

Graph 1: Price Evolution - Chains, Independent Supermarkets and Traditional Retail - Bundle of Daily Products. Municipal District of Sao Paulo. Jan/1995 - Dec/2002



Source: Farina, Nunes e Monteiro (2005b)

It is worth noting that supermarkets (be it independent or related to a chain) generally reflect neighborhood tastes and lifestyles. As a result, the simple transposition of a given store for other place can represent an unsuccessful option. In some cases chains are able to reproduce just satisfactory the specific characteristics of stores of independent supermarkets.

The traditional retail is the most heterogeneous. Average costs probably are larger than in other formats. This kind of retailer presents the nearest store to the household.

Supposing two or more hypermarkets disputing consumers in one given area, it is plausible that such firms establish a Bertrand's Game. In this case, price is equivalent to the marginal cost. Chain supermarkets are *price makers* once they offer differentiated goods

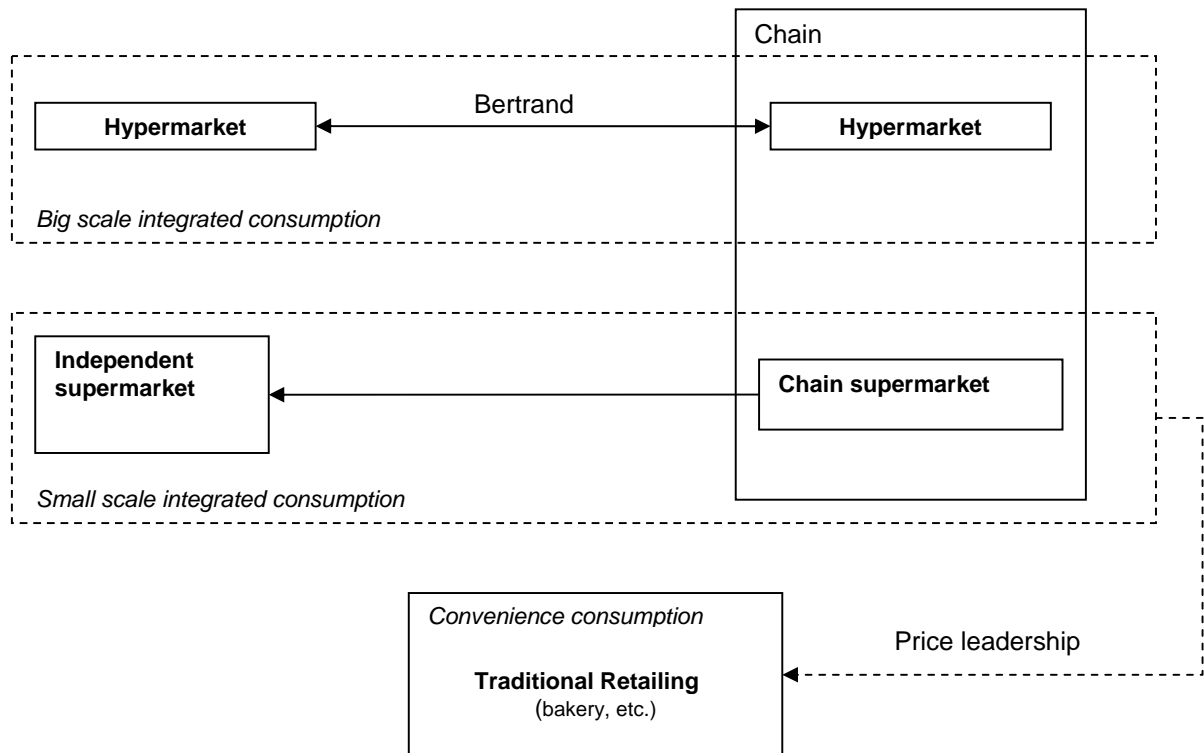
and additional services, being able, therefore, to set prices above the marginal cost. Independent supermarkets follow the chain leaders, tying prices to their rivals. Traditional retailers behave as *price takers* in a price leadership model.

On consumer's point of view, the modern retail (supermarkets) and the traditional retail (bakery, butcher shop, etc.) represent distinct markets. Such distinction is based on (i) the purchase's description (whether immediate or not), and (ii) the transactional costs involved in the acquisition of a basket of goods. As a result, one is able to identify the *integrated market* – the rational consumer purchases a basket of goods in an environment of low transactional costs and no immediate consumption – and the *convenience market* – the consumer, driven by the need of immediate consumption, purchases a reduced basket of goods.

In relation to *integrated consumption*, one should note that a purchase in a hypermarket differs of that made in a small supermarket. We define the first as *big scale consumption*, and the second as *small scale consumption*.

These relations are summarized in the illustration below.

Illustration 1: Competition in the food retail



Consumers consider the net utility of goods (utility less the purchase costs) in each store. An individual whose preferences present usual properties (convexity, continuity, etc.) allocates his income in products of stores of distinct kinds. The consumer reaches the balance when the marginal utility is alike in each retailer's category. Thus, *different categories are compatible*.

It follows that the equilibrium is achieved when prices in each category reflect the differences in net utilities. Differences in prices for a same product can coexist, being efficient in the presence of heterogeneous individuals. Thus, *the consumer behavior is important for the explanation of the survival of convenience stores and independent supermarkets. However, is not enough. Chains are able to reproduce some of the characteristics presented by the small retail while keeping cost advantages related to economies of scale and scope*.

3. Small scale integrated consumption

The empirical evidence does not support the theory of disappearance of small retailing in response to the expansion of chain supermarkets.⁹ Furthermore, there are indications that the implicit efficiency of big chains, i.e. smaller prices to consumers, is not confirmed, at least in the big metropolitan areas. This section investigates the survival and the pricing mechanisms of independent supermarkets. The basic assumption is that *small scale integrated consumption is local*. We based our analysis in two previous researches: Zhu et al (2005) and Chen (2003).

Consumers are located along a straight line of unitary length. There are two retailers (B and C). Without loss of generality, we suppose that C is located in the origin and B is situated in the opposite extremity. Retailer C corresponds to a hypermarket that commercializes product 1 (integrated). Retailer B is a small independent supermarket that commercializes product 2 (convenience). Each consumer purchase at most one unit of each product, being v_i the reservation value for product i ($i = 1, 2$).

Following Zhu et al (2005)'s approach, consumers are segmented according to two dimensions: *income* and *interest in the integrated product*.

Regarding income, α represents the proportion of high income consumers (rich consumers). Such consumers present reservation value for product 2 $v_2 = H > 0$. On the other hand, $(1 - \alpha)$ corresponds to the proportion of low income consumers (poor consumers). These consumers have $v_2 = L < H$.

Concerning the interest in the integrated product, β refers to the proportion of consumers who assign a non-negative reservation value to product 1 ($v_1 > 0$). On the other hand, $(1 - \beta)$ indicates the proportion of consumers who assign $v_1 = 0$. The first kind of consumer represents the *integrated consumer* and the second corresponds to the *purely convenient consumer*. It is worth noting that all consumers demand product 2, but only a proportion of them demand product 1.

The table below summarizes the concepts:

⁹ Ibid note 2

Table 2: Consumption dimensions

		consumer	
		rich	poor
consumer	integrated	$\alpha.\beta$	$(1-\alpha).\beta$
	purely convenient	$\alpha.(1-\beta)$	$(1-\alpha).(1-\beta)$

Consumers are also differentiated in terms of transportation cost. A rich consumer incurs cost $t > 0$ per traveled unit. On the other hand, poor consumers do not incur in transportation costs.

In this model the hypermarket (retailer C) plans to build a chain supermarket (retailer A) in some point close enough to its own store. Retailer A is intended to offer the convenience product. Retailers C and A present constant marginal cost $k > 0$. Retailer B presents constant marginal cost $k_0 > 0$.

Previous to the construction of the chain supermarket, each retailer operates in a market segment, i.e. there is no direct competition between B and C. The hypermarket competes for prices according to Bertrand's Model. The independent supermarket has a local monopoly.

When A initiates its operation, the competitive dynamics should be reexamined. The following game is then set:

- Retailer C establishes its price according to Bertrand's Model.
- Retailers A and B establish simultaneously its prices according to *Hotelling's* principles.
- Each consumer knows such prices and establishes a *shopping plan*.

In consonance with Zhu et al (2005) it is assumed that the surplus of integrated consumers when buying product 1 is sufficiently high so that all such consumers indeed purchase product 1. Thus, since all the integrated consumers travel to the hypermarket (retailer C), there is a larger concentration of rich consumers in the neighborhood of A who not only

demand the convenience product (product 2), but also present a relatively small price elasticity – existence of transportation costs.

Hypothesis 1: *retailer A has a sufficiently strong incentive of setting higher prices in order to capture the surplus associated to rich consumers.*

It follows that the price established by A (P_A) is higher than the price of B (P_B). Consequently, we infer that:

- Poor integrated consumers purchase product 2 from retailer B (smaller price).
- Rich integrated consumers purchase product 2 from A if P_B is not low enough so that it can compensate the transportation cost.

Formally, a rich integrated consumer located in $x \in [0,1]$ purchases product 2 in A if:

$$(1) \quad P_A < P_B + (1-x).t$$

Isolating x:

$$(2) \quad x = \frac{P_B - P_A + t}{t}$$

Where $t \neq 0$ and $t > (P_A - P_B)$

- Poor convenient consumers purchase product 2 from retailer B (smaller price).
- Rich convenient consumers purchase product 2 from A or B. A consumer located in $y \in [0,1]$ purchases product 2 from A if:

$$(3) \quad P_A + y.t < P_B + (1-y).t$$

Isolating y:

$$(4) \quad y = \frac{P_B - P_A + t}{2.t}$$

Where $t \neq 0$ and $t > (P_A - P_B)$

These relations lead to the following profit functions for retailers A and B:

$$(5) \quad \pi_A = [\alpha.\beta.x + \alpha.(1-\beta).y].(P_A - k)$$

$$(6) \quad \pi_B = [(1-\alpha) + \alpha.\beta.(1-x) + \alpha.(1-\beta).(1-y)].(P_B - k_0)$$

Solving the profit maximization problem:

$$(5') \quad P_A = \frac{P_B + t + k}{2}$$

$$(6') \quad P_B = \frac{P_A + k_0 - \phi}{2}$$

$$\text{Where } \phi = \left(\frac{2.(1-\alpha) + \alpha.(1-\beta)}{2.\alpha.\beta + \alpha.(1-\beta)} \right).t$$

Therefore,

$$(7) \quad P_A = \frac{k_0 + 2k + 2t - \phi}{3}$$

$$(8) \quad P_B = \frac{2k_0 + k + t - 2\phi}{3}$$

$$\text{Where } \alpha(1-\beta) > \frac{2t}{k_0 + 2k + 3t} \text{ and } \alpha(1-\beta) > \frac{4t}{2k_0 + k + 3t}$$

Supposing $k > k_0$ we have $P_A > P_B$. The independent supermarket establishes a smaller price in comparison to the chain supermarket.

Supposing $k < k_0$ the condition $P_A > P_B$ just verifies for a subset of values of ϕ (subset of values of α and β). Specifically one should observe $\alpha < \alpha'(\beta) \equiv \left(\frac{2t}{k_0 - k} \right) \cdot \frac{1}{(1+\beta)}$, where

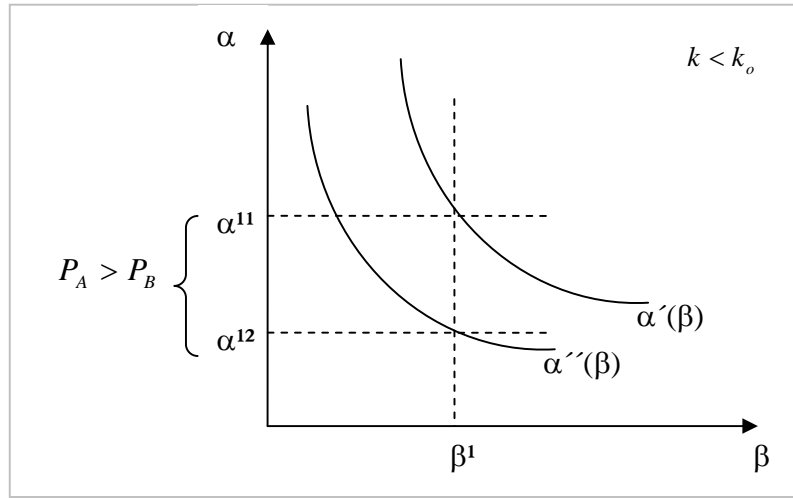
$\alpha'(\beta)$ is a decreasing function of β . On the other hand, x and y are restricted to the interval $[0,1]$ thus $\alpha > \alpha''(\beta) \equiv \left(\frac{2t}{(k_0 - k) + 3t} \right) \cdot \frac{1}{(1+\beta)}$. Therefore, there is an interval

$(\alpha''(\beta), \alpha'(\beta)) \subset [0,1]$ for which $\forall \alpha \in (\alpha''(\beta), \alpha'(\beta))$ generates an equilibrium $P_A > P_B$.¹⁰

The graphic below illustrates such equilibrium:

¹⁰ Note that we take the restrictive assumption that $0 < t \leq \min\left(k, \frac{(k_0 - k)}{2}\right)$.

Illustration 2: Relation between α and β



1.1. Expanding the analysis: Vertical relations and buying power

Following Chen (2003)'s approach, consider the existence of a monopolistic producer who manufactures product 2. The producer's marginal cost is constant and normalized at zero.

The supplier sets a contract in the form of a tariff in two parts. F_i is the fixed rate paid by retailer i and w_i is the unitary price paid to the producer by retailer i ($i = A, B$). It follows that:

$$(9) \quad k = c + w_A$$

$$(10) \quad k_0 = c_0 + w_B$$

Where c, c_0 represent marginal costs associate to the retail activity. $c > c_0$.

We consider explicitly the existence of buying power: retailer A, as a member of a larger corporation, has the ability to receive, through a smaller wholesale price and/or smaller fixed rate, a larger bit of the joint profit generated by the transaction between retailer and producer. On the other hand, the small independent supermarket does not have buying power.

The analysis is accomplished in two simultaneous stages:

- Producer perform a "take or leave it" offer to retailer B

- Contract between producer and retailer A is established through a negotiation process.

As Chen (2003), we apply a Nash's axiomatic approach to the bargain problem between producer and retailer A: (i) the contract is efficient, i.e. it maximizes the joint profit and (ii) the joint profit is divided according to the rule γ .

The maximization problem and the first-order condition for retailer A are:

$$(11) \quad \text{Max} \pi_A = [\alpha \cdot \beta \cdot x + \alpha \cdot (1 - \beta) \cdot y] \cdot (P_A - c - w_A) - F_A$$

$$(12) \quad \text{FOC} : \left(\frac{\alpha \beta}{t} + \frac{\alpha(1 - \beta)}{2t} \right) (-2P_A + P_B + t - c - w_A) = 0$$

The joint profit associate to the transaction is given by:

$$(13) \quad \pi_{\text{join}} = [\alpha \cdot \beta \cdot x + \alpha \cdot (1 - \beta) \cdot y] \cdot (P_A - c)$$

Applying (2) and (4) and maximizing regarding to w_A :

$$(14) \quad \frac{\partial P_A}{\partial w_A} \cdot (-2P_A + P_B + c + t) = 0 \Rightarrow \frac{\partial P_A}{\partial w_A} \cdot w_A = 0$$

Note that $\frac{\partial P_A}{\partial w_A} \neq 0$, so $w_A = 0$.

The joint profit is divided according to the rule γ :

$$(15) \quad F_A = (1 - \gamma) \cdot \pi_{\text{join}} \Rightarrow \pi_A = \gamma \cdot \pi_{\text{join}}$$

Simultaneously to the bargain process, the producer makes an offer to retailer B. The producer maximizes its total profit (π^P) given the restriction that retailer B get a non-negative profit.

$$\text{Max} \pi^P = (1 - \gamma) [\alpha \cdot \beta \cdot x + \alpha \cdot (1 - \beta) \cdot y] \cdot (P_A - c) + [1 - \alpha + \alpha \beta (1 - x) + \alpha (1 - \beta) (1 - y)] \cdot w_B + F_B$$

Subject to $[1 - \alpha + \alpha \beta (1 - x) + \alpha (1 - \beta) (1 - y)] (P_B - c_0 - w_B) - F_B \geq 0$

Solving the maximization problem:

$$(16) \quad w_B = (1 - \gamma) \cdot (P_A - c)$$

Replacing (7), and applying (9) and (10),

$$(17) \quad w_B = \frac{(1-\gamma)}{(2+\gamma)}(c_0 - c + 2t - \phi)$$

As a result:

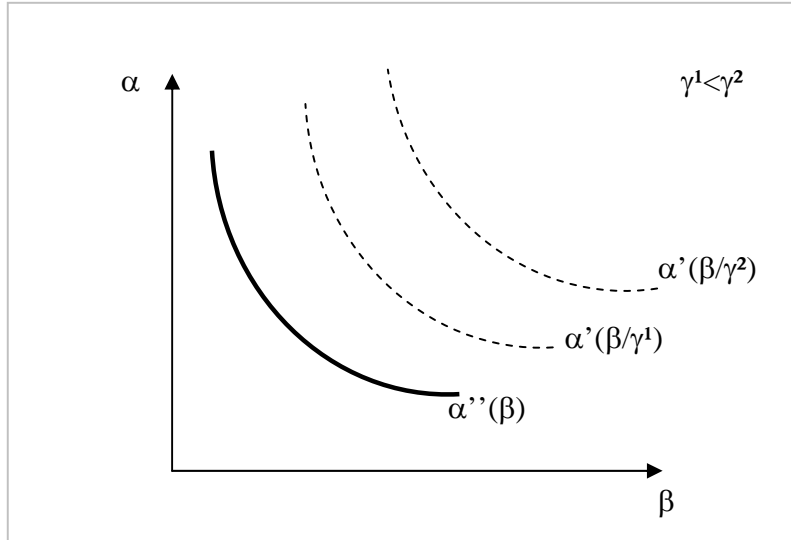
$$(18) \quad P_A = \frac{c_0 + (1+\gamma)c + 2t - \phi}{2+\gamma}$$

$$(19) \quad P_B = \frac{2c_0 + \gamma.c + (2-\gamma)t - 2.\phi}{2+\gamma}$$

In this case, the condition $P_A > P_B$ occurs when $\alpha \in (\alpha''(\beta), \alpha'(\beta))$,
 $\alpha''(\beta) \equiv \left(\frac{2t}{(c_0 - c) + 3t} \right) \cdot \frac{1}{(1+\beta)}$ and $\alpha'(\beta) \equiv \left(\frac{2t}{(c_0 - c) + (1-\gamma)t} \right) \cdot \frac{1}{(1+\beta)}$.

In comparison to the previously result, the inferior limit– $\alpha''(\beta)$ –does not change. On the other hand, $\alpha'(\beta)$ is an increasing function of γ : as γ increases, the interval $(\alpha''(\beta), \alpha'(\beta))$ also increases.

Illustration 3: Effect of an increase of γ



Strategic interaction and price equilibrium

Just as Chen (2003), we can analyze the effects of an increase in buying power. Such increase refers to an exogenous elevation of γ .

Based on (17) and (19):

$$(20) \quad \frac{\partial w_B}{\partial \gamma} = -3 \cdot \frac{c_0 - c + 2t - \phi}{(2 + \gamma)^2}$$

$$(21) \quad \frac{\partial P_A}{\partial \gamma} = \frac{c - c_0 - 2t + \phi}{(2 + \gamma)^2}$$

$$(22) \quad \frac{\partial P_B}{\partial \gamma} = 2 \cdot \frac{c_0 - c + 2t - \phi}{(2 + \gamma)^2}$$

For any value α restricted to $(\alpha''(\beta), \alpha'(\beta))$: $\frac{\partial P_A}{\partial \gamma} < 0$, $\frac{\partial P_B}{\partial \gamma} < 0$ and $\frac{\partial w_B}{\partial \gamma} < 0$.

Thus, within the interval that guarantees $P_A > P_B$, retailer A reduces its price as γ increases. Retailer B, on the other hand, also reduces its price, being such reduction explained by the reduction of w_B by the producer.

Consider an elevation of γ : in this case, trying to obtain a more favorable position in the negotiations with retailer A, the producer reduces the price charged from retailer B (w_B) what generates an incentive for a price reduction of B (P_B) and, as a consequence, an elevation of B's demand in detriment of A. As a result, A has an incentive of reducing its price as an attempt to maintain some of its consumers.

Therefore, the increase of the buying power performs two effects on the market: (i) it reduces independent supermarkets' marginal cost via reduction of supplier's price and (ii) it enlarges the interval $(\alpha''(\beta), \alpha'(\beta))$.

4. Trust and the price-convenience equilibrium

Section 3 presents a model in which independent supermarkets are able to set lower prices in comparison to chain supermarkets, even in the presence of cost advantages for the chains. Nevertheless, the analysis of the retail competition is not complete.

Farina, Nunes and Monteiro (2005a) argued that small retailing survives in spite of having higher prices because it offers more *convenience* to consumers, i.e. it presents lower purchasing costs. As was stated in section 2, purchasing costs include attributes other than the food product itself.¹¹

Accordingly, the food retailing equilibrium is characterized as a *price-convenience equilibrium*. The price in the traditional retail is higher than the supermarket's price, what means that consumers may pay a premium for shopping in more convenient stores. Thus, one can account for a trade-off between prices (lower in the supermarkets) and purchasing costs (lower in the traditional retail). Since consumers have distinct preferences regarding price and convenience, and even the same consumer in different circumstances can choose different retailing formats, it exists, in the market, space for the traditional retail (fringe) and the self-service stores (nucleus).

The fringe and the nucleus differ fundamentally in relation to the nature of purchasing costs they present. In particular, a remarkable feature of traditional retail is its ability to adapt products to consumer's needs or desires. This kind of retail has the nearest stores to household. As a consequence, transactional attributes such as high capillarity, low time spent in purchasing, high customization of product and low impersonality may form a reinforced pattern which is the ground for the development of personal relations between shoppers and consumers. We define these relations as trust.

One should note the restrictive nature of this definition and its implications. We assume that the more convenient format generates a repeated interaction pattern which leads to a further reduction in purchasing costs (more convenience) by means of a closer relationship between shoppers and consumers. One fundamental aspect of this relationship may be what was once called the "virtual wallet".¹² Under this circumstance, the increase

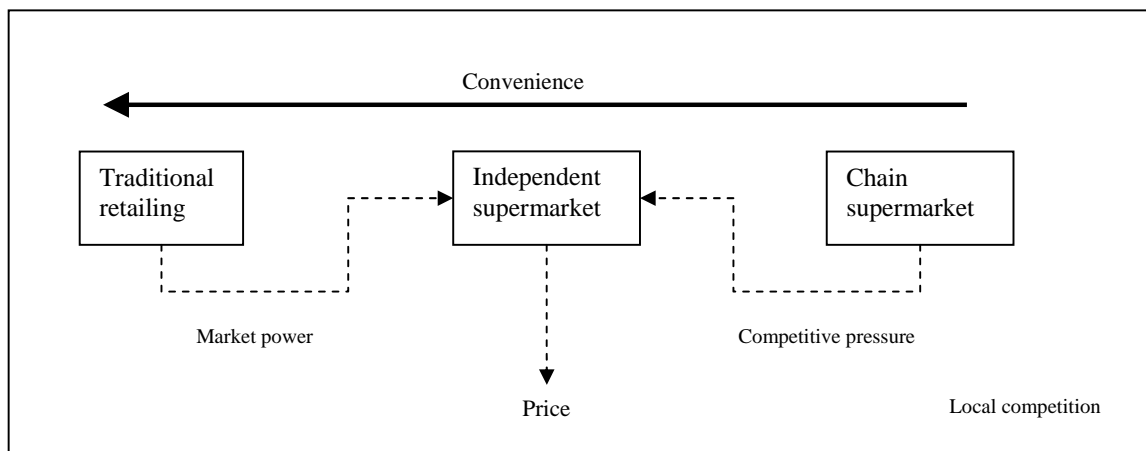
¹¹ See Table 1, page 3

¹² D'Andrea et al (2006:683): *emerging consumers commonly "come up short" on small purchases and rely on their "virtual wallet" at small-scale retailers who essentially offer a type of informal credit by allowing regular customers to make up these small differences on their next shopping trip – usually the next day or shortly thereafter*. One should note that such informal credit may just exist after a period of repeated interaction.

in convenience may generate an increase in market power for traditional retailers that have some degree of local monopoly. Consequently, *in this specific panorama, trust increases the market power of retailers.*

When analyzing the independent supermarkets one should note that this retail format lays in somewhere between the traditional retailing and the chain supermarket. Although it has a self-service format, it also presents ‘traditional’ characteristics, for instance, low impersonality in stores controlled by owner-managers. As a result, independent supermarkets have to balance the market power that arises from convenience and the competitive pressure that comes from the expansion of chain supermarkets. The first has an upward effect in prices. The second, in consonance with the model in section 3, has a downward effect in prices. The equilibrium price is undetermined until these forces are balance, conditional on the degree of local competition. The illustration below summarizes this feature.

Illustration 4: Equilibrium price – Independent supermarkets

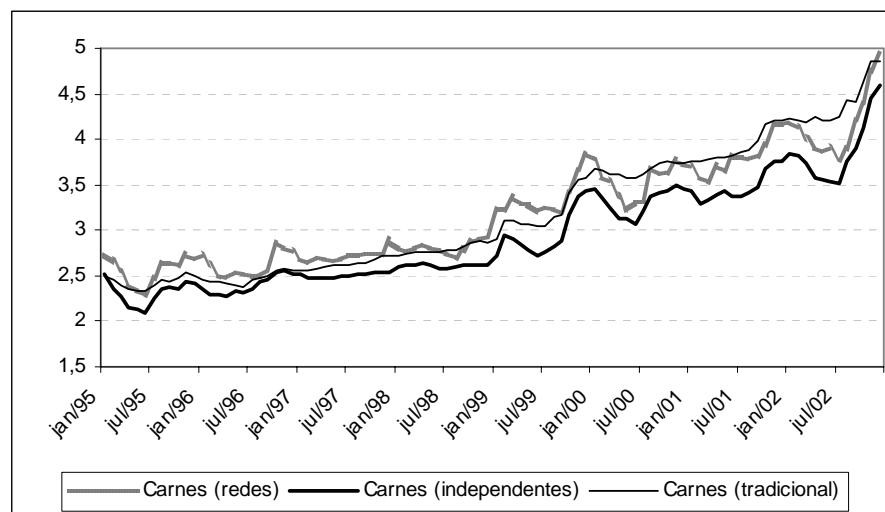


5. Empirical Evidence

In this section we analyze some empirical evidence. We do not intend to formally test the model presented in section 3. We examine the offer price of *acém* (meat) at the

Metropolitan Region of Sao Paulo (RMSP). As was shown elsewhere ¹³ the price of meats in Sao Paulo varies depending on the store's format (see graph below).

Graph 2: Price Evolution - Chains, Independent Supermarkets and Traditional Retail - Meats. Municipal District of Sao Paulo. Jan/1995 - Dec/2002



Source: Farina, Nunes e Monteiro (2005b)

Following Fava and Pereda (2006) we estimate a linear multiple regression model. The dependent variable is the offer price of *acém* (meat) with information from IPC-Fipe ¹⁴ of december/1995 – 2003. Besides *independent*, the explanatory variables are *dummies* for the stores' type (hypermarket, supermarket, medium size market, small size market and traditional) ¹⁵ and *dummies* that account for the average income of households in a district. ¹⁶ The model is:

$$P_j = \alpha + indep + \sum_{i=1}^5 \beta_i s_i + \sum_{m=1}^7 \gamma_m E_m + \varepsilon_j$$

¹³ Farina, Nunes and Monteiro (2005b)

¹⁴ Consumer Price Index (IPC), prepared by the Foundation Institute of Economic Research (Fipe) for the Municipal District of Sao Paulo.

¹⁵ The classification of stores' types is based on that established by ABRAS (Brazilian Supermarket Association). For more details see Fava and Pereda (2006).

¹⁶ The districts in the Metropolitan Region of São Paulo are divided in six groups according to the household's average income. The first group is the richest and the last is the poorest. For more details see Fava and Pereda (2006).

Where,

- P_j is the price of *acém* in store j
- *indep* is a *dummy* variable (it is 1 if the self-service store does not belong to a chain).
- s_i is a *dummy* variable (it is 1 if the store belongs to income group i).
- E_m is a *dummy* variable (it is 1 if the store's type is equal to m).

The results are shown in the table below:

Table 3: Linear multiple regression model – dependent variable: offer price of *acém* (meat)^{17,18}

month	n	R ²	indep	s1	s2	s3	s4	s5	Hip	Big	Medium	Trad	Const
dez/95	158	0,1679	-0,221*	0,494*	0,314*	0,383*	0,297	0,198	0,202	-0,111	-0,065	0,076	2,441*
dez/96	158	0,236	-0,181*	0,348*	0,259*	0,231*	0,157	-0,012	-0,097	0,045	0,041	0,046	2,534*
dez/97	161	0,202	-0,237*	0,224*	0,088	0,152	0,115	0,026	0,074	0,090	0,057	-0,004	2,871*
dez/98	160	0,219	-0,252*	0,228*	0,087	0,153	0,087	0,012	0,103	0,054	0,014	0,019	2,870*
dez/99	155	0,035	0,007	0,242*	0,213	0,209	0,180	0,172	-0,076	-0,010	-0,033	-0,038	3,694*
dez/00	161	0,262	-0,213*	0,481*	0,189	0,234	0,152	0,057	0,074	-0,002	0,158	-0,001	3,851*
dez/01	161	0,337	-0,343*	0,534*	0,223	0,275*	0,137	0,019	-0,036	0,052	-0,152	-0,006	4,345*
dez/02	146	0,241	-0,374*	0,276	0,147	0,191	0,003	-0,026	0,138	0,059	0,113	-0,081	5,344*
dez/03	139	0,295	-0,313*	0,483*	0,250	0,354*	0,224	-0,019	0,076	0,101	0,120	0,056	5,528*

The estimation is an attempt to measure the effect of being independent on the price set by retailers. When one considers the coefficients associate to *indep* over different periods of time, it is possible to have an idea about the dynamic of competition.¹⁹ If the competitive pressure of chain supermarkets increases, one expects that the price of independent supermarkets decreases, given a fixed level of trust.

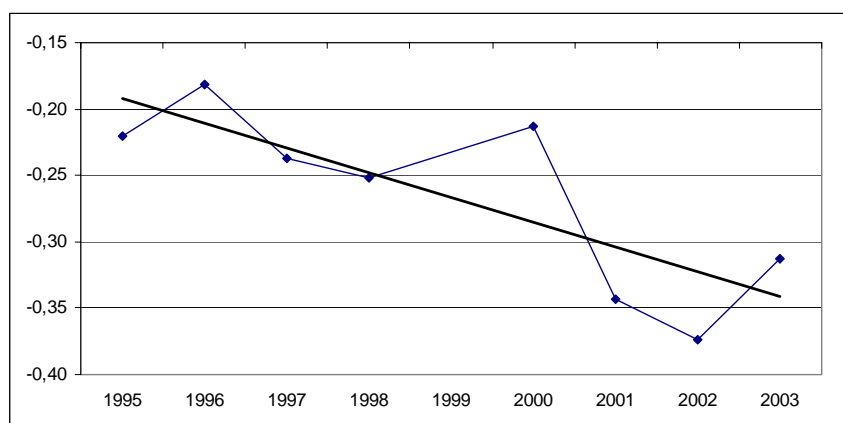
The graph below presents the coefficients of *indep*. It is worth noting that the effect of independency on price has increased over time, i.e. prices of independent supermarkets are lowering over the years when controlling for other factors.

Graph 3: Effect of independency on retailing prices of *acém* – Metropolitan Region of Sao Paulo, 1995-2003.

¹⁷ We have excluded the *dummies* for small size and the income group s_6 .

¹⁸ * indicates significance (5%).

¹⁹ It is worth noting that the expansion of chain supermarkets has been intense. See Farina and Nunes (2002).



6. Conclusion

The retailing concentration in Brazil occurs through the acquisition of relatively smaller supermarkets chains by bigger chains, together with the increase of independent supermarkets and the non significant reduction of traditional retailers. The national market can be characterized as an oligopoly with competitive fringe. The nucleus encompasses the big chains and the fringe is represented by the traditional retailing and the independent supermarkets. The paper focuses on the survival of independent supermarkets and its price mechanism.

The theoretical analysis states that an increase in big chains' buying power performs two effects: it reduces independent supermarkets' marginal cost via reduction of supplier's price and it enlarges the interval $(\alpha''(\beta), \alpha'(\beta))$ emphasizing the reduction on independent supermarkets' price. However, when addressing the effect of trust on the equilibrium price, the net effect cannot be determined. The empirical evidence for *acém* indicates that the expansion of chain supermarkets may be related to a decrease in independents' price.

Generally speaking, the analysis brings to light the *heterogeneity of the competitive fringe* in the oligopoly model of Brazilian retailing. Regarding such examination, the idea that “*the increase in buying power just leads to lower retailing prices if the antitrust authorities watch over the maintenance of the competitive fringe*”²⁰ does not find fully

²⁰ Goldberg, 2006:225

support. The survival of independent supermarkets seems to occur even in periods of concentration of big chains.

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