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**Sixth Joint Conference on  
Food, Agriculture and the Environment  
(in honor of Professor Emeritus Philip M. Raup)  
Minneapolis, Minnesota  
August 31 - September 2, 1998**

**Hosted by the**

**Center for International Food and Agricultural Policy  
University of Minnesota  
Department of Applied Economics  
1994 Buford Avenue\332 ClaOff Building  
St. Paul, Minnesota 55108-6040 U.S.A.**

***COUNTERVAILING POWER AND ANTITRUST POLICY IN THE FOOD  
SYSTEM***

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# **Countervailing Power and Antitrust Policy in the Food System**

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This paper has been prepared for the conference: " Food, Agriculture and the Environment",

August 31- September 2, 1998- Minneapolis, Minnesota.

## Abstract

Recent contributions to the issue of countervailing power have formally demonstrated that imperfectly competitive market structures in retailing have different welfare implications from those hypothesized by Galbraith (1952) according to which increasing concentration in retailing may offer social benefits. Recent works in this area show that greater concentration at the retail level may afford retailers a simultaneous increase in both their buying and selling power. Whilst the former improves their relative bargaining position, the latter allows for increased price-cost margins. This recent literature suggests that retailing concentration may have a negative impact on consumer welfare since the effect of increased price-cost margins is sufficiently greater than the downward pressure on intermediate prices generated by increases in retailers' 'buying power'. As a result, greater concentration at the retail level may lead to higher final prices and lower social welfare.

In this paper, we argue that the bargaining models of the manufacturer-retailer relationship used in these works take into account only partially the sources of retailers' bargaining power. In fact, they include only the source associated to the number of retailers. However, as indicated by a massive trade and applied literature, several factors determine the relative bargaining power of manufacturers and retailers. One crucial factor is given by the presence of *vertical competition* between manufacturers' brands and retailers' private labels. This form of competition represents a further source of bargaining power for retailers which may reinforce the buying power effect and imply conclusions more favorable to the countervailing power hypothesis. To explore this hypothesis, we develop a model which differs from previous ones by focusing on market settings where vertical competition affects the relative bargaining positions and bargaining outcomes.

The paper examines the negotiation process between a manufacturer and  $N$  retailers on the transfer price as a Nash bargaining game and determines the outcome by the Nash bargaining solution. We assume that vertical competition decreases the profit levels and the disagreement payoff of the manufacturer. We also assume that vertical competition increases the disagreement payoff of retailers while their profits remain unchanged. It is shown that vertical competition increases retailers' bargaining power, reduces equilibrium transfer prices and hence equilibrium retail prices. In particular, our results show that final prices are lower when vertical competition is more intense for any given number of retailers. This means that the higher bargaining power associated to vertical competition plays a positive role for consumers when their interest is measured in terms of retail prices.

## 1. Introduction

Some recent works have reexamined the issue of countervailing power and its implications for public policy. Two reasons explain the renewed interest in the controversial hypothesis put forward by Galbraith in 1952 and its relevance for antitrust decisions.

First, the competitive environment in the retail industry has profoundly changed in the most countries. Concentration levels in the retail sector have increased substantially and large retailers increasingly act as strategic players adopting a set of sophisticated non-price strategies. As a result, the debate on the effects of these changes on consumer prices and social welfare becomes a topical issue (Tordjman, 1994; Wrigley 1992).

The crucial question is whether concentration in retailing should become a major concern for antitrust and competition policy. The countervailing power hypothesis predicts that such a power is not a problem. This implies that no intervention is needed by the antitrust authorities. On the contrary, increasing concentration in retailing may offer social benefits. Consolidation in the sector can enhance retailer's ability to obtain discounts from manufacturers and allow lower final prices for consumers as a result of intense competition between retailers (Galbraith, 1952, 1954, 1980; Hunter, 1958).

An alternative view is less optimistic about the effects of increased retail concentration. Greater concentration at the retail level may afford retailers a simultaneous increase in both their buying and selling power. Whilst the former improves their relative bargaining position, putting downward pressure on intermediate prices, the latter allows for increased price-cost margins. If the second effect sufficiently dominates, increased concentration may lead to higher final prices and lower social welfare.

Clearly, the implications for public policy are quite different. If the effects of retail concentration are negative, then competition authorities should not remain impassive. Contrary to what suggested by Galbraith's (1952, 1954, 1980) notion of countervailing power, this latter view suggests that an appropriate monitoring and in some situations challenging the competitive environment of the retail industry might be necessary.

In spite of the importance of the consequences of concentrated retailing and stronger large retailers, previous research is scarce and key questions remain unanswered both at the empirical and the

theoretical level.

As Sexton and Lavie (1997) pointed out countervailing power is only now re-emerging as an important subject of economic inquiry following years of neglect.

Similarly, competition authorities seem rather late in focusing these issues. Competition authorities in both the U.S. and Europe have traditionally been confronted with manufacturers and suppliers exercising competitive advantages over retailer. The recent structural changes in the retail industry calls for a reexamination of traditional competition law and policy (Borghesani *et al.* 1998).

The second reason which explains the new interest for the concept of countervailing power is due to the availability of new analytical tools provided by bargaining game theory (Binmore *et al.*, 1986; Davidson, 1988; Dobson, 1995). Recently, some studies have begun to explore the predictions of the Galbraith's hypothesis by formal modelling the issue within the framework of bargaining game models (von Ungern-Sternberg, 1996; Dobson and Waterson, 1997).

These works adopt the same two-stage approach. In the first stage a (single) supplier bargains with oligopolistic retailers about the wholesale price. The Nash bargaining solution is used to determine the bargaining outcome. In the second stage competition between the retailers determines the retail price and total sales volume. The works differ in the analysis of competition in the second stage. While von Ungern-Sternberg (1996) assumes either perfect competition or Cournot-Nash behaviour among retailers selling homogeneous services, Dobson and Waterson (1997) consider Bertrand-Nash competition between retailers selling differentiated services.

This literature tends to suggest that retailing concentration may have a negative effect on consumer welfare. This occurs because the effect of increased price-cost margins is sufficiently greater than the downward pressure on intermediate prices generated by increases in retailers' 'buying power'. As a result, greater concentration at the retail level may lead to higher final prices and lower social welfare.

In this paper we argue that the bargaining models of the manufacturer-retailer relationship used in these works take into account only partially the sources of bargaining power. In fact, they include only one source of bargaining power, that is the source associated to the number of retailers. However, a massive trade and applied literature indicates that several factors are at work in determining the relative bargaining power of manufacturers and retailers. One of these factors is given by the presence of *vertical competition* between manufacturers' brands and retailers' private labels. This form of competition is a crucial dimension of vertical relationships between manufacturers and retailers in advanced food systems and its consequences should be examined.

The theoretical analysis developed in this paper follows the bargaining models provided by recent literature. We describe the negotiation process between a manufacturer and  $N$  retailers and examine the determination of the transfer price as a Nash bargaining game. However, our analysis differs from previous ones as we focus attention on market settings where vertical competition affects the relative bargaining positions and bargaining outcomes.

Given the relevance of this phenomenon it is important to investigate its impact in order to account more completely for the factors which may be at work and to explore more appropriately the role of countervailing power in these market settings.

The paper is organized along the following lines. A brief survey of the recent formal works on the countervailing hypothesis is presented in Section 2. In Section 3, we first develop a simple bargaining game as a benchmark for analyzing the implications of vertical competition. A model with a market setting characterized by the presence of retailers brands and their consequences on bargaining outcomes and the equilibrium final price is then examined. The closing section provides some concluding remarks.

## **2. Literature review**

In this section, we provide a brief review of the recent literature which has reexamined the hypothesis of countervailing power by using the analytical tools provided by Nash bargaining games.

### *2.1 The debate on countervailing power*

The debate on the issue of retailers' 'buying power' and its implications for competition policy is not new. Galbraith (1952) put forward the hypothesis that in oligopolistic market structures the typical restraint on the exercise of market power is not provided by sellers' horizontal competition, but from the other side of the market by strong buyers.

In other terms, it is this countervailing power, not classical competition, the mechanism which effectively keeps firms' behaviour in concentrated markets in check. Thus, the policy implications of Galbraith's theory of countervailing power are that no intervention is needed by antitrust authorities. Countervailing power substitutes antitrust decisions (Adams, 1987).

Galbraith added that one of the most important manifestations of countervailing power is in the retail market. It should be noted that Galbraith was well aware that market structure in retailing had to be sufficiently competitive in order to get the benefits of countervailing power. In fact, his hypothesis is based on the assumption that "retailing remains one of the industries to which entry is characteristically free [...] where small firms can co-exist with larger competitors [...and where] the larger competitor [...] lives constantly under the threat of an erosion of its business by the more rapid growth of rivals and by the appears of new firms" ( Galbraith, 1980, p. 118).

As noted by Sherer and Ross (1990) an asymmetry on the buyer's side is needed for countervailing power might benefit the consumer. The buyer must be powerful enough to constrain the seller's prices. But, at the same time, they themselves must lack the power as resellers to depart from competitive pricing

In other terms, Galbraith's theory of countervailing power is a model in which enter two hypotheses. The first hypothesis regards the ability of strong buyers to obtain lower input prices from their suppliers. The second hypothesis regards whether the restraining influence of strong buyers on strong sellers can improve social welfare. Two forces are therefore at work. The first factor is a "buying power" (BP) effect . This effect is based on the fact that increasing concentration in retailing improves retailers' relative bargaining position and puts downward pressure on input prices. The second force at work is a "selling power" (SP) effect and depends on the intensity of competition at the retail stage. Imperfect competition allows retailers to set higher price-cost margins. Clearly, the outcome of greater concentration in retailing is welfare improving if  $BP > SP$ . This is the prediction of the countervailing power hypothesis. But in the case in which it is the selling power effect to dominate (  $BP < SP$  ) the ability of retailers to extract lower prices from their supplier is dominated by the negative effect due to their higher market power as sellers. As a consequence, final prices are higher and social welfare lower. Clearly, this is a situation which the antitrust authority would like to (and should) challenge.

In order to avoid misunderstandings, it should be noted that Galbraith was well aware that his policy implications hold only if retailers' margins remain at quasi-competitive levels as a consequence of easy conditions of entry into retailing. Retailers have to be disciplined to pass lower input prices on to final consumers. This happens only if the retail industry is sufficiently "contestable".

Thus, two different issues should be examined. The first one regards the rigorous formal analysis of the internal consistency of Galbraith's theory. That is whether and when the BP and the SP effects can result in welfare improvements. The second issue regards the empirical relevance of the



countervailing power theory, that is whether and why in actual market settings the retail industry may be sufficiently competitive so that  $BP > SP$ .

## 2.2 *Models of bargaining*

Although the hypothesis of countervailing power has a long-standing tradition, rigorous theoretical investigations of its predictions have been scarce. Only very recently, the issue has been investigated formally within the theoretical framework of game bargaining models. In the following sub-section, we review briefly two recent works which have examined the issue.

As we have seen in the previous subsection, two forces interact to drive the hypothesis of countervailing power. Therefore, the crucial task to analyse rigorously the hypothesis is to assess the relative importance of these two effects. The recent literature does this by adopting a two-stages approach. In the first stage, it is modelled the bargaining process between the producer and the retailers. In the second stage, the competition between the retailers themselves is analyzed.

Recently, von Ungern-Stenberg (1996) developed a model based on a monopolist supplying undifferentiated Cournot oligopolists. His results indicate that

$$w = F(N, \alpha)$$

+ -

where  $w$  is the intermediate price and  $\alpha$  is the exogenous degree of "bargaining power". His results show that the price  $w$  the retailers pay for the input, that is the producer's selling price, is a decreasing function of the retailers' bargaining power  $\alpha$  and an increasing function of the number of retailers  $N$ .

This result captures the idea that concentration in retailing is a source of bargaining power for retailers. In other terms, as  $N$  declines, the BP effect arises because the manufacturer faces larger retailers. Since he cannot afford to lose their high sales volume, he has fewer alternatives available. Hence, his dependence on any one of retailers increases and is thus willing to accept lower wholesale price. It should be noted that this is true for all of the levels of the retailers' (exogenous) bargaining power  $\alpha$ .

von Ungern-Sterberg shows that if competition among retailers in the second stage game is of the Cournot type, as  $N$  decreases the lower input prices are not sufficient to offset the increase in retailers margins. In other terms, while the retailer's input prices decrease with  $N$ , this decrease is

more than compensated by the increase in the retailers' own profit margin.

This does not happen in a model of perfect competition. If there is perfect competition in retailing, then the final price unambiguously decreases as the number of retailers decrease. This clearly depends on the fact that within a perfectly competitive framework the retailer's ability not to pass on price concessions to consumers is drastically curtailed.

von Ungern-Stemberg comments that a retail price decreasing in the number of retailers contradicts to the theory of countervailing power. He claims that the problem with this theory is that the retailers are able to extract lower prices from the manufacturer only as their number decreases. If, however, retailing concentration increases, the Cournot model predicts higher mark-ups which more than compensate the decrease in input prices.

According to this author, even if the retailers act as price takers in the second stage of the game, so that a decrease in their number will lead to lower final prices, even this result does not support Galbraith's hypothesis because "the driving force behind this result is the very strong (perfect) competition at the retailer level.

This conclusion is incorrect. It seems based on a misunderstanding of Galbraith's hypothesis since as we have seen in the previous subsection Galbraith just argued that countervailing power can have positive effects for the consumers only if there is a very intense competition at the retail level.

To assume that retailers are Cournot players changes a crucial assumption of Galbraith's theory. As a consequence, to find that Cournot competition results in a SP effect higher than the BP one is an useful analytical result but it has nothing to say about the internal consistency of the countervailing power hypothesis. This result cannot contradict Galbraith's theory.

An appropriate analysis should model competition at stage 2 by assuming, as Galbraith does, that retailers are disciplined by potential entry. If retailing is a contestable market, then the decrease in the number of players has no influence on the intensity of price competition. A Bertrand model would be more consistent with Galbraith's assumptions.

Another paper that has recently examined the issue of countervailing power is the work of Dobson and Waterson (1997). By using the same approach of von Ungern-Sternberg (1996) where retailers negotiate intermediate prices with a monopoly supplier, Dobson and Waterson assume Bertrand-Nash behaviour at stage 2. However, they consider the role of countervailing power within a market setting of imperfectly competitive retailers. Their intent is to focus on the consequences of differentiation in retailers' services.

They find that final prices fall following a reduction in the number of retailers only when retailer

services are viewed by consumers as very strong substitutes. In this case, retailer differentiation is small and increased retailer concentration does not lead to an appreciable increase in retailer selling power. The fall in the supplier's relative bargaining power may be sufficient to lead to a decrease in transfer prices and the consumer may benefit through lower final prices.

Thus, Dobson and Waterson's results suggest that greater concentration in retailing may be socially beneficial only if non-price competition, in addition to price competition captured by Bertrand behaviours, remains intense, that is if retailer services are perceived as highly substitutable.

Obviously, this conclusion is quite consistent with and support the theory of countervailing power. Dobson and Waterson points out that since retailers are quite involved in differentiation strategies, we cannot be assured that the effects of retail concentration are benign. On the contrary, they claim that there is strictly limited scope for countervailing power acting as a self-regulatory mechanism benefitting consumers. When services are only moderate or weak substitutes, greater concentration leads to higher final prices and has negative effects on social welfare.

Again, it should be noted that even the model provided by Dobson and Waterson has nothing to say about the theoretical consistency of the theory of countervailing power. Simply, it rigorously confirms the main argument provided by Galbraith, that if retailers obtain stronger bargaining positions as a consequence of greater concentration *and* there is intense competition between them, then greater concentration in retailing may be beneficial.

Dobson and Waterson (1997) also pointed out that even in these circumstances, the social benefits of countervailing power may not be realised as the supplier may seek to protect its profits by using a refusal to supply restraint to engage in exclusive trading. By refusing to supply other retailers in order to circumvent countervailing power, the supplier's action may serve against the public interest as retail service variety is lost and final price may be raised.

It should be noted that the role of exclusive trading is empirically much less relevant when manufacturers are interested in pursuing high levels of distribution density. This is the case of grocery products where the need to maximize the intensity of distribution, that is the number of outlets selling the product incentives manufacturers to reach agreements and selling to all of the potential retailers.

Our view, however, is that the models discussed thus far are unsatisfying in two ways. First, as noted, they are not conceptually accurate in modelling the countervailing power theory according to the assumptions claimed by Galbraith. Second, their analysis of the sources of bargaining power is incomplete. They do not address some of the most important features of advanced food systems.

For example, they do not incorporate the phenomenon of vertical competition.

The main point of this paper is to show that the presence of several sources of bargaining power may reinforce the buying power effect and imply conclusions more favourable to the countervailing power hypothesis.

To show this we follow the model provided by von Ungern-Sternberg. As noted, within the framework of the Cournot model, results compatible with the theory of countervailing power can be obtained only by assuming that the retailer's degree of bargaining power  $\alpha$  increases as the number of retailers decreases. This author also claims that he does not find particularly compelling to assume that  $\alpha$  decreases with  $N$ . However, this may be the case if there are other sources of bargaining power. As already pointed out, the model takes into account only the change in relative bargaining power associated with the number of retailers. As  $N$  declines the manufacturer has fewer alternatives available and this reduces its bargaining power relatively to retailers. In von Ungern-Sternberg's model the parameter  $\alpha$  can catch the consequences of retailers with stronger bargaining position but, obviously, it cannot be used to examine why this may happen being exogenously given.

A deeper analysis of the manufacturer-retailer bargaining is needed to examine the existence of different sources of retailers' bargaining power.

As indicated by an extensive literature, strong buyers restrain the pricing power of oligopolistic sellers in several ways. Oligopolists are prone to cut prices in order to land an usually large order, especially when they have excess capacity. Large buyers can exploit this opportunity. Large buyers also may play one seller off against the others to elicit price concessions. A strong, buyer, large enough so that the loss of his patronage is not a matter of indifference, is able to force concessions (Sherer and Ross, 1990). All these factors may be caught by the number  $N$  of retailers and, indeed, they are the sources of bargaining power explicitly quoted and analyzed by the models provided by von Ungern-Sternberg and by Dobson and Waterson.

However, other sources of bargaining power have been discovered as well as new ways of exerting it to gain advantage by retailers. A particularly important aspect of these relationships is the launch of private label programmes by an increasing number of retailers. The existence of private labels products and the resulting phenomenon of vertical competition is one of the main source of bargaining power for retailers.

Own- or private-labels (brands owned, controlled and sold exclusively by a retailer) are now present in an increasing number of product categories in grocery and food markets. They provide

acceptable quality at reasonable prices, of ten have a relevant innovative content and retailers are becoming more proficient at managing them (e.g. Raju *et al.*, 1995; Fitzell, 1982)

Retailer brands compete with manufacturer brands and add a new, vertical dimension of competition which we can label as *vertical competition* (Galizzi and Venturini, 1997) Retailer private label programs and the power that they impart to retailers vis-à-vis food manufacturers play a crucial role in the food system.

The impact of vertical competition on the relative bargaining position of manufacturers and retailers is emphasized by trade literature, applied research and anecdotal evidence. For example, Duke (1992) noted that there are several reasons why the food manufacturers supplying to the UK grocery retail industry held an extremely weak bargaining position: in addition to the relatively concentrated retail market, the manufacturer's lack of alternative distribution and the retailers's control over if, where, how and at what price manufacturer's goods are offered to the consumer, a further crucial reason is given by the retailer's use of own-label as an alternative input. As noted by Cotterill (1997), if large retailers are able to establish private label programs, this entry into the food manufacturing sector creates a new informed player and thus may very well lead to lower wholesale prices for not only private label but also branded food products.

It is interesting to note that Galbraith himself pointed out that the retail buyers have a variety of weapons at their disposal to use against the market power of their suppliers and that their ultimate sanction is to develop their own source of supply.

In some country, this source of power may be stronger than in others. This is the case of the UK where private-labels have reached the highest market shares. While there is debate about the convergence towards a unique model and whether the prevailing one will be the retailer-driven model of the UK or the manufacturer-driven model of the US, there is no doubt that the most food systems are now increasingly characterized by vertical competition and that private label products play a major role in determining the balance of power between retailers and branded food manufacturers (Connor, 1997, Cotterill, 1997, Wrigley, 1997).

Thus, several factors contribute to leave manufacturers with little bargaining power and therefore tend to enhance retailers' bargaining power. In particular, the consequences of vertical competition are particularly worth examining.

### 3. A model of bargaining with vertical competition

The considerations developed in the previous section suggest that it is worth exploring the fact that other sources of bargaining power may be at work in affecting bargaining positions independently or in addition to the number (and size) of retailers .

This section develops a simple model aimed at examining the consequences determined by the existence of a competitive environment characterized by vertical competition. The issues we want to address is whether vertical competition affects the relative bargaining power and whether the theoretical results obtained in previous models change as a consequence of the extension along these lines.

#### 3.1. A simple model

This section proceeds with a benchmark case: we consider a simple model in which the market setting is characterized by a food manufacturer selling to  $N$  retailers. In this case, the relative bargaining power depends only on the number of retailers. We then examine the consequences of including vertical competition.

Consider a two-stage complete information game. In the first stage the manufacturer bargains with the individual retailers about the transfer or wholesale price ( $w$ ). In the second stage, the retailers play a standard Cournot(Nash in quantities) game to determine each individual's retailer's sales volume and the market price.

We have a single manufacturer,  $M$ , supplying a homogeneous good to  $N$  symmetric retailers,  $R_1, \dots, R_N$ , indexed by  $i, j = 1, \dots, N, i \neq j$ .

The manufacturer operates under constant returns to scale, incurring a unit cost  $c_s$ , which in order to keep matters simple and without loss of generality, is set to zero. Each retailer purchases the quantity demanded by consumers from the supplier at a predetermined negotiated unit wholesale transfer price,  $w_i$ , and resells at final (unit) price  $p_i$ . In addition to the cost of purchasing the goods, retailers incur common retailing costs at constant per unit level  $C_R$ , which is again for convenience

set to zero.

In the first stage, the manufacturer bargains with each retailer. Negotiations are conducted simultaneously. As a consequence, during bargaining the firms treat the transfer prices from other bargains as given. The negotiation process is described by the two-agent (symmetric) Nash bargaining solution (Nash, 1950). The ingredients of the bargaining game are constituted by firms profits and their disagreement payoff. In the event of disagreement between a retailer and the manufacturer. The problem from the point of view of a retailer is the following. If a retailer buy from the manufacturer at some input price  $w$ , in the second stage he will obtain an equilibrium sales volume of  $q$  and make equilibrium profits of  $\Pi = (p-w)q$  where  $p$  is the second stage equilibrium price. But if the retailer decides not to buy at the input price  $w$ , then he will not sell the product and his profits will be equal to zero. Since each retailer has only a single supplier to negotiate with and no other trading options, the disagreement payoff is zero. From the point of view of the manufacturer, the disagreement payoff is determined by the profit that it can make by selling only to the other  $N-1$  retailers. In the case in which the manufacturer can sell to all the retailers, the manufacturer's profits will be equal to  $wNq$ . But if for any reason no agreement can be reached with any one of the retailers his profits will be equal to  $(N-1)wq$ .

We shall start with the second stage of the game. Suppose that after an agreement with the manufacturer on the transfer price  $w_i$ , each reatailer  $R_i$  sets final price to maximise his profit function  $\Pi_{R_i} = (p_i - w_i)q_i$ . With an indirect demand curve equal to  $p_i = 1 - q_i$ , given symmetry, each retailer equilibrium output is equal to

$$q = (1-w)/(N+1) \quad (1)$$

Total output is thus equal to

$$Q = N(1-w)/(N+1) \quad (2)$$

The equilibrium price that each retailer sets to consumers, as a function of the negotiated transfer price is equal to

$$p = (1+wN)/(N+1) \quad (3)$$

The profits for the retailer and the manufacturer are then respectively equal to

$$\pi_{Ri}=(1-w)^2/(N+1)^2, \quad (4)$$

$$\Pi_M = wN(1-w)/(N+1) \quad (5)$$

### *Outcomes from bargaining*

In the first stage of the game, the unit transfer price that each retailer pays the manufacturer is determined through negotiation. Since we assumed that M is a monopolist and N retailers there are N separate bargains where the outcome from bargaining between M and  $R_i$  over the transfer price  $w_i$  is given by

$$w_i^* = \arg \max_{w_i} [\Pi_M(w_i, \mathbf{w}_{-i}^*) - D_M(\mathbf{w}_{-i}^*)] [\Pi_{Ri}(w_i, \mathbf{w}_{-i}^*)], \quad (6)$$

where  $\mathbf{w}_{-i} = (w_1, w_2, \dots, w_{i-1}, w_{i+1}, \dots, w_N)$ . In the event that the manufacturer is unable to reach an agreement with  $R_i$ , then its disagreement payoff is  $D_i(\mathbf{w}_{-i}^*)$ , which represents the profit level it can obtain by only dealing with the other retailers. Since M is a monopolist,  $R_i$  has a zero disagreement payoff.

The FOC for (6) is

$$\delta \Pi_M(w_i, \mathbf{w}_{-i}^*) / \delta w_i [\Pi_{Ri}(w_i, \mathbf{w}_{-i}^*) + [\Pi_M(w_i, \mathbf{w}_{-i}^*) - D_M(\mathbf{w}_{-i}^*)]] \delta \Pi_{Ri}(w_i, \mathbf{w}_{-i}^*) / \delta w_i = 0. \quad (7)$$

This condition defines N functions which yield the perfect Nash equilibrium set of transfer prices  $\mathbf{w}^*$ . If disagreement should occur, then M can trade with the other retailers of this rate. With symmetry its disagreement payoff is consequently

$$D_M(\mathbf{w}_{-i}^*) = \sum_{j \neq i} w_j q_j = w(n-1)(1-w)/(N+1) \quad (8)$$

The profits for the manufacturer and  $R_i$ , in terms of the negotiated transfer prices, are then respectively



$$\Pi_M = wN(1-w)/(N+1), \quad (9)$$

$$\Pi_{Ri} = (1-w)^2/(N+1)^2 \quad (10)$$

The terms in (7) for the symmetric level are

$$\delta \Pi_M(w_i, w_{-i}^*) / \delta w_i = N(1-2w)/(N+1), \quad (11)$$

$$\delta \Pi_{Ri}(w_i, w_{-i}^*) / \delta w_i \quad (12)$$

Solving for the equilibrium agreed transfer price, we obtain

$$w^* = \frac{N}{2(N+1)} \quad (13)$$

The intermediate price given by the Nash solution is a function of the number  $N$  of retailers. The interesting issue is how  $N$  affects  $w^*$ . From (13) we have  $d w^*/dN = 1/(2N+2)^2 > 0$ . Thus, the transfer price  $w^*$  increases as the number of retailers increases.

Substituting (13) into (3) we find the equilibrium retail price:

$$p^* = \frac{I}{(n+1)} + \frac{N^2}{2(N+1)^2} \quad (14)$$

One can easily see that the final price is decreasing in  $N$ . From (14) we have  $dp^*/dN = (N-2N^2-1)/(N+1)^2 < 0$ . The final price is thus a decreasing function of the number of retailers. Thus, while the retailer's input prices decrease with  $N$ , this decrease is more than compensated by the increase in the retailers' own profit margin.

The intuition behind this result is that for the retailer to be able to extract lower prices from the manufacturer, this latter must lose an important amount of sales volume in the case of disagreement. Therefore, the retailer has a stronger bargaining power with greater concentration. But if, this is the case, then the retailer will have more market power and higher mark-ups.

### 3.2 Vertical competition and retailers bargaining power

The model presented in the previous subsection is a useful benchmark to examine the role played by vertical competition.

von Ungern-Stemberg observed that within the framework of the simple Cournot model one can obtain results compatible with the theory of countervailing power only if one is willing to assume that the retailer's degree of bargaining power increases as their number decreases. As indicated in Section 2, there are factors and mechanisms at work which just tend to increase retailer's bargaining power as concentration in retailing increases.

As the number of retailers decreases, several dimensions of competitive environment tend to change. One main change is determined by the launch of private-label products, hence the presence of vertical competition between manufacturers brands and retailer' private labels. In other terms, as concentration in retailing increases, we do not have only a decrease in  $N$  but also changes in retailers strategies with potentially relevant impact on relative bargaining power.

In order to take into account the consequences of these changes a richer theoretical framework is needed. The model presented in this sub-section extends the model discussed so far by including the impact of vertical competition. We explore the possibility that vertical competition might increase retailers' bargaining power and examine the hypothesis of countervailing power in this richer setting. If larger retailers launch their private-labels programmes, this means that at some stage retailers have and can substitute manufacturers brands with their private brands. At this point, manufactures face the risk of de-listing.

We capture the changes in relative bargaining power by examining the impact of the risk of de-listing on the manufacturer's and retailers' profits as well as on their disagreement payoff.

To see this, consider, as in subsection 3.1, a two stage model. At stage 1 we have the bargaining between one manufacturer and each one of retailers. But now elaborate the story as follows.

Our point of departure is to examine the consequences of the presence of private label products on manufacturer's profits. It should be clear that, if a part of the market is captured by private-labels, manufacturer's sales are reduced as well as his profits. For simplicity, assume that private-labels are sold at the same price of the manufacturer's brand so that we can continue to use the same demand function. Denote with  $\delta \in [0,1]$  the market share of private-label products. Now we have  $\Pi_M(\delta) = Nq(1-\delta)w$ . It is easy to see that in the previous model where  $\Pi_M = Nqw$  the absence of

private labels was an implicit assumption. Now  $\Pi_M = Nqw$  in the extreme case of  $\delta=0$ . If  $\delta=1$  then  $\Pi_M=0$ .

Under these circumstances, also  $D_M$  becomes a function of  $\delta$ . Now  $D_M=(N-1)(1-\delta)qw$ . As  $\delta \rightarrow 1$   $D_M \rightarrow 0$ . The manufacturer's disagreement payoff is lower in a market characterized by vertical competition. This issue can also be interpreted in terms of risk of de-listing. The parameter  $\delta$  can be seen as the probability of de-listing. Retailers can de-list manufacturer's brand and substitute it with their private-label

Finally, we examine the consequences for retailers' disagreement payoff. The possibility of selling private-label means that retailers have an outside option. In the event of a disagreement with the manufacturer,  $\Pi_{Ri}$  may be positive. We hypothesize that each retailer in the event of disagreement can substitute the manufacturer's brand with his private-labels and sell the same quantity  $q$  at the same price  $w$  (given the simplifying assumption that private-labels are sold at the same price  $w$ ). Obviously, this possibility is related and constrained to the existence of private-labels and depends on the value of  $\delta$ . Therefore, we have that  $D_{Ri}(\delta) = (p-w)q\delta$ . In the absence of the possibility of substituting manufacturer's brand with private labels (that is when the competitive environment is not characterized by vertical competition)  $\delta = 0$  and retailer  $i$  has the zero disagreement payoff of the previous model. But if  $\delta > 0$  then  $D_{Ri} > 0$ . In the extreme case of  $\delta = 1$  the retailer's disagreement payoff becomes equal to his profit.

The only term in the Nash product that does not change as a result of the presence of vertical competition is the retailers profits. Given the assumption of the same price  $w$  for manufacturer's brand and private-labels, the split of retailer's sales has no consequences for his profits which, as before, result  $\Pi_{Ri} = (p-q)w$ .

We assume as before that the negotiated transfer price  $w$  is derived by maximizing with respect to  $w$  the Nash product: Then the Nash bargaining solution is given by

$$w_i^* = \arg \max_{w_i} [\Pi_M(w_i, \mathbf{w}_{-i}^*) - D_M(\mathbf{w}_{-i}^*)] [\Pi_{Ri}(w_i, \mathbf{w}_{-i}^*) - D_{Ri}] \quad (15)$$

The FOC for (15) is

$$\delta \Pi_M(w_i, \mathbf{w}_{-i}^*) / \delta w_i [\Pi_{Ri}(w_i, \mathbf{w}_{-i}^*) - D_{Ri}] + [\Pi_M(w_i, \mathbf{w}_{-i}^*) - D_M(\mathbf{w}_{-i}^*)] \delta \Pi_{Ri}(w_i, \mathbf{w}_{-i}^*) / \delta w_i = 0 \quad (16)$$

This condition yields the perfect Nash set of transfer prices. Given the symmetry between the bargains, the profits for the manufacturer and the retailer  $i$  are now respectively

$$\Pi_M = wN(1-\delta)(1-w)/(N+1), \quad (17)$$

$$\Pi_{Ri} = (1-w)^2/(N+1)^2 \quad (18)$$

The disagreement payoffs are respectively

$$D_M = w(1-\delta)(N-1)(1-w)/(N+1), \quad (19)$$

$$D_{Ri} = \delta(1-w)^2/(N+1)^2 \quad (20)$$

The other terms in (16) are the following

$$\delta \Pi_M(w_i, w_{-i}^*) / \delta w_i = N(1-\delta)(1-2w)/(N+1), \quad (21)$$

$$\delta \Pi_{Ri}(w_i, w_{-i}^*) / \delta w_i = 2(w-1)/(N+1)^2 \quad (22)$$

Therefore the equilibrium agreed transfer price, as a function of  $\delta$ , is

$$w^* = \frac{N(1-\delta)}{2(N+1)} \quad (23)$$

We see that as in the model discussed in the previous sub-section, the manufacturer's selling price  $w^*$  continues to be an increasing function of the number of retailers  $N$ . Now we can examine the role played by the existence of vertical competition. We see that when  $\delta = 0$  we return to the previous results of (13). From (23) it is immediate to see that  $\delta w / \delta \delta = -N[N(1+\delta)+2]/$

$2[N(1+\delta)+1]^2 < 0$ . As  $\delta$  increases (and with it, the share of private-labels and the probability for the manufacturer of being delisted), the negotiated transfer price declines for any given  $N$ . In the extreme case of  $\delta = 1$  the negotiated transfer price collapses to zero, that is towards manufacturer's marginal cost .

The following proposition is straightforwardly from (23).

*Proposition 1.* An increase in the market share of private labels and an higher risk of de-listing for the manufacturer will increase the bargaining power of retailers while manufacturer's bargaining power decreases, for any given level of concentration in retailing.

We now turn to examine the final price. The equilibrium consumer price is

$$p^* = \frac{1}{(N+1)} + \frac{N^2(1-\delta)}{2(N+1)[1+N(1-\delta)]} \quad (24)$$

As before, the retail price results a decreasing function of the number of retailers. Two important observations comes from (24). First, for any given  $N$ , the equilibrium retail price  $p^*$  is lower, the greater is  $\delta$ . Clearly, this reflect the higher retailers' bargaining power associated with a more intense vertical competition.

Second, despite the positive effect of vertical competition on buying power, this is not enough to change the sign of the relationship between  $p^*$  and  $N$ . We see that  $p^*$  decreases with  $N$  for each value of the parameter. Even in the extreme case, when  $\delta = 1$  (and  $w^* = 0$ ), the relationship between  $p^*$  and  $N$  remains negative. Therefore, we can state the following proposition.

*Proposition 2.*

1. The greater bargaining power conferred to retailers by vertical competition is not enough to reverse the relationship between the final price and the number of retailers.
2. However, for any given number of retailers, the greater the bargaining power of retailers derived from vertical competition, the lower is the final price.

The main message conveyed by Proposition 2 is that the presence of private labels can provide benefits to the consumers in terms of lower prices. The intuition behind part 2 of this proposition is that  $\delta$  has only a minor impact on retailers' margin. It should be noted that the prediction of

Proposition 2 follows from the fact that in our model vertical competition has an asymmetric impact on retailers' BP and SP. It increases BP while it has only a minor impact on their SP.

## 5. Concluding remarks

The main object of this paper was to examine the modelling implications of manufacturer-retailer bargaining. In particular, we have examined the consequences of the retailers' ability to exert pressure on manufacturers under conditions of vertical competition, a form of competition quite relevant in advanced competitive environments where retailers are increasingly engaged in privatelabel programs.

The earlier literature that has analyzed the hypothesis of countervailing power through formal models based on the Nash bargaining solutions is silent on the possible existence of several sources of bargaining power. This model represent a first attempt at capturing the presence of vertical competition. We have included it in the simplest possible way by examining a model in which the presence of vertical competition affects the manufacturrer's and retailers' profits as well as respective disagreement payoffs.

We have assumed that vertical competition decreases the profit levels and the disagreement payoff of the manufacturer while increases the disagreement payoff of retailers while their profits remain unchanged. This is a rather strong assumption of our model. However, the qualitative results are the same if one assumes that retailers' profits decrease less than the increase in their disagreement payoff.

Our results show that vertical competition increases retailers' bargaining power, reduces equilibrium transfer prices and hence equilibrium retail prices for all  $N$ . This occurs because vertical competition allows retailers to have an outside option..

Though the increase in retailers' buying power ( BP effect) is not sufficient to countervail the increasing market power (SP effect) of retailers, final prices are lower when vertical competition is more intense for any given number of retailers. In this sense, the higher bargaining power associated to vertical competition plays a positive role for consumers when their interest is measured in terms of retail prices.

These results are more favourable to the hypothesis of countervailing power even if we suppose that retailers play Cournot at stage 2. The reason is that in our model the selling power due to Cournot

competition is countervailed by a stronger buying power created not only by greater concentration in retailing but also by the presence of vertical competition. This form of competition represents a further source of bargaining power for retailers in addition to the power channelled by their increasing size as their number  $N$  decreases. If more sources of bargaining power are allowed, the BP power effect is greater.

Obviously, the countervailing power hypothesis would obtain a stronger support if we assume a more intense price competition among retailers. In this regard, we pointed out that the countervailing power hypothesis, as put forward by Galbraith, should not be confused with the retailer's buying power. The Galbraith's hypothesis is based on the twofold presence of a buying power effect and a selling power effect with the former greater than the latter when competition in retailing is intense.

It should be noted that the positive effect of private labels for consumers weakens if private labels affect the degree of differentiation of retailers' services. Indeed, this is one of the determinants for their launch. However, it is not the only one. The theories of private label indicate that retailers adopt these strategies not only as non-price strategies of differentiation but also in order to improve their profits through the higher margins obtained on private label products. Thus, research about the determinants and the impact of private labels on retailers' degree of differentiation is quite relevant. Again, what is crucial for the countervailing power hypothesis is the existence of an asymmetric impact of vertical competition. The welfare implications of the theory hold if private labels affect retailers' buying power more than their selling power as a result of private labels' impact on the degree of differentiation of retailers' services.

While our model does include vertical competition, it is not able to capture the effects created by differentiation in retailers' services. Dobson and Waterson (1997) have pointed out the problems for social welfare associated with the existence of differentiation of retailers' services. They show that even in the case of Bertrand competition, greater concentration in retailing has negative effects for social welfare when retailers sell differentiated services.

Dobson and Waterson claim that we cannot be assured that the effects of retail concentration are benign. As a consequence, concentration in retailing should become a major concern for competition authorities. This may be the case. However, more theoretical research is needed in order to explore appropriately the sources of bargaining power. It is also worth pointing out that what is central to an appreciation of the welfare consequences of the countervailing power hypothesis is the intensity and the nature of competition in retailing. So, we also need more

empirical research on what happens in retailing as concentration increase.

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