ANÁLISE ECONÓMICA • 51

MANEL ANTELO
Universidade de Santiago de Compostela, IDEGA

LLUIS BRU
Universitat de les Illes Balears

LARGE BUYERS, PREFERENTIAL TREATMENT AND CARTEL STABILITY

ENTIDADES COLABORADORAS

- Consello Económico e Social de Galicia
- Fundación Feiraco
- Fundación Novacaixagalicia-Claudio San Martín

Edita: Servicio de Publicacións da Universidade de Santiago de Compostela
ISSN: 1138-0713
D.L.G.: C-1842-2007

Large buyers, preferential treatment and cartel stability*

Manel Antelo[a,§] and Lluís Bru[b]

ABSTRACT

Bilateral deals for large clients or key account management (henceforth KAM) is traditionally justified in terms of the importance of a long-term association between a firm and such clients. However, in this paper we offer a different rationale for a seller to apply KAM to its large buyers. When facing large buyers, a firm can use KAM to deal with such buyers –but not to small individual buyers– in order to segment the market, charge higher prices to non-KAM buyers, and increase its profits. Paradoxically, the implementation of KAM by the seller makes it advantageous for customers to belong to a buyer group, thereby eliminating the instability that would otherwise plague the creation of the group. The formation of a buyer group thus ultimately depends on the pressure it puts upon the seller to resort to KAM to segment the market.

Key words**:** Buyer group, key account management, cartel stability

JEL Classification**:** L20, L21

---

* We should like to thank Aleix Calveras, Dani Cardona, Jan Coleman, and participants at the 20th International Conference on Industrial Organization in Granada (Spain) for helpful comments and suggestions to previous versions of the paper. This work had support from the Spanish Ministry of Education and Science (grant ECO2010-21393-C04-02).

[a] Departamento de Fundamentos da Análise Económica, Universidade de Santiago de Compostela, Campus Norte, 15782 Santiago de Compostela, Spain (e-mail: manel.antelo@usc.es).

[b] Departament d'Economia de l'Empresa, Universitat de les Illes Baleares, Campus Cra. de Valldemossa, km. 7, 07122 Palma de Mallorca, Spain (e-mail: lluis.bru@uib.es).

§Corresponding Author.

1. INTRODUCTION

In many economic sectors there is a tendency for smaller customer firms to associate in purchasing groups in order to achieve greater bargaining power vis-a-vis suppliers. Examples of this practice include the horizontal integration of cable television operators for acquisition of program services (Chipty and Snyder, 1999), and of small drugstores and hospitals for purchase of pharmaceutical products (Ellison and Snyder, 2001).

Suppliers tend to assign strategic importance to the accounts of large customers. Compared to accounts of smaller clients, these strategic accounts are dealt with in a more personalized, bilateral fashion. In the jargon of the marketing literature, sellers develop key account management (KAM) programs with top sales executives, by creating a separate sales force or even a separate corporate division (Johnston and Marshall, 2003, pp. 110-112). Such special measures, which increase the costs and organizational complexity of firms, are common and are traditionally justified in terms of the importance of personalized treatment for the development and retention of major customers in the face of competition.[1]

This paper explains why large customers may get preferential treatment, beyond the obvious importance of maintaining a long-term association with these clients. In particular, there are two incentives for the seller to develop KAM when a buyer group exists. First, by grouping together, a collection of buyers can exercise monopsony power in the anonymous market, benefiting the customers within the buyer group but benefiting buyers outside the group even more. Thus, by segmenting the market and dealing with large, strategic buyers separately, i.e. through KAM, the seller may limit the impact of such buyers on prices. In other words, KAM allows the seller to eliminate the impact of the buyer group in the marketplace due to the price manipulation caused by its monopsonistic behavior. Second, the fact that a buyer group restricts its demand in the anonymous market leads the seller to implement a KAM program to achieve a more efficient relationship with the buyer group itself.

In addition to these incentives, this paper shows that the expectation of customers that, by grouping together, they will acquire an advantage (over independent customers) through KAM[2] may serve to stabilize the buyer group itself. Indeed, the main message

[1] See, for instance, Capon (2001) and Johnston and Marshall (2003).

[2] Indeed, the buyer group members obtain larger profits than non-members, and greater profits than buyer group members would obtain in the absence of KAM.

of this article is that the emergence of buyer groups and KAM implementation are closely interrelated decisions, not just in the more obvious way of sellers creating KAM in response to the presence of a buyer group, but also in the opposite way –that a buyer group emerges and survives because prospective participants anticipate being treated differently than small customers. In contrast with the merger instability traditionally observed in oligopolies (where non-members of a cartel profit more from its existence than members do),[3] the presence of KAM makes it advantageous for customers to participate in a buyer group and then solves the free rider problem that otherwise would plague the group formation in an oligopoly. In sum, the formation of a buyer group is encouraged by the expectation of the application of a KAM program, and vice versa.

To examine this issue, an industry with an upstream monopolistic supplier that sells to downstream homogeneous consumers is modeled. The seller has a minimal marketing structure consisting of a supply function rule that relates the quantity of product sold to the price that emerges in the interaction with buyers. This supply function mechanism is interpreted as a reduced form of decision rules when they cannot be made fully contingent on the information available at any given moment.[4] The supply function mechanism may represent, for instance, the decision rule that top management imposes on lower-level managers. A posted price is not optimal when demand is uncertain and cannot be responded to with an instantaneous adjustment of prices (Klemperer and Meyer, 1989), as is realistic to expect in a firm with different layers of sales management, where top managers must transmit rules of behavior useful under different contingencies and cannot obtain immediate feedback about the actual state of demand.[5] Symmetrically, throughout the paper it is assumed that buyers submit demand functions that maximize their utility. Individual buyers are small and consider that their impact on prices is negligible, so they behave as price takers. A buyer group, however, takes into account the impact of its demand on market prices and acts strategically.

In addition to a supply function pricing mechanism, the seller, with no cost, may offer bilateral contracts to (some) buyers that specify the price of the good supplied to them. This possibility is interpreted as 'bargaining' selling, i.e. as the creation of a special

[3] If the only selling procedure is a supply function rule (but not a KAM program), the strategic interaction between buyers in our model is similar to that of firms facing an oligopoly model. Salant et al. (1983) were the first to note that, in a Cournot oligopolistic setting, a cartel is not profitable unless a large number of firms enters into it; moreover, outsiders obtain larger profits than members of the cartel, and hence the cartel may be unstable. A body of literature initiated by Bloch (1996) has analyzed in detail the severity of the stability problem in the process of cartel formation (see Bloch, 2005, for a nice survey on this topic).

[4] This is indeed the main justification for the use of supply functions that is given in Klemperer and Meyer (1989).

[5] See also Basu (1993, p. 142).

sales force that is not obliged to follow the general pricing decision rule, but instead has the discretion to contact large customers –the buyer group– and establish bilateral contracts with them.

The impact of bilateral deals and contracts on market competition has long been debated by industrial economists. For potential entrants, for instance, it has been argued that contracts between incumbents and buyers can constitute an entry barrier (Innes and Sexton, 1994; Segal and Whinston, 2000). The results of this paper suggest that even in the absence of potential entrants, bilateral contracts are, depending on the circumstances, to be borne in mind by both the seller and (some of) the buyers.

More generally, this paper adds to the literature on the relative merits of different sales modalities under various circumstances. Of particular relevance to the present work are a number of studies showing: that when demand is uncertain, competing sellers are better off if they announce supply functions than if they post prices or quantities (Klemperer and Meyer, 1989); that when information is asymmetric and buyers are heterogeneous, an auction is more profitable for the seller than a posted price (Wang, 1993); and that with asymmetric information, bilateral bargaining is also preferable to posted-price selling in a dynamic context (Wang, 1995). The notion that bidders may shade their demand in uniform price auctions originates in Vickrey (1961). Finally, Ausubel and Cramton (2002) compare the equilibrium of a uniform price auction with that of a discriminatory auction in the presence of a large buyer.

The remainder of the paper is organized as follows. Section 2 describes the model of industry structure and interactions that will be used; in particular, an industry consisting of a single producer that sells a homogeneous good to buyers of equal size. Section 3 analyzes the industry performance when all buyers independently purchase the good and submit demand functions, whereas the seller, simultaneously, submits a supply schedule. In Section 4, some customers group together and announce an aggregate demand function; the seller, in turn, continues to submit a supply function rule. In Section 5, the firm, in addition to a supply function to serve independent buyers (non-KAM clients), can apply a personalized treatment to the customers within the buyer group (KAM customers); the incentives to form such a buyer group in this context are then examined. Section 6 concludes the paper.

2. THE MODEL

Consider an industry comprised of a monopolist selling a homogeneous good to a mass of n intrinsically equal buyers. Some of these customers may be associated in a buyer group and the remaining buyers purchase on an independently basis. If some customers are so associated in a buyer group, then the monopolist is aware of this, and of the size k of the group, $0 \leq k \leq n$.[6] The fraction of buyers in the group, k/n, can then vary from 0 (pure monopoly) to 1 (a monopolist selling to a monopsonist). Bearing in mind the expected demand function,[7] the monopolist's strategy is, until Section 5, to set a linear supply function $S(p) = \theta \cdot p$, where p stands for the price of the good and parameter θ, $\theta > 0$, denotes the slope of the function that the monopolist chooses strategically. In Section 5, alternatively, the firm segments the market and, in addition to a linear supply function for some buyers (non-KAM customers), it offers a personalized treatment to the buyer group (KAM buyers). Selling through the market in accordance with a supply function rule is assumed to involve negligible cost. For simplicity, any kind of direct and personalized selling or KAM is also assumed to involve no cost.[8]

The firm's costs of producing a quantity q of the good is given by $C(q) = \lambda q^2 / 2$, where λ is a strictly positive parameter indicating the degree of convexity of the function. In turn, the utility of each buyer is given by $u(q_i, m) = U(q_i) + m$, where q_i denotes the quantity of good consumed by buyer i, m its consumption of a numeraire, and $U(q_i) = (1 - q_i/2)q_i$ is utility over the consumption good. These buyers submit linear demand functions that maximize their utility in the context of the supply function (when relevant) and/or the existence of any direct contracts.[9]

In a static model in which both buyers and sellers have market power, equilibrium price (or prices) will depend greatly the exact structure of the model or game. One approach when a monopolist sells to a monopsonist is to use Nash bargaining, in which case the outcome is typically efficient. A related approach is to assume bilateral Nash bargaining (Stole and Zweibel, 1996), in which the seller and each buyer's bilateral trade is efficient.

---

[6] Throughout the paper, the number of buyers is treated as a continuum.

[7] As previously stated, in using a supply function to represent the seller's pricing policy, Klemperer and Meyer (1989) are followed.

[8] Though it would presumably be more realistic to assume that KAM involves a cost that may even depend on the number of buyers sold to in this way, the simpler model of a costless direct negotiation between the seller and the buyer group actually strengthens the major results.

[9] The model is restricted to linear supply and demand functions to make the analysis tractable.

Our approach related market interaction is very different. We assume that each party can announce a linear supply or demand function and that the equilibrium price is the one that clears the market. Buyers that purchase on an individual basis do not expect to have any impact on market prices, so each submits an individual demand function that maximizes its utility. In contrast, a *k*-sized buyer group will announce an aggregate demand function taking into account the impact of such demand on market price. In other words, the buyer group will strategically choose the slope of the per-member demand function. If there is a unique market clearing price, the seller will produce the output given by its supply function at this price. Finally, the seller collects the corresponding equilibrium profits, and buyers obtain the amount of product given by their demand schedule at the market-clearing price, receiving the corresponding consumer surplus.

This is an interesting approach, we believe, with the particular feature that all buyers pay the same price. Large buyers still have power, but when they influence the price paid they do so for all buyers.

3. PRICING BY SUPPLY FUNCTION WHEN ALL BUYERS PURCHASE INDEPENDENTLY

In the case in which all buyers purchase the good on an independent basis, the seller simply behaves as a monopoly except that it does not choose a quantity or a price, but a supply function rule. The absence of strategic behavior also means that the demand ordered by each buyer i is that which maximizes its utility $u(q_i, m)$. Such demand is $D_i(p) = 1 - p$, thereby the market demand the monopolist faces at any price p amounts to $D(p) \equiv n \cdot D_i(p) = n \cdot (1 - p)$. It then seeks to solve the problem

$$\max_p D(p) \cdot p - C(D(p)) \tag{1}$$

and the optimal price is that which satisfies the first-order condition

$$\frac{\partial D(p)}{\partial p} p + D(p) - \frac{\partial C(\cdot)}{\partial D(p)} \frac{\partial D(p)}{\partial p} = 0\,, \tag{2}$$

which particularizes in

$$\frac{\partial D(p)}{\partial p}p + D(p) - \lambda \cdot D(p)\frac{\partial D(p)}{\partial p} = 0\,, \qquad (3)$$

for the specific cost function considered. The supply function $S(p)$ chosen by the monopolist is that which equals demand submitted by buyers at the optimal price. Taking into account the first-order condition (3), condition $S(p) = D(p)$ yields

$$S(p) = -\frac{\dfrac{\partial D(p)}{\partial p}}{1-\lambda\dfrac{\partial D(p)}{\partial p}}p\,. \qquad (4)$$

Hence, the optimal linear supply function for the seller has slope $\theta^{\mathrm{m}} = n/(1+\lambda n)$, where superscript m stands for a monopoly regime. The quantity and the rest of the equilibrium values are directly obtained. Formally,

Lemma 1. *When the buyers purchase independently, then:*

(i) *Each buyer i purchases the quantity* $q_i^{\mathrm{m}} = \dfrac{1}{2+\lambda n}$ *at price* $p^{\mathrm{m}} = \dfrac{1+\lambda n}{2+\lambda n}$.

(ii) *The consumer surplus of each buyer is* $CS_i^{\mathrm{m}} = \dfrac{1}{2(2+\lambda n)^2}$.

(iii) *The profit of the monopolist amounts to* $\Pi^{\mathrm{m}} = \dfrac{n}{2(2+\lambda n)}$.

The equilibrium described in Lemma 1 will be adopted as a benchmark for subsequent sections when large, strategic buyers arise and the price of the good is determined by the interaction of the supply and demand functions submitted by the seller and customers, respectively (as in Section 4), or by a mixture of a supply-demand functions mechanism and KAM program (as in Section 5).

4. THE PRESENCE OF A BUYER GROUP

Now consider the situation in which k customers, $0 \le k \le n$, form a buyer group to purchase the good while the remaining $n-k$ customers buy independently. In this case, the equilibrium price will be determined by the market clearing condition

$$D_{BG}(p) + (n-k)\cdot D_i(p) = S(p), \tag{5}$$

where $D_{BG}(p)$, $D_{BG}(p) = k\cdot\alpha(1-p)$, is the aggregate demand function ordered by the buyer group, where subscript BG stands for a buyer group, $D_i(p)$ is the demand function submitted by each independent customer, and $S(p)$ is the supply function the monopolist submits. That is, when a buyer group exists, it strategically chooses the slope α, $\alpha > 0$, of the per-member demand function. In this choice, the incentive of the buyer group to withdraw demand of the market will be reflected in the fact that $\alpha < 1$.
When some buyers purchase on an individual basis but others form a buyer group, the buyer group takes into account the market-wide impact of its aggregate demand. The seller, in turn, when deciding on the amount of production to ship to the market, anticipates the monopsonistic behavior of the buyer group and presumably adapts its supply function rule to such an environment.
The residual supply that the buyer group faces at any price p is given by $RS(p) = S(p) - (n-k)\cdot D_i(p)$, from which the buyer group seeks to maximize the consumer surplus of its members by choosing a point on the residual supply,

$$\max_p \left(1 - \frac{RS(p)}{2k}\right)\cdot RS(p) - p\cdot RS(p), \tag{6}$$

and the optimal price is the one that solves the first-order condition

$$\frac{\partial RS(p)}{\partial p} - \frac{1}{k} RS(p)\frac{\partial RS(p)}{\partial p} - p\frac{\partial RS(p)}{\partial p} - RS(p) = 0\,. \tag{7}$$

The demand chosen by the group must equal the residual supply at the optimal price, $D_{BG}(p) = RS(p)$, i.e.

$$D_{BG}(p) = k \frac{\frac{\partial RS(p)}{\partial p}}{k + \frac{\partial RS(p)}{\partial p}} (1-p)\,. \tag{8}$$

If the monopolist is expected to follow the supply function $S(p) = \theta \cdot p$ and the demand of independent buyers is $D_i(p) = 1 - p$, the best response of the buyer group as a whole is to set an aggregate demand function $D_{BG}(p) = k \cdot \alpha(1-p)$ for which the slope α of the per-member demand function is

$$\alpha_{BG} = \Psi_{BG}(\theta) = 1 - \frac{k}{\theta + n}\,. \tag{9}$$

It can be noted from (9) that the buyer group internalizes the effect of its demand on the price, i.e. $0 < \alpha_{BG} = \Psi_{BG}(\theta) < 1$. As a consequence, its members always order less quantity than non-members for a given market price. In other words, non-members are free riders on the buyer group and thus they obtain a larger consumer surplus than customers within the buyer group.

The demand now faced by the monopolist at any price p is given by

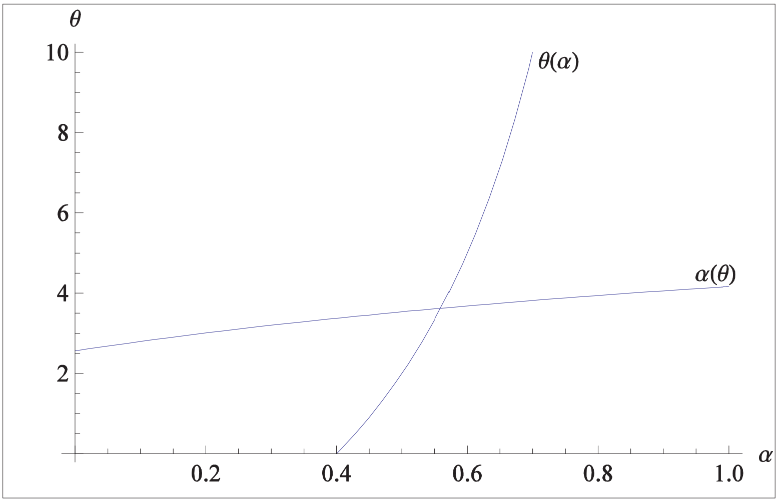
$$D(p) = D_{BG}(p) + (n-k) \cdot D_i(p) = (n - k + k\alpha) \cdot (1-p) \tag{10}$$

and, in order to choose the optimal linear supply function, it seeks to maximize its profits by selecting a point on the residual demand and setting a supply function which equals demand at the optimal price, as in (4). The corresponding optimal linear supply function has slope

$$\theta_S = \Psi_S(\alpha) = \frac{n - k + k\alpha}{1 + \lambda \cdot (n - k + k\alpha)}\,, \tag{11}$$

where subscript S indicates the presence of a buyer group. From (9) and (11) it is evident that $\Psi'_{BG}(\theta) > 0$ and $\Psi'_{S}(\alpha) > 0$, i.e. both actions, the buyer group's behavior in choosing α_{BG} and the seller's behavior of setting θ_S, are strategic complements as illustrated in Figure 1.

Figure 1. Reaction functions of the seller, $\theta(\alpha)$, and the buyer group, $\alpha(\theta)$. (Parameter values: z =1.4 (or n = 1.4/λ), k = 0.6 n)



The solution of (9) and (11) affords the following proposition.

Proposition 1. *If a buyer group exists, then:*

(i) *In the unique equilibrium that holds the monopolist's behavior is given by* $\theta_S^* = \dfrac{2\sqrt{(n-k)(n+k)}}{\lambda\sqrt{(n-k)(n+k)} + \sqrt{(2+\lambda n+\lambda k)(2+\lambda n-\lambda k)}}$, *and the buyer group's behavior by* $\alpha_{BG}^* = \dfrac{2k(1+\lambda n)}{2k(1+\lambda n)+A}$, *where* $A = 2(n-k) + \lambda(n-k)^2 + \sqrt{(n-k)(n+k)[(2+\lambda n)^2 - k^2\lambda^2]}$, A>0.

(ii) *The larger the buyer group, the flatter the demand function it submits and the flatter the supply function.*

Proof. See Appendix.

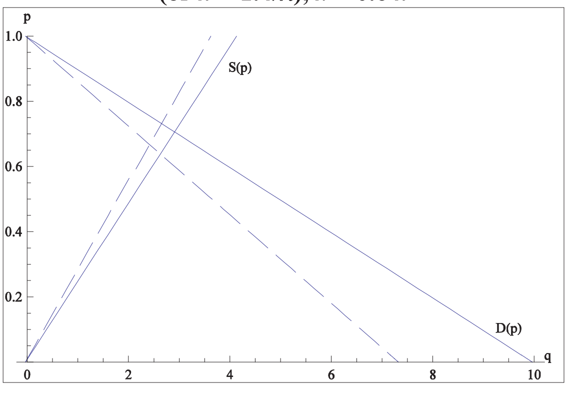
As compared with Lemma 1, part (i) of Proposition 1 shows that the buyer group withdraws demand from the market, $\alpha^*_{BG} < 1$, and the monopolist reacts to the presence of a buyer group with a flatter supply function than when all customers act individually, $\theta^*_S < \theta^{\mathrm{m}}$. The intuition of this result relies on the fact that the existence of a buyer group reduces aggregate demand, which leads the seller to react by increasing the price sensitivity to any increase in supply. Part (ii) indicates that both such behaviors are exacerbated as the buyer group grows.

Given the equilibrium behavior stated in Lemma 1 and Proposition 1, it is immediate to conclude that the equilibrium quantity decreases in *k*, but it is not evident what happens to the equilibrium market price. Some algebraic manipulation, however, shows that

$$p^* = \frac{1}{2}\left(1 + \frac{\lambda\sqrt{(n-k)(n+k)}}{\sqrt{(2+\lambda n+\lambda k)(2+\lambda n-\lambda k)}}\right), \tag{12}$$

from which it follows that $p^* < p^{\mathrm{m}}$ and $\partial p^* / \partial k < 0$. Hence, the equilibrium market price is lower whenever there is a buyer group, and by as much as the buyer group's growth. Figure 2 below illustrates the market equilibrium in the absence and in the presence of a buyer group by depicting aggregate demand and supply functions when all buyers purchase independently (continuous lines) and when there is a buyer group with outsiders acting individually (dashed lines).

Figure 2. Market equilibrium when all buyers act independently (continuous line) and when there is a buyer group (dashed line). Parameter values: *z*=1.4 (or *n* = 1.4/*λ*), *k* = 0.6 *n*



Now the consumer surplus of members and non-members of the buyer group may be compared. From their respective consumptions in equilibrium, $q^*_{BG} = \alpha^*(1-p^*)$ and $q_i^{\mathrm{m}} = 1-p^*$, the surplus they obtain, $CS(q,p) = (1-q/2)q - pq$, is

$$CS_{BG} = (2-\alpha^*)\alpha^* \frac{(1-p^*)^2}{2}, \tag{13}$$

for the buyer group, and

$$CS_i = \frac{(1-p^*)^2}{2}, \tag{14}$$

for each individual customer. From (13) and (14), it follows that customers outside the buyer group are better off than those within it whenever $\alpha^*_{BG} \neq 1$ and, in particular, whenever there is a buyer group withdrawing demand from the market.

In order to examine the impact of the size of the buyer group on the consumer surplus of its members, CS_{BG}, the consumer surplus of non-members, CS_i, and the monopolist's profits, Π_S, it is useful to define $\lambda{\cdot}n$ as parameter *z*, and k/n, the relative size of the buyer group, as parameter *s*.

Lemma 2. *Given parameter z, if a buyer group of relative size s exists, then, in equilibrium, the consumer surplus of the buyer group members,* CS_{BG}*, that of individual customers,* CS_i*, and the profit of the monopolist,* Π_S*, are, respectively, as follows:*

$$CS_{BG}(s) = \frac{1}{(z+2)^2 - z^2s^2 + (z+2-zs^2)\sqrt{[((z+2)^2 - z^2s^2)/(1-s^2)]}},$$

$$CS_i(s) = \frac{1}{2}\left(\frac{z+2+zs^2+\sqrt{(1-s^2)[(z+2)^2-z^2s^2]}}{(z+2)^2 - z^2s^2 + (z+2)\sqrt{(1-s^2)[(z+2)^2-z^2s^2]}}\right)^2, \quad \text{and}$$

$$\Pi_S(s) = \frac{n}{2}\sqrt{\frac{1-s^2}{(z+2)^2 - z^2s^2}}.$$

Proof. See Appendix.

This lemma allows analysis of how the consumer surplus of customers within the buyer group evolves with the relative size of the group. It is not difficult to see that it may increase as the buyer group grows, as long as the buyer group is large enough. That is, the buyer group members benefit from a steeper supply function of the seller and from a lower number of independent buyers, since this leads to fewer free riders in the market. Finally, the monopolist's profit always falls as s increases, and is therefore always less than in the absence of a buyer group, $\Pi_S < \Pi^{\mathrm{m}}$. In sum,

Proposition 2. *When a buyer group of relative size s exists and the remaining customers buy independently, the following holds:*

1. *If $z \leq 1$ (i.e. $\lambda \leq 1/n$), members of the buyer group are worse off than in the absence of the group, $CS_{BG}(s) < CS_i^{\mathrm{m}}$, for any s.*
2. *If $z > 1$ (i.e. $\lambda > 1/n$), then:*
   - (i) *There is a cut-off value $\bar{s}$ of the buyer group's relative size, $\bar{s} < 1$, for which members of a buyer group are better off than in the absence of the buyer group, $CS_{BG}(s) > CS_i^{\mathrm{m}}$, if $0 < s < \bar{s}$. For $s > \bar{s}$, however, the buyer group members are worse off than in the absence of the buyer group, $CS_{BG}(s) < CS_i^{\mathrm{m}}$.*
   - (ii) *The buyer group members are always worse off than non-members, $CS_{BG}(s) < CS_i(s)$.*
   - (iii) *The seller's profit is always less in the presence of a buyer group than in its absence, $\Pi_S(s) < \Pi^{\mathrm{m}}$, and decreases as the buyer group grows, $\partial \Pi_S(s)/\partial s < 0$.*

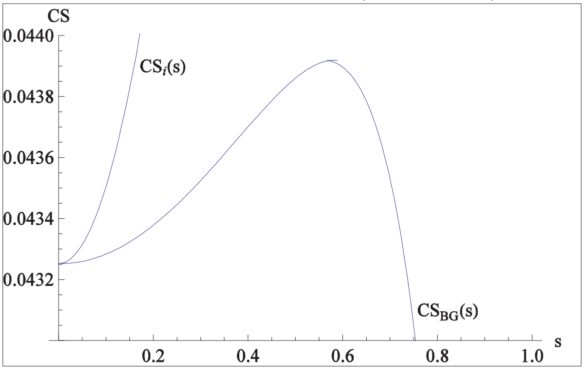
Proof. By checking expressions of Lemma 2. ■

Part 1 of the proposition states that for a given market size, a buyer group is prejudicial for its members as long as the cost function of the seller is sufficiently convex. Hence, a buyer group would never arise in these circumstances. For a high degree of convexity of the seller's cost function, statements (i) and (ii) of Part 2 extend to a vertically structured industry the main results of the literature on collusion and cartels that followed Salant et al. (1983)'s analysis of free riders in relation to mergers among oligopolistic firms.[10] Finally, Part 2(iii) of the proposition is the consequence of the seller's control of its supply function being insufficient to offset the reduction of its profit caused by reduced demand and price. Figure 3 depicts as $CS_{BG}(s)$ and $CS_i(s)$

[10] An excellent guide to this literature is provided by Bloch (2005).

evolve with the relative size of the buyer group for a value of parameter *s* for which the formation of the buyer group may increase both surpluses with respect to the competitive scenario.

Figure 3. Consumer surplus of members of the buyer group, $CS_{BG}(s)$, and non-members, $CS_i(s)$, as function of the relative size s of the buyer group. Parameter values: z=1.4 (or n = 1.4/λ)



Which size of the buyer group maximizes the per-capita consumer surplus of its members? For a given market size, the degree of convexity of the seller's cost function is crucial in answering this question, as the following proposition states.

Proposition 3. *Regarding the optimal relative size* s^* *of the buyer group with respect to the degree of convexity z of the seller's cost function:*

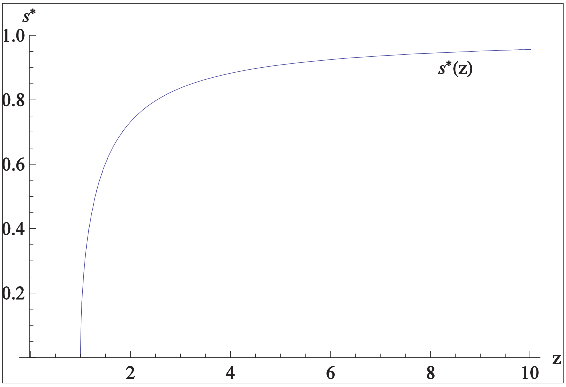
(i) *It is given by* $s^* = \begin{cases} 0, & if\ z \le 1 \\ \left[\dfrac{z^2 + z + 2 - 2\sqrt{2z(1+z)}}{z(z-1)} \right]^{1/2}, & if\ z > 1 \end{cases}$

(ii) *Whenever* $z > 1$, s^* *is increasing in z.*

Proof. (i) By maximizing $CS_{BG}(s)$ of Lemma 2; (ii) By inspection of derivative of s^* w.r.t. parameter *z* it follows that $\partial s^* / \partial z > 0$. ■

The intuition of the proposition is quite simple. For a sufficiently low convexity of the monopolist's cost function such as $\lambda \le 1/n$ (or $z \le 1$), customers within the group are worse off than if acting independently, so a buyer group is not expected to arise in these circumstances. To the contrary, if there is a sufficiently high degree of convexity of the firm's cost function, such customers may be better off (with a judiciously chosen size of the buyer group) than if purchasing separately, despite the fact that the seller reacts to the presence of a buyer group by reducing its supply. Part (ii) states that the optimal size of the buyer group increases in *s*, as the firm's cost function becomes more convex (larger λ) and/or there are more buyers in the market (*n* increases). Indeed, if $z \leq 1$ there is no buyer group better for prospective members than their acting as independent price-taking consumers, and the relative size of the buyer group goes from zero to one as λ increases as verifying condition $\lambda \cdot n > 1$. In fact, for any $z > 1$, it follows that $s^* < 1$ and approximates 1 as $z \to \infty$, that is, in no case the buyer group does not incorporate all buyers, since the seller reacts by setting a flatter supply function as the buyer group grows (see Figure 4). In other words, the market relationship between the seller and the buyer group tends to collapse when the buyer group is too large.

Figure 4. Optimal relative size of the buyer group, $s^* = k^*/n$, as a function of parameter z



However, the formation of a buyer group would not be expected in this case, since prospective participants are interested in being free riders and thus remaining independent. Further, the seller is negatively affected by the creation of a buyer group of any size as stated in Part 2 (iii) of Proposition 2.[11] As a result, it may try to eliminate the buyer group's ability to reduce the price market-wide by segmenting the market (and excluding buyer group members from the anonymous market while retaining the supply function pricing mechanism for transactions with non-member buyers). This is the possibility analyzed in the next section. Then, the intrinsic instability of the buyer group must be re-examined.

[11] Indeed, its profit collapses to zero as *x* approximates 1.

5. A SELLER THAT COMBINES A SUPPLY FUNCTION RULE AND KAM

This section discusses the development of a KAM program with the buyer group instead of using a supply function rule as in Section 4 above. To this end, KAM is modeled as a personalized linear price p_{BG} for the members of the buyer group (direct dealing or bilateral negotiation). In case of a disagreement, the seller and the buyer group maintain the market relationship previously considered in Section 4. For the sake of simplicity, it is also assumed that (i) the agreement between the seller and the buyer group is restricted to a linear payment, (ii) the seller has all the bargaining power in the negotiation, and (iii) remaining customers are served in accordance with a linear supply function. The first assumption –that the arrangement between the seller and the buyer group is restricted to linear payments– is needed to make the analysis tractable. The second assumption leads the seller to propose a linear price to the buyer group such that it guarantees its members at least the reservation value, that is, at least the consumer surplus obtained in the supply-demand functions regime, and, given that, the buyer group will accept the supplier's proposal. Regarding the last assumption, it is apparent that the implementation of KAM with independent buyers is not valuable and is even prejudicial for the seller for two reasons. First, independent buyers are price-takers in the market, and therefore a separate linear price does not solve any inefficiency. Second, the buyer group would have a larger market share in the market and hence the seller would have reduced profits from the market.

In principle, direct dealing with the members of the buyer group through KAM accrues two potential benefits for the seller. First, the relationship between the seller and the buyer group becomes more efficient, since the incentive to withdraw demand disappears and hence the members of the buyer group demand more, $q_{BG} = 1 - p_{BG}$; as a consequence, the seller may extract more rent from the buyer group's members. Second, KAM prevents the buyer group from purchasing on the open market in competition with independent buyers, and then eliminates the impact of the buyer group's market power in transactions with other buyers. Hence, the agreement runs at the expense of non-KAM buyers who face an increase in the price.

The seller thus offers a price p_{BG} to KAM buyers and chooses a point p_i on the demand function of non-KAM buyers to solve the problem

$$\max_{(p_{BG},\, p_i)} s\, p_{BG}(1-p_{BG}) + (1-s)p_i(1-p_i) - \frac{1}{2}z[s(1-p_{BG}) + (1-s)(1-p_i)]^2$$
$$\text{s.t}: \begin{cases} \frac{1}{2}(1-p_{BG})^2 \geq CS_{BG}(s) \\ 0 \leq p_i \leq 1 \end{cases} \tag{15}$$

where the first restriction is the condition for the buyer group to accept the seller's deal, and the second one is a feasibility constraint.

It is useful to analyze the case when the participation constraint of the buyer group affects the seller's maximization problem defined in (15). Given *z*, define $\hat{s}$ as the relative size of the buyer group that satisfies

$$CS_{BG}(0) = CS_{BG}(\hat{s})\,. \tag{16}$$

This condition allows us to define a buyer group of relative size $s \in [\hat{s}, 1]$, for which it follows $CS_{BG}(0) > CS_{BG}(s)$. That is, for a buyer group with a relative size larger than $\hat{s}$ and that operates in an anonymous market, its members are worse off than when all buyers act on an individual basis. This can be restated as

Lemma 3. *A cut-off value of the relative size of the buyer group exists, $\hat{s}$, such that:*

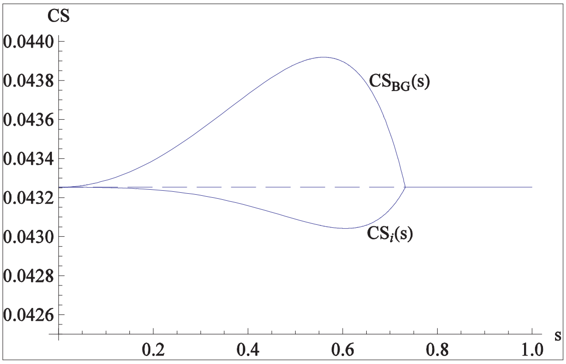
(i) *If $s \in (0, \hat{s})$, prices paid by KAM and non-KAM buyers are such that $p_{BG} < p^{\mathrm{m}} < p_i$. Thus, $CS_{BG} > CS_i^{\mathrm{m}} > CS_i$.*

(ii) *If $s \in [\hat{s}, 1)$, all buyers pay the same (monopoly) price, $p_{BG} = p_i = p^{\mathrm{m}}$, and obtain the same consumer surplus as in the standard monopoly, $CS_{BG} = CS_i = CS_i^{\mathrm{m}}$.*

Proof. See Appendix.

The more striking result of Lemma 3 is that offered in part (i): for smalls buyer groups (those with relative size smaller than $\hat{s}$), application of KAM leads the monopolist to squeeze out non-KAM buyers. Figure 5 below shows how membership in the buyer group affects the consumer surplus attained with KAM for different values of the relative size of the buyer group. Given the market size, as the buyer group grows, the seller is forced to offer lower prices to the buyer group, up to the point at which the group reaches a relative size $\hat{s}$. As lower prices are offered to the buyer group (and hence its members increase their consumption level), the seller must restrict its supply to independent buyers in order to contain the increase in production costs.[12]

Figure 5. Consumer surplus of KAM buyers, $CS_{BG}(s)$, and non-KAM buyers, $CS_i(s)$, as function of the relative size *s* of the group. Parameter values: z=1.4 (or $n = 1.4/\lambda$)



However, for sufficiently large buyer groups (those with a relative size larger than $\hat{x}$), the monopolist may offer higher prices to their members, since reservation value is also decreasing in *s*. As a consequence, the seller may offer a larger supply to independent buyers setting a lower price p_i. When the buyer group reaches a relative size equal to or larger than $\hat{s}$, its outside option is below CS_i^{m}, the participation constraint is no longer binding, and application of KAM leads to the same price level as in a market with price-taking consumers.

5.1 The stability of the buyer group revisited

In Section 4, it was shown that buyer groups are unstable in the absence of KAM policy. Indeed, the formation of a buyer group is beneficial for its members only if it is large enough, and in any case it is unstable, since non-members profit more from its

[12] For some parameter values, independent customers are not even served at all. Specifically, it can be seen that, for parameter values λ and n verifying the condition $\lambda \cdot n \geq 7$, the monopolist sets the price $p_i = 1$ whenever the relative size *s* of the buyer group is in the interval $(\bar{s}, \tilde{s})$, where $\bar{s}$ is the cut-off value defined in Proposition 2 and $\tilde{s} < \hat{s}$.

existence than members do −a result which parallels that of Salant et al. (1983). In Section 5, however, we have shown that if a buyer group that purchases through KAM is formed, customers outside the group may be squeezed out. Hence, it can be argued that if prospective members of the group anticipate separate treatment of KAM and non-KAM buyers, then customers may have a strong incentive to join the group.

Thus, consider that some buyers form a buyer group whenever they expect to be better off than they would be if acting independently, and that membership to the buyer group may be limited whenever further entry in the buyer group decreases the per-capita consumer surplus of its members. The following result holds.

Proposition 4. *If the monopolist develops KAM, a buyer group of relative size s^* is created, where s^* is defined by Proposition 3.*

A buyer group would not emerge if its members did not expect, in response, separate and personalized treatment from the seller. This separate treatment then solves the free rider problem that would otherwise plague the creation of buyer groups, and stabilizes the buyer group by making members' consumer surplus greater than that of non-members (and no less than that obtained by members in the absence of KAM). Further, although it is, ex-post, in the seller's interest to develop KAM to serve the buyer group, it never allows the seller to achieve profits as large as when it applies a supply function in the absence of the group. Hence, no such buyer group will emerge if the seller can commit to never resorting to KAM and can deal instead with all customers on an equal footing in the anonymous market. The formation of a buyer group thus depends both on its increasing buyers surplus and on the pressure it puts upon the seller to resort to KAM.

6. CONCLUDING REMARKS

Traditional wisdom has it that sellers apply key account management (KAM) because of the importance of courting large clients by offering them better terms. In this article, we offer an additional rationale for KAM. For a model in which buyers decide whether to purchase a good separately or by grouping together, and the monopolist chooses whether to sell on an open market by a supply function or by direct negotiation, the optimal selling format depends on how buyers are organized and vice versa. More specifically, when facing a buyer group instead of individual clients, the monopolist faces both reduced demand and reduced profit when group members are charged the same price as non-members. Then it is in the monopolist's interest to deal with the group by direct negotiation rather than through a supply function pricing mechanism, and to serve any independent buyers in accordance with a supply function. This market segmentation between KAM and non-KAM buyers allows the monopolist to limit the impact of the buyer group's market power on transactions with other buyers. By preventing the buyer group's members from purchasing on the open market in competition with independent buyers, the monopolist is able to exploit non-members more efficiently. Put another way, bilateral bargaining with the buyer group enables the seller to partially make up for the negative effect of the group on its profits by increasing the income obtained from independent buyers. As a result, the consumer surplus of the independent buyers is less than it would be without a buyer group, and it is also less than that of customers within the group, which means that joining the group is advantageous to buyers. Thus a buyer group, though in principle unstable because of the threat of free riders, is encouraged by the potential to acquire stability by forcing the application of KAM. The seller is better off without any buyer group—when all buyers are approached with a supply function. If the seller could commit to never resorting to KAM, then the buyer group would never emerge. Its formation thus depends both on its increasing buyers' surplus and on the pressure it puts upon the seller to resort to KAM.

In this paper, the analysis has been restricted to the incentives to form just one buyer group, and the group that emerges is not a grand coalition that includes all the buyers in the market. An interesting question for future research is whether other coalitions of buyers could emerge, and more generally, which could be the final, endogenous organization of customers when more than one coalition or buyer group is allowed.

Of significant interest for future research is also the question of what happens when the buyers are retailers rather than end consumers. Our findings suggest that in this three-tiered situation, independent retailers would pay higher wholesale prices than retailers associated in some form of buyer group, and would accordingly sell the product to their clients at higher retail prices. The apparent inefficiency of independent retailers in comparison with the retail group would be the result of economies of scale in purchasing, not in production, and the apparent inefficiency of small retailers would be an automatic consequence of the formation of the retail group. In the absence of retail groups and the consequent implementation of market segmentation by the seller, individual retailers would undoubtedly pay lower wholesale prices.

APPENDIX

Proof of Proposition 1. (i) The fact that $\Psi_{BG}(0)=1-k/n$ is strictly positive whenever $k<1$ leads any equilibrium to require the fulfillment of the condition $\alpha>1-k/n>0$. Consider the two functions $\theta=\Psi_{BG}^{-1}(\alpha)$ and $\theta\geq 0$. Any equilibrium is a value for □ in the interval $[1-k/n,\,1]$ for which $\Psi_S(\alpha)=\Psi_{BG}^{-1}(\alpha)$. First notice that at the corner, i.e., whenever $\alpha=1-k/n$, it holds that $\Psi_S(1-k/n)>\Psi_{BG}^{-1}(1-k/n)$. On the other hand, for α=1, $\Psi_S(1)=n/(1+\lambda n)$ and $\Psi_{BG}^{-1}(1)\to\infty$. Since both functions Ψ_{BG}^{-1} and Ψ_S are continuous, they must cross somewhere in the interval $[1-k/n,\,1]$. Hence, there must be at least one equilibrium point. However, the fact that

$$\frac{\partial\Psi_S(\alpha)}{\partial\alpha}=\frac{k}{[1+\lambda(n-k+k\alpha)]^2}<\frac{k}{(1-\alpha)^2}=\frac{\partial\Psi_{BG}^{-1}(\alpha)}{\partial\alpha} \tag{A1}$$

allows to conclude that once both functions cross, they do not cross anymore. Therefore the equilibrium is unique, and it is given by the values α_{BG}^{*} and θ_S^{*} obtained from solving (9) and (11).

(ii) It immediately follows that $\dfrac{\partial\alpha_{BG}^{*}}{\partial k}<0$ and $\dfrac{\partial\theta_S^{*}}{\partial k}<0$. ■

Proof of Lemma 2. From Proposition 1, we have

$$\alpha_{BG}^{*}=1-\frac{2k(1+\lambda n)}{k^2\lambda+2n+\lambda n^2+\sqrt{(n-k)(n+k)[(2+\lambda n)^2-k^2\lambda^2]}} \tag{A2}$$

and

$$\theta_S^{*}=\frac{2\sqrt{(n-k)(n+k)}}{\lambda\sqrt{(n-k)(n+k)}+\sqrt{(2+\lambda n+\lambda k)(2+\lambda n-\lambda k)}}\,. \tag{A3}$$

On the other hand,

$$p^* = \frac{1}{2}\left(1 + \frac{\lambda\sqrt{(n-k)(n+k)}}{\sqrt{(2+\lambda n+\lambda k)(2+\lambda n-\lambda k)}}\right). \quad \text{(A4)}$$

Inserting (A2)-(A4) in Equations (13), (14), and the expression of the monopolist's profit function, $\Pi_S(s)$, the result holds. ■

Proof of Lemma 3. If $CS_{BG}(s) < CS_i^M$, the price p^{m} is that which maximizes the first-order condition of the problem given in (15) and the participation constraint is not binding, $(1-p^{\mathrm{m}})^2/2 > CS_{BG}(s)$. On the contrary, if $CS_{BG}(s) > CS_i^{\mathrm{m}}$, the participation constraint is binding, and the price p_{BG} and the price p_i that solve problem (15) are

$$p_{BG} = 1 - \sqrt{2\,CS_{BG}(s)} \quad \text{(A5)}$$

and

$$p_i = \frac{1+z-z\cdot s\cdot p_{BG}}{2+z-z\cdot s}, \quad \text{(A6)}$$

respectively. Upon further inspection, it is evident that whenever $CS_{BG}(s) > CS^{\mathrm{m}}$, $p_{BG} < p^{\mathrm{m}} < p_i$, where $p^{\mathrm{m}} = (1+z)/(2+z)$ according to Lemma 1. ■

References

Ausubel, L.M. and P. Cramton (2002), Demand reduction and inefficiency in multi-unit auctions. (Available at http://www.ausubel.com/auction-papers/demand-reduction-r.pdf).

Basu, K. (1993), *Lectures in Industrial Organization Theory*, Oxford, Blackwell.

Bloch, F. (1996), Sequential formation of coalitions in games with externalities and fixed payoff division, *Games and Economic Behavior* 14, 90-123.

Bloch, F. (2005), Group and net formation in Industrial Organization: A survey, in G. Demange and M. Wooders (eds.), *Group Formation in Economics: Networks, Clubs, and Coalitions*, Cambridge, Cambridge University Press, 335-53.

Capon, N. (2001), *Key Account Management and Planning*, New York, The Free Press.

Chipty, T. and C.M. Snyder (1999), The role of firm size in bilateral bargaining: A study of the cable television industry, *The Review of Economics and Statistics* 81, 326-40.

Ellison, S.F. and C.M. Snyder (2001), Countervailing power in wholesale pharmaceuticals, MIT Dept. of Economics Working Paper No. 01-27. (Available at http:\\econ-www.mit.edu\faculty\download_pdf.php?id=222).

Innes, R. and R.J. Sexton (1994), Strategic buyers and exclusionary contracts, *American Economic Review* 84, 566-84.

Johnston, M.W. and G.W. Marshall (2003), *Churchill/Ford/Walkers's Sales Force Management*, New York, McGraw-Hill/Irwin.

Klemperer, P.D. and M. Meyer (1989), Supply function equilibria in oligopoly under uncertainty, *Econometrica* 57, 1243-77.

Salant, S.W., Switzer, S. and R. Reynolds (1983), Losses from horizontal merger: the effects of an exogenous change in industrial structure on Cournot-Nash equilibrium, *Quarterly Journal of Economics* 98, 185-99.

Segal, I.R. and M.D. Whinston (2000), Naked exclusion: Comment, *American Economic Review* 90, 296-309.

Stole, L., and J. Zweibel (1996), Intra-firm bargaining under non-binding contracts, *Review of Economic Studies* 63, 375-410.

Vickrey, W. (1961), Counterspeculation, auctions, and competitive sealed tenders, *Journal of Finance* 16, 8-37.

Wang, R. (1993), Auctions versus posted-price selling, *American Economic Review* 83, 838-851.

Wang, R. (1995), Bargaining versus posted-price selling, *European Economic Review* 39, 1747-1764.

DOCUMENTOS DE TRABALLO XA PUBLICADOS.

ÁREA DE ANÁLISE ECONÓMICA

47. EFFECTS OF TOURISM DEVELOPMENT ON TEMPORALITY (**Yolanda Pena Boquete, Diana Pérez Dacal**)
48. THE GREAT DEPRESSION IN SPAIN **(Eduardo L. Giménez, María Montero)**
49. ALGUNAS CONSIDERACIONES ACERCA DE LOS MODELOS INPUT-OUTPUT RECTANGULARES **(Xesús Pereira López, Melchor Fernández Fernández, André Carrascal Incera)**
50. ACTUALIZACIÓN DE LA INVERSA DE LEONTIEF **(Xesús Pereira López, José Luis Quiñoá López, André Carrascal Incera)**

ÁREA DE ECONOMÍA APLICADA

20. A CALIDADE DE VIDA COMO FACTOR DE DESENVOLVEMENTO RURAL. UNHA APLICACIÓN Á COMARCA DO EUME. **(Gonzalo Rodríguez Rodríguez.)**
21. CARACTERIZACIÓN SOCIOECONÓMICA Y DESARROLLO DEL TURISMO EN LA "COSTA DA MORTE". **(Begoña Besteiro Rodríguez)**
22. OS SERVIZOS A EMPRESAS INTENSIVOS EN COÑECEMENTO NAS REXIÓNS PERIFÉRICAS: CRECEMENTO NUN CONTEXTO DE DEPENDENCIA EXTERNA? **(Manuel González López)**
23. O PAPEL DA EMPRESA PÚBLICA NA INNOVACIÓN: UNHA APROXIMACIÓN Á EXPERIENCIA ESPAÑOLA **(Carmela Sánchez Carreira)**

ÁREA DE HISTORIA

14. AS ESTATÍSTICAS PARA O ESTUDIO DA AGRICULTURA GALEGA NO PRIMEIRO TERCIO DO SÉCULO XX. ANÁLISE CRÍTICA**. (David Soto Fernández)**
15. INNOVACIÓN TECNOLÓXICA NA AGRICULTURA GALEGA **(Antom Santos, Pablo Jacobo Durán García, Antonio Miguez Macho)**
16. EL BACALAO EN TERRANOVA Y SU REFLEXIÓN DE LAS ZEE **(Rosa García-Orellán)**
17. LA ORGANIZACIÓN DEL TRABAJO EN LA GALICIA COSTERA: UNA REVISIÓN DEL IMPACTO DE LA INDUSTRIALIZACIÓN CONSERVERA EN ILLA DE AROUSA, 1889-1935 **(Daniel Vázquez Saavedra)**

ÁREA DE XEOGRAFÍA

22. A SITUACIÓN DA INDUSTRIA DA TRANSFORMACIÓN DA MADEIRA E A SÚA RELACIÓN CO SECTOR FORESTAL EN GALIZA ANTE A CHEGADA DO SÉCULO XXI **(Ángel Miramontes Carballada)**
23. LA CIUDAD Y SU IMAGEN TURÍSTICA EL CASO DE SANTIAGO DE COMPOSTELA EN EL MERCADO ITALIANO (**Lucrezia Lopez)**
24. EL DESARROLLO ECONÓMICO DE SANTA COMBA DE XALLAS. BASES PARA LA ELABORACIÓN DE UN PLAN ESTRATÉGICO MUNICIPAL (PEDEM) (**José Balsa Barreiro)**
25. LA MOVILIDAD FEMENINA EN ÁREAS RURALES. UN ESTUDIO CUALITATIVO EN LA COMARCA DEL DEZA (GALICIA) (**Xiana Rodil Fernández, José Antonio Aldrey Vázquez, Miguel Pazos Otón)**

XORNADAS DO IDEGA

5. RESIDUOS SÓLIDOS URBANOS: A SUA PROBLEMÁTICA E A SÚA GESTIÓN **(Marcos Lodeiro Pose, Rosa María Verdugo Matês)**
6. CINEMA E INMIGRACIÓN **(Cineclube Compostela, Rosa Maria Verdugo Matés, Rubén C. Lois González)**
7. NOVAS TECNOLOXÍAS E ECONOMÍA CULTURAL. II Xornadas SINDUR **(Carlos Ferrás Sexto)**
8. MODELOS DE APOYO AL ASOCIACIONISMO Y LA INNOVACIÓN EN LA GESTIÓN DE LA PEQUEÑA PROPIEDAD FORESTAL EN EL NOROESTE DE LA PENÍNSULA IBÉRICA. **(Manuel Fco. Marey Pérez)**

GEOGRAPHY YOUNG SCHOLARS BOOK

1. NEW TRENDS IN THE RENEWAL OF THE CITY **(María José Piñeira, Niamh Moore)**
2. CHANGES IN THE CITY **(María José Piñeira, Niamh Moore).**

Normas para os autores:

1. Os autores enviarán o seus traballos, por correo electrónico á dirección (idegadt@usc.es) en formato PDF ou WORD. O IDEGA poderá solicitar o documento en papel se o estima conveniente.
2. Cada texto deberá ir precedido dunha páxina que conteña o título do traballo e o nome do autor(es), as súas filiacións, dirección, números de teléfono e fax e correo electrónico. Así mesmo farase constar o autor de contacto no caso de varios autores. Os agradecementos e mencións a axudas financeiras incluiranse nesta páxina. En páxina á parte incluirase un breve resumo do traballo na lingua na que estea escrito o traballo e outro en inglés dun máximo de 200 palabras, así como as palabras clave e a clasificación JEL.
3. A lista de referencias bibliográficas debe incluír soamente publicacións citadas no texto. As referencias irán ó final do artigo baixo o epígrafe Bibliografía ordenadas alfabeticamente por autores e de acordo coa seguinte orde: Apelido, inicial do Nome, Ano de Publicación entre parénteses e distinguindo a, b, c, en caso de máis dunha obra do mesmo autor no mesmo ano, Título do Artigo (entre aspas) ou Libro (cursiva), Nome da Revista (cursiva) en caso de artigo de revista, Lugar de Publicación en caso de libro, Editorial en caso de libro, Número da Revista e Páxinas.
4. As notas irán numeradas correlativamente incluíndose o seu contido a pé de páxina e a espazo sinxelo.
5. As referencias bibliográficas deberán facerse citando unicamente o apelido do autor(es) e entre parénteses o ano.
6. Os cadros, gráficos, etc. irán insertados no texto e numerados correlativamente incluíndo o seu título e fontes.
7. O IDEGA confirmará por correo electrónico ó autor de contacto a recepción de orixinais.
8. Para calquera consulta ou aclaración sobre a situación dos orixinais os autores poden dirixirse ó correo electrónico do punto 1.
9. No caso de publicar unha versión posterior do traballo nalgunha revista científica, os autores comprométense a citar ben na bibliografía, ben na nota de agradecementos, que unha versión anterior se publicou como documento de traballo do IDEGA.