Fair Trades by Trade Fairs: Information Providing Institutions Under Monopolistic Competition

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ABSTRACT. It is a standard result of search theory that the optimal reservation supply price, e.g. wage, is negatively correlated to search costs. This paper applies the inverse relationship, between demand prices and limit prices, to the analysis of an hitherto unexplored topic: trade fairs. Trade fairs bloomed during the Middle Ages and early trade-based capitalism and survived for centuries. In last decades, their growth became sustained: they attract every year hundreds of thousands of exhibitors and tens of millions of visitors.

The driving forces behind the trade fair activity are increasing return to scale of search for information, under conditions of imperfect competition, particularly large group monopolistic competition. Under these circumstances, trade fairs offer their participants a collective substitute for information activities that would be beyond individual possibilities. This mechanism is of paramount importance for small firms. Where there are many small suppliers and buyers, and product differentiation, trade fairs give agents the opportunity of low-cost, high-density information exchanges, under space-time constraints. This leads to lower search costs and lower limit prices, then fairer trades. But this mechanism also implies natural monopoly or oligopoly: the larger the trade fair, i.e. the larger the number of suppliers and visitors who participate, the less the average cost of the service. More generally, natural monopolies arising from decreasing-to-scale search costs ask for a new view of government's role either in the organization or in the regulation of information exchanges. Policy implications for small business development are stressed, including tariff regulation, public investment, and involvement of small business associations in the design and organization of trade fairs.

Introduction

It is a standard result of search theory that the optimal reservation price is a function of marginal costs of search. In well known job search theory, reservation wages are inversely related to search costs. This is true for any supply price, while the inverse can be showed to be true for demand prices, as in the problem of a consumer who faces large-group monopolistic competition with incomplete information on prices/quality combinations (see Hey (1982), Salop and Stiglitz (1977), and Grether et al. (1992)).

It is interesting to note that in such a problem, if we can devise mechanisms to lower search costs, we may get lower limit prices, closer to marginal costs, and perform better trades: thus we would increase consumer welfare. Trade fairs are just an example of this kind of mechanism: many buyers and sellers agree to meet in certain days and in a certain place, in order to diminish transaction costs. In most actual cases, the buyer-visitor is not the end consumer, but a retailer who wants to optimize his portfolio of suppliers.

In old times the main reason for such a collective arrangement were high transportation costs, that rendered too expensive and risky for the suppliers or their representatives to travel regularly to meet potential customers and show samples of goods in offer. It was then convenient to fix data and places to meet. In turn, customers during trade fairs days were protected against fraud by some public surveillance on measurement of goods, legitimacy of contracts, exchange of currencies, etc.

But in our times the main reason for sustained increase of trade fairs activity are probably transaction costs associated with search for information. Under imperfect competition there is a range of prices for similar goods and they do not convey enough information about differences of quality to potential buyers. Thus buyers must embark in a search process. The probability to find the best or

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a satisfying quality/price ratio is a function of the frequency of contacts with suppliers, but there are costs associated to this stochastic process, and these search costs may be substantially cut by trade fairs. The organizer of a trade fair imposes space and time constraints to the search problem, and this rationing process can be efficient. In turn, the organizer of a trade fair is in a position of natural monopoly, because his own unit costs are decreasing with the number of participating firms, eventually until the whole industry joins the fair. Thus the classical argument for public intervention is in order.

The latter aspect is of paramount importance for small business, because trade fairs may be a powerful tool to sustain their information and marketing efforts, beyond individual limited budgets: and thus policies aiming at the promotion of small business should take into account trade fairs.

In fact where either oligopoly or oligoposony prevails, there is limited scope for large suppliers and for large buyers to use collective mechanisms for their marketing activities. First, where there are few suppliers and many buyers, the latter have small information costs, and transaction costs at large: they are able to easily identify prices and quality as offered by a limited number of suppliers, and make their choice. Second, where there are many suppliers and few buyers, the latter can arrange tenders or other efficient bargaining mechanisms. And where there are both oligopoly and oligoposony the above argument is reinforced.

This reasoning does not rules entirely out some scope for trade fairs in sectors such as the car industry, insurance services, aircraft production, and the like, but even occasional observation allows us to see that exhibitions in these sectors have a very minor function.

An entirely different framework of analysis applies to more competitive sectors, and particularly to those where one can observe elements of large group monopolistic competition, such as clothing, furniture, footwear, etc.

In these sectors we frequently observe a market structure based on a very large number of small firms on the supply side (their average domestic market share being even less than 0.1%), and also a very large number of small firms (dealers and retailers) on the demand side. At the same time, these markets are about slightly differentiated products, so that the standard condition for efficiency by pure competition cannot be appropriate. Prices do not convey enough information to consumers, and it is too costly for many small suppliers to advertise the quality of their own products, or for many consumers to visit many producers.

In these small business sectors, neither the former nor the latter have the opportunity to run substantial marketing/purchasing budgets: e.g. small business cannot pay for large advertising campaigns.

Under these circumstances, trade fairs offer their participants a collective substitute for an informational activity that would be beyond individual possibilities of smaller firms.

From the visitors side, e.g. a retailer, visiting the fair means the opportunity to collect at a very limited cost, a number of data: the list of exhibitors itself, addresses, names of contact persons, in some cases other standard business data. More: for a large sample of exhibitors, the visitor would personally ascertain the quality of the products, compare it immediately with rival suppliers, engage in preliminary contacts, etc.

As seen from a small retailer point of view (or by a small purchaser of intermediate goods) visiting regularly trade fairs is a powerful tool to achieve better trades, id est getting better quality/prices combinations, thus increasing profits as compared with a more passive information and procurement process.

As seen from a smaller supplier point of view, the reason to join the trade show is just the complement of the visitor's one. A small firm is unable to engage in a very active marketing process: quite often it serves the customers with whom it happens to get in touch, more or less at random. Being rather passive, a small firm who does not join the trade fair, whenever it exists and is an established meeting point, risks to be cut off by a large number of potential trades, because visitors will be satisfied by the information gathered at the fair, and will not engage in additional rounds of visits out of the fair. More, being at the fair gives an extra opportunity to be visited by new potential customers, otherwise too difficult to be revealed by active search. Again, trade fairs may have a potential for profitability of small firms, at

least as far as the cost of participate does not exceed the expected return.

The point needs to be stressed in connection with policies aiming at promoting small business. The above reasoning implies that improving trade fairs might be a powerful way to increase those industries where large group monopolistic competition prevails. But in the very same sectors the market power is unbalanced in favour of the very limited number of fair organizers as compared with the rather negligible influence on the organization of fairs that can be exerced by small business. This discussion is taken up in the policy section below.

Finally, the analysis proposed in the paper, while developed for a rather special topic, has a wider scope: it points to search for information in imperfect markets, with large number of competitors, as a fundamental force leading to natural monopoly in the supply of information networks and trading institutions.

The paper is in four parts: 1) a brief description of trade fairs; 2) a theoretical model of search for information; 3) some empirical evidence; 4) policy issues.

1. Background

Fairs are one among the oldest market institutions. Their name itself is from latin "feriae", and remebers us that in ancient Rome a typical arrangement for merchants was to devote certain holydays to meeting in appropriate places and exchanging goods. Religion and state were involved, in Rome as elsewhere in ancient world: public officials at fair days could collect taxes, provide protection against fraud, and offer suitable premises and organization. Similar institutions bloomed during the Middle Ages, and, just to give a standard reference, several contributors to the Cambridge Economic History of Europe (particularly see the essays by Glamann, Jones, Postan, Lopez, Verlindem, Von der Wee) recognised the important role of trade fairs in connecting markets in continental Europe (around 60 fairs are cited, among which Lyon was probably the most important).

In old times the main reasons for trade fairs were transportation and communication costs, but also the problems arising from different currencies and measuring systems. Public officials were in charge for controlling standards of measurement, and there were arrangements for the conversion of currencies and credit letters as means of payment by traders from different countries. During the time and within the space of the trade fairs, trades were supposed to be fair.

Highly sophisticated stock exchanges of our times stem directly from arrangements of this sort, gradually assisted by a corpus of legislation, and by various kind of collective regulations.

One can wonder why there is even today a demand to meet in some days and in some places to trade. Transport costs has so fallen in last century, communication networks are now so developed, currency and credit arrangements are so easily available all around the world in market economies, and retailing and other fine tuned marketing systems are so widespread, that one could think that there is no room left for the old system of trade fairs. But the evidence is the other way round. A sustained increase in supply and demand of trade fairs can be observed since World War II, and there are no signs of a reverse trend.

According to statistics by the U.S. Trade Show Bureau there are probably around 2,800 major exhibits (more than 10,000 square feet net area) per year in the United States, with more than 15 millions of visitors and around 800,000 exhibitors. In the Federal Republic of Germany trade fairs are among the major activities of cities such as Hannover (1,600,000 visitors per year), Frankfurt, Munich, Köln, Düsseldorf (each between 800,000 and one million visitors). In London there are located around 170 trade fairs with more than than 400,000 square meters of net area. In Italy, the official list by the Ministry of Industry and Trade comprises more than 250 national and international events (more than 80 in Milan), but there are also, hundreds of regional and local fairs.

The supply of appropriate premises is often a concern for local public authorities, who also are in charge for providing connected infrastructures, particularly transport and parking areas. Public bodies are also in charge for harmonizing trade fair calendars, and for some kind of overall control on the service. The service itself, sometimes offered by public bodies, but often also by private companies or by trade associations, essentially

consists of leasing space in the public premises for some time and reallocating it at a given price to exhibitors. Thus the core of the business is selling space-time units to firms that want to show their goods to visitors. In turn visitors may be charged an entrance ticket, but more often entrance is free for target groups: access to the trade show give visitors the opportunity to inspect goods of rival suppliers, to check quality and prices, to gain face-to-face contacts with managers of many firms.

Most fairs are to a given industry the single point in space and time where firms present new products to potential customers, and where potential new customers enter in contact with suppliers. Thus there is an intense and concentrated exchange of information on both sides. In fact, the exchange of information is the main driving force behind contemporary trade fairs, where, in contrast with past times, often the amount of actual trade during the exhibitions days is negligible: to the analysis of this process I turn in the next section.

2. Fairs as information intermediaries

2.1. *Market and information structure*

The environment I wish to consider is large-group monopolistic competition. Consider the buyer search problem in such a market, in which goods slightly differ in qualitiative aspects, but supply prices, known to the buyer, for some reason fail to reflect these differences.

Suppose we have a many-consumer, one-good economy, with N suppliers, where each consumer has an indirect utility function V depending upon price Pd he is willing to pay for the x good. Any income is lump-sum. There are a large number of both small suppliers and buyers.

Demand price for x good in turn is function of quantities D and of qualitative characteristics Q. The latter can be boiled down to a numerical index, so that we may assume that the demand function is real valued and has any standard form properties we shall need below. I can thus write:

$$D = D[Pd(Q)]. \tag{1}$$

Also minimum supply prices, id est marginal cost, are function of quantities S and qualities Q, but this function is firm-specific: some firms are less efficient then others to get a given quality level for a given quantity of output, or they deliberately avoid to behave as quality maximizer: thus there may be for two firms the same supply prices, but different qualities, or the same qualities with different supply prices. Again I suppose there is one well defined relationship for *each* firm between any quantity/quality combination and production costs, Ps:

$$S = S[Ps(Q)]. \tag{2}$$

If information is perfect, and standard (often unrealistic) additional conditions hold, qualitative differences may lead to a sort of monopolistic competitive equilibria, where:

$$Pd^* > Ps^*, \tag{3}$$

id est, at equilibrium $D = S$, transactions are fixed where average costs equal demand prices, above marginal costs. There are no monopoly profits, but there is an aggregate welfare loss. This standard equilibrium assumption is not crucial, and the search theory literature has explored other hypothesis, e.g. the reader may otherwise think to supply prices as exogenously given. With more general hypothesis, such as endogenous pricing (Salop, Stiglitz, 1977) convergence to equilibrium may be difficult, but I will stick here to the simpler case.

Suppose now that information to consumers on quality Q, as achieved by each firm, is not perfect, possibly because the N suppliers are unable to fully communicate to potential buyers the Q-aspects of their "own" variety of x, or because they do not want to do so. The rational consumer must then gather some information, and this may have a certain marginal cost, say c, where the unit of measurement is a standard bit of effort to get a standard bit of information.

Just to fix ideas, c may consist of marginal travel costs and opportunity-costs of time for a visit to a supplier in order to personally inspect the good he offers.

The demand prices of the consumer now depends on three variables, quantities, qualities and the total cost of search of information on qualities, D:

$$D = D[Pd(Q, C)]. \tag{1bis}$$

But while the "individual" marginal cost per unit of information gathered may be known in advance, for example, it may be a function of distance

between points in space, id est location of suppliers, the total search cost depends on how quickly the consumer is able to get the "optimal" combination of quality and supply price. In turn this implies some hypothesis on the information available ex-ante: e.g. about frequency and level of minimum prices, or on the probability distribution of qualities, etc.

To make things easy, suppose just that

$$C = C(n); \text{ with } c = dC/dn > 0 \qquad (4)$$

where n is the number of visits necessary for the consumer before a "fair" trade is fixed. At this stage I will make no assumption about the form of this function (a constant c will be used below, but this is just to make things simpler).

Obviously to make $n = N$ visits in general is not an optimal strategy: even if the probability distribution of Ps/Q ratio is unknown to the consumer, to visit all the suppliers to get full information would be not only inefficient, but unfeasible for a consumer with a limited budget.

We need now to specify more the problem, in order to discuss one of many possible information structures and strategies.

Remember that while there is only one good in the economy, there are different qualities and supply prices. The consumer aiming at the best quality for the minimum price is faced with the decision at which stage of search to stop gathering information. Only with marginal search costs always at zero (including zero opportunity cost of time!) we can be sure that it is optimal for the consumer to collect information on all suppliers. For positive c, $C(N)$, if feasible, may be large enough to involve a net utility loss, or less utility increase than the marginal utility associated to stop the search after n (less than N) number of contacts, where N is the number of potential suppliers. In such case:

$$V[PN, C(N)] < V[Pn, C(n)] \quad \text{for some } n < N. \qquad (5)$$

where P with a subscript is the transaction price achieved after n or N contacts.

I discuss now the consumer search strategy, when the probability distribution of P/Q ratios is known, but the information on a large number of individual suppliers is unknown. This is a strong hypothesis, but it does not affect the conclusion above (less information may imply more welfare loss, then more benefit from trade fairs).

2.2. *The search process*

The consumer problem as stated above has some analogy with the problem of a worker looking around for different jobs offered at different, unknown, wages.

The analogy can be made strict if we consider that the vector of qualitative characteristics Q and prices Pd are so related that instead of looking for unknown qualities and known supply prices, the consumer has just to look for unknown "equivalent prices", where P is now to be seen as a vector:

$$PQ = p1, p2 \ldots pn \ldots pN, \qquad (6)$$

each element of which reflects a weighted assessment of quality Q and supply price Ps, e.g. simply Ps/Q, related to the n firm. Even if there are few Ps, or just one, there may be now many Ps/Q, according to the dimension and distribution of Q among the N firms.

To calculate the amount of search needed, we should compare marginal benefits and costs of search, but in a sequential stochastic search we are not able to calculate directly the optimal number of visits because this depends upon how lucky we are in extracting from the sample of suppliers the one who offers the minimum equivalent price. It is true that for utility maximization, marginal cost of search must be equal to marginal benefit of search, but before starting the search, the outcome is unknown.

If we do not know in advance the minimum equivalent price and its probability to be extracted, the consumer is left no alternative as to fix in advance a reservation or limit price, r, which is the maximum quality-equivalent price that he would accept. When the buyer visits the supplier he may inspect whether ps and Q is more than r, and go on with other visits, until he finds ps and Q equal or less r.

I drop now the above notation for prices, and write simply p for "quality adjusted" prices. It is convenient to take

$$0 < p < \infty \qquad (7)$$

We know that for any arbitrary value r among p,

$$F(r) = \int_0^r (p)\,dp \tag{8}$$

and obviously also

$$1 - F(r) = \int_0^\infty (p)\,dp \tag{9}$$

It is useful to have a general formula for the net expected return for the consumer to make another visit when the reservation price is r, or the marginal net outcome of searching:

$$E(\sigma|n, r) \equiv \sigma \tag{10}$$

This might be thought as:

$$\sigma = E[(p|p \leqslant r) \cdot f(p|p \leqslant r)] + \sigma f(p|p > r) - c \tag{11}$$

The first term in the R.H.S. is the expectation of paying p, id est accepting the trade, conditional of p being equal or less than r, multiplied the probability of p having such value.

Note that:

$$E(p\,|\,p \leqslant r) = \frac{\int_0^r pf(p)\,dp}{\int_0^r f(p)\,dp} \tag{12}$$

and thus

$$E(p\,|\,p \leqslant r)\,E[f(p\,|\,p \leqslant)] = \int_0^r pf(p)\,dp \tag{13}$$

The second term of R.H.S.(11) is the return to search, σ by definition, multiplied with the probability that p exceeds r, which implies a new search round.

Obviously the probability of p being not acceptable, in the second term is:

$$f(p\,|\,p > r) = \int_r^\infty f(p)\,dp \tag{14}$$

The third term is the search cost, which I will assume now to be a constant.

I can thus right:

$$\sigma = \int_0^r pf(p)\,dp + \sigma \int_r^\infty f(p)\,dp - c \tag{15}$$

Solving for σ gives

$$\sigma - \sigma[1 - F(r)] = \int_0^r pf(p)\,dp - c \tag{16}$$

or

$$\sigma = \frac{\int_0^r pf(p)\,dp - c}{F(r)} \tag{16bis}$$

This formula has the following interpretation: the expected net marginal return to the buyer of visiting a supplier, is the expected return associated with paying r or less, minus the unit cost of search multiplied for the expected number of searches, which is:

$$\frac{1}{F(r)} = E(n) \tag{17}$$

which in turn implies that the total cost of searching is (under constant c)

$$C = c/F(r) \tag{18}$$

Now we look for the marginal impact on the equilibrium of changes of c, which is what trade fairs are for.

It can be showed that for a continuous distribution of prices, and for a large number of suppliers, the optimal reservation price is such that the marginal cost of search equals the stochastic integral of differences between actual and reservation price.

We need before to look for this equilibrium. To evaluate the impact of a marginal change of the reservation price, I take the first derivative of (16bis) with respect to r. This gives

$$\frac{\partial\sigma(\cdot)}{\partial r} = \frac{rf(r)\,F(r) - f(r)\left\{\left[\int_0^r pf(p)\,dp\right] - c\right\}}{F(r)^2} \tag{19}$$

where I have used the quotient rule, and noted that the derivative of $F(R)$ is $f(r)$ and that $rf(r)$ is the derivative of the expression under sign of integral in (16bis).

Setting (19) equal to zero implies that σ achieves a stationary point when

$$0 = r^* F(r^*) - \int_0^{r^*} pf(p)\,dp - c \tag{20}$$

where both sides have been multiplied for $F(r)^2$ and divided for $f(r)$. This allows to write c as

$$c = r^* \int_0^{r^*} f(p)\,dp - \int_0^{r^*} pf(p)\,dp \tag{21}$$

that can be conveniently rewritten as

$$c = \int_0^{r^*} (r^* - p) f(p)\,dp \tag{21bis}$$

This formula makes clear that in equilibrium, the marginal cost of search must be equal to the expected return of an additional round of search: and this is given by the integral of the condition probability of the difference between the reservation price and the quality-weighted actual price.

At a competitive equilibrium there must be no difference between r and p, because there is just one possible equilibrium price, with certainty: thus there is no scope for search of information. Having found a value for c, I can eliminate it in (16 bis) by means of the latter equation, and this gives:

$$\sigma^* = \frac{\int_0^{r^*} r^* f(p)\,dp}{F(r^*)} \tag{22}$$

which simplifies in:

$$\sigma^* = r^* \tag{23}$$

This states that the optimal limit price r^* is such that the consumer is indifferent between accepting to pay precisely $p = r^*$ and adding a new round of search for information, with a gain σ^*.

Finally, I differentiate (21bis) with respect to c, and this gives:

$$0 = \frac{\partial r^*(\cdot)}{\partial c} F(r^*) - 1 \tag{24}$$

or

$$\frac{\partial r}{\partial c} = F(r^*)^{-1} > 0 \tag{25}$$

The derivative of the reservation price with marginal search costs *dr/dc* is positive: less the search costs, less the acceptable price by the buyer, and vice versa. And this positive relationship is the stronger, the less is the probability to find a price less than the limit price.

This has a clear welfare impact. For the Roy identity:

$$\frac{\partial v^h(\cdot)}{\partial r^{h*}} = -\alpha x^* \tag{26}$$

a marginal change of any price is exactly measured by the product of marginal utility of income α with consumption x at r.

Then, marginal h-individual indirect utility of search cost for information are

$$\frac{\partial v^h(\cdot)}{\partial c} = \frac{\partial v^h(\cdot)}{\partial r^h} \frac{\partial r^h}{\partial c} = -\alpha^h x^{*h} F(r^*)^{-1} \tag{27}$$

and the marginal social welfare may be, with a Bergson-Samuelson type welfare function:

$$dW \equiv -\sum_h \beta^h x^h F(r)^{-1}\,dc \tag{28}$$

where β^h are the welfare weights.

Being C a function of time and transport costs, trade fairs allow the consumer to save on both. Thus c diminishes, and the limit price diminishes also.

Under imperfect competition with incomplete information, trade fairs allow fairer trading because they offer a mechanism of convergence of limit prices towards competitive prices.

2.3. *Increasing returns to scale*

It is easy to show that there are increasing returns to scale in this process, because in principle the more suppliers participate in the trade fair, the more c will diminish (at least as far as there is no congestion).

With constant, c, as above, $C(n)$ may be specified in linear form as

$$C = a + n(k + w) \tag{29}$$

where k is unit travel cost and w is the opportunity cost of time of search. If the trade fair represents M firms out of N, and the consumer adopt a strategy of proportionate sampling from exhibitors and non exhibitors, the search cost function is

$$C = a + (n - m)(k + w) + m\,(k' + w') \tag{30}$$

where variables with superscript are the new unit costs, as diminished by the trade fair, or:

$$C = a + n(k + w) - m\,(\Delta k + \Delta w) \tag{31}$$

The more suppliers participate in the trade fair, id est the more m tends to N, the more it will represent an undistorted sample of the universe, so that it is less necessary to search outside the fair, marginal costs converge to $(k' + w')$ and r^* converge to minimum quality adjusted price, id est to Pareto-efficiency, the more c is near to zero.

Thus the mechanism has two driving forces: diminishing unit transaction costs, and the relative frequency of exhibitors to the universe. One would expect that the trade fair has to be located in space and time to get maximum difference of transportation cost and time, and that their organizer would try to attract the largest number of exhibitor if he wants to maximize consumers welfare.

This conclusion is reinforced by a more general search function, which may allow for the fact that in absence of a trade fairs mechanism there are decreasing returns to scale of search, because the longer the visitor's trip, the more costly it may be in terms of transport and of opportunity-cost of time.

Under such specification, I would expect a positive correlation between number of exhibitors and of visitors.

2.4. *Natural monopoly (or oligopoly)*

The organizer of a trade fair has the control of a fixed amount of time and of space within an appropriate infrastructure, where he makes the arrangements for the exhibit. In the short term there are more or less only sunk costs: leasing, advertising, surveillance, insurance, etc.

Thus, the more firms participate, the less the average cost for each exhibitor. At the same time, the more firms participate, the larger the benefits, and hence the demand, from the visitors.

The organizer of the trade fair may extract monopoly profit from both the participating suppliers and by the visitor, selling them access, at least until the marginal benefits to join will not exceed the cost of participation. In fact, if the trade fair organizer were allowed to discriminate prices, e.g. by auction, he may be able to appropriate all the producer and consumer surplus arising from the trade fair.

The monopoly is natural in the sense that, exogenously given a number of suppliers and of buyers, and thus defined the potential demand for trade fair services, and given the fair capacity, the more firms join, the less the average cost of the service: no congestion is supposed to occur. Of course, spatial and qualitative imperfection may justify natural oligopoly: in fact, this is the normal case.

This offers a justification for actual large public involvement in many countries in these activities.

Now I turn briefly to the problem of the supplier, who is concerned with the decision to join the trade fair.

As said, under standard large-group monopolistic competition with perfect information the supplier is not able to extract monopoly profit, because he equates prices and average costs. But with imperfect information he may be able to gain a rent, as an expected positive difference between consumer's reservation prices and his own supply prices (note that this is again an expected value, depending on the probability of being visited by a consumer who accept to trade).

But we have seen above that trade fairs lowers reservation demand prices, so that the producers rent must diminish. So, why do suppliers participate in the trade fairs?

Clearly, a compelling reason is that they would risk too much not to participate, because trade may be function of number of visitors. If the search for information by the consumers concentrates in the space/time of the trade fair, the supplier who does not join it as an exhibitor, risks to be less visited, so that the quantity of the trades out of the organized market goes down, until near zero trade when near all the competitors join. This

also explains why small-group monopolistic competition is unfavourable to trade fairs: it is easier for the suppliers to agree *not* to join.

A second reason for joining is the following: suppliers have also information costs, in order to get in touch with different consumers. Let us assume that exhibition space is granted in sq.m./day as opposed to discrete portions (as is usually the case) and that the hiring price includes all the facilities (insurance, security, cleaning, etc.). If we assume that the firm intends to maximize its own profit, we may consider its participation expenditure as a short term investment cost. For the representative firm, the participation will therefore be justified if the actual net value of the incremental profit generated is positive; id est if the additional benefits, exceed the additional costs of participation. Since the costs per additional unit of participation are known, and are equal to a certain multiple of the rental price (which includes preparation expenditure, and personnel expenditure, etc.) what remains to be determined is the marginal expected benefit.

What volume of incremental sales will be generated by one more sq.m./day? If the firm had this piece of information, the problem would be of immediate solution: it should buy more exhibition sq.m./day up to the point when the price per unit fixed by the organizers of the trade fair (multiplied a given mark-up) and its own marginal benefits coincides.

The crucial aspect of this decision rule is that, the exhibitor should forecast the additional revenues. Before proceeding further in our analysis, however, it must be noted that these additional gains are not necessarily reaped through sales made during the trade fair period; more often, they will come from an increase in sales during the following months, increase which must be considered as the result of contacts, exchanges of information, made at the trade fair. In other words, the additional gains are a product of the information which has been sent to the market, and, by the passing of the years, of both the cumulative effect derived from constant participation and of those innovative/informative processes which may derive from the annual participation to the fair.

Additional sales probability will therefore be a function of the trade fairs' actual capacity to give both active information (from the exhibitor to the visitor) and passive information (in the opposite direction, and also horizontally: viz., between exhibitors). The incremental benefits are function of the trade fair capacity to attract both exhibitors and visitors in large numbers (dimension effect), and they are also a function of the ratio between visitors and exhibitors (concentration effect).

3. Data

The discussion until now has been almost theoretical. The present section does not offer a full empirical analysis, which goes beyond the scope of this paper, but just show that there is some evidence which does not contradict the previous reasoning.

TABLE I

Trade fairs within EEC: average data 1987 for a sample of 253 trade fairs extracted from a database of 5000. Unit cost per visitor is the relevant signal for the exhibitor on information potential of the show

	n. visitors/ n. exhibitors	unit cost of lease (ECU/square meter)	unit cost/ n. visitors
EEC SAMPLE	58.94	83.64	0.0092
France	135.04	123.59	0.0066
Italy	53.21	64.04	0.0052
Germany	60.31	71.80	0.0070
Great Britain—Ireland	29.95	129.32	0.0177
Spain—Portugal—Greece	45.16	34.31	0.0056
Belgium—Denmark—Holland	55.27	64.14	0.0114

Source: Cerved

According to our discussion the number of visitors must be positively correlated with the number of exhibitors, probably with increasing returns.

Statistical information on trade fairs in the world is scant. Available data include rental costs, number of visitors and of exhibitors, dates and time-length of the main fairs, sector and country.

From the data-base of around 5,000 fairs (Cerved) we have extracted a sample of 253 trade fairs (specializing on 60 sectors) where the above data are available: 70 trade fairs in West Germany, 49 in Italy, 45 in Great Britain, 30 in France, 18 each in Belgium and Spain, 9 in Holland, 5 each in Denmark and Ireland, 2 each in Greece and Portugal. We have grouped the 60 sectors in 4 aggregates: light industries (comprising furniture, clothing, foot-wear, textiles, jewelry, cosmetics, gifts, handicraft, wall-covering, and others); agriculture and food; personal services and entertainment industries (tourism, advertising, sports, etc.); metal working and other industries (including computer, car, glass, etc.).

Taking the number of exhibitors as a dependent variable, we have tried different model specifications with explanatory variables selected among the following:

- number of visitors (per each fair and per day)
- attractiveness of the fair (a sum of the number of visitors and of exhibitors)
- cost of participation for the exhibitor expressed either by cost per square meter (in Ecu) or by the ratio between the latter and the number of visitors
- sectorial dummies
- timing dummies.

A cross section analysis has been carried out for the total sample and for the following countries and groups of countries: France, Italy, West Germany, UK + Ireland, Spain + Portugal + Greece, Belgium + Holland + Denmark. For these countries table I shows average sample data.

We have tested both linear and log-models. In brief, these are the main results of the analysis:

a) as expected there is a significant positive correlation between the log of number of

TABLE II

Regression analysis of trade fairs participation frequency: A cross section analysis has been carried out for the total sample, Dependant variable is log of number of exhibitors

Dependent-var.	Constant	Coeff (t) ind. var		R^2	F-STAT
LVIS/LCMQ	0.48	0.54	0.04	0.41	90.3
	(1.0)	(13.3)	(0.5)		
LVIS	0.62	0.54		0.42	180.8
	(1.6)	(13.4)			
LVISG	1.0	0.59		0.39	157.5
	(3.5)	(12.5)			
LCUMQ	3.5	−0.43		0.30	107.6
	(15.3)	(−10.4)			

Legenda: CMQ: Cost per square meter;

COCON	(CMQ/NVIS/NESP)
CUMQ	(CMQ/NVIS)
CUMQG	(CMQ/VISG)
FREQ	Number of months
NESP	Number of exhibitors
NVIS	Number of visitors
PRO1	(NESP + NVIS)
PRO2	(NESP + NVIS) 2
VISG	Visitors per day

L before the code means log of the variable

exhibitors and the log of number of visitors (see Figure 1);

b) variables connected with rental cost are statistically significant, but the simplest specification (cost per square meter) has weak correlation and the parameter has positive sign; the expected sign and higher correlation are shown by the ratio between rental cost and number of visitors, i.e. a proxy of contact costs (see Figure 2);

c) sectoral dummies are not significant;

d) there are some differences among country-group (see Table III). Italy, Germany and Great Britain show a better fit with the number of visitors per day as explanatory variable, while France, Spain + Portugal + Greece seem to be more sensitive to the cost variable; finally, Belgium + Denmark + Holland do not show a good fit with either specification. It is possible that these differences may be of interest in the EEC perspective, being the trade fair industry an international sector.

These results, while simply indicative, are broadly in line with our discussion above and may encourage further empirical research.

4. Policy issues

I have suggested some reasons why trade fairs have an important role in sophisticated economies with imperfect markets. I turn now to discuss if there is some scope for public concern about the control of trade fairs organization.

Three policy issues arise from the above discussion.

First, there is a classic case for the control of natural monopoly. In the short-term the production cost of a trade fair are almost entirely fixed: capital costs related to the use of buildings and other infrastructure, advertising, administration, services of insurance, etc. Thus private marginal costs of the organizer are approximately decreasing, while demand by the potential exhibitors is increasing with the number of prospective visitors. Under these circumstances the organizer of the trade fair is able to extract monopoly profit and there may be a welfare loss for a standard micro-economic argument. More: price discrimination is feasible, because heterogenous exhibitors may have different willingness to pay and in principle the organizers may allocate space/time units by auction and prevent further trading. In fact, price

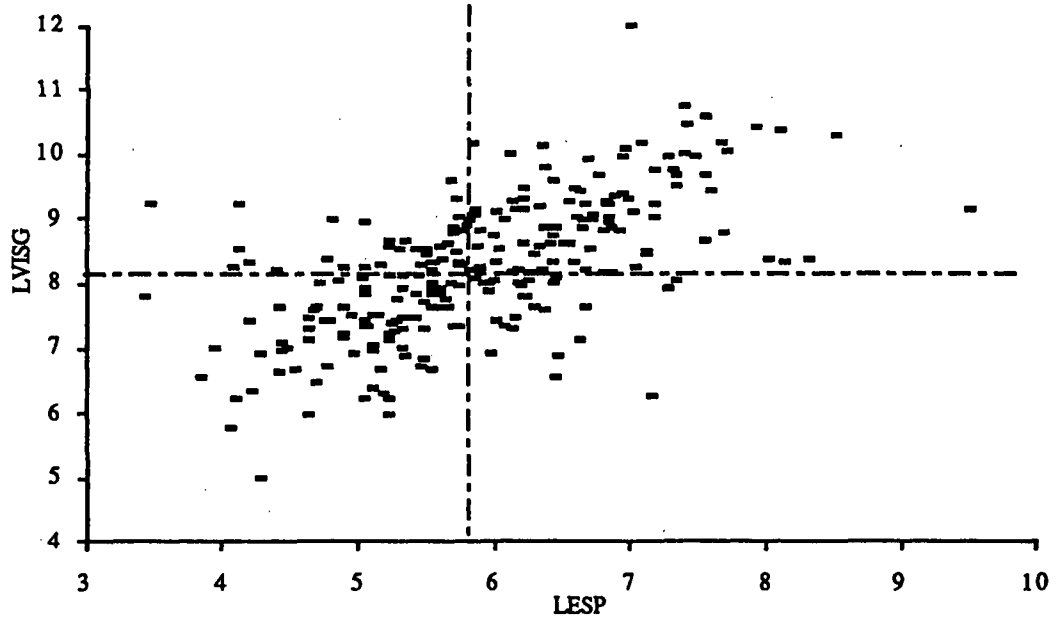

Fig. 1. Visitors per day and number of exhibitors: scatter of logs.

LESP = Log number exhibitors; LVISG = Log number visitors per day

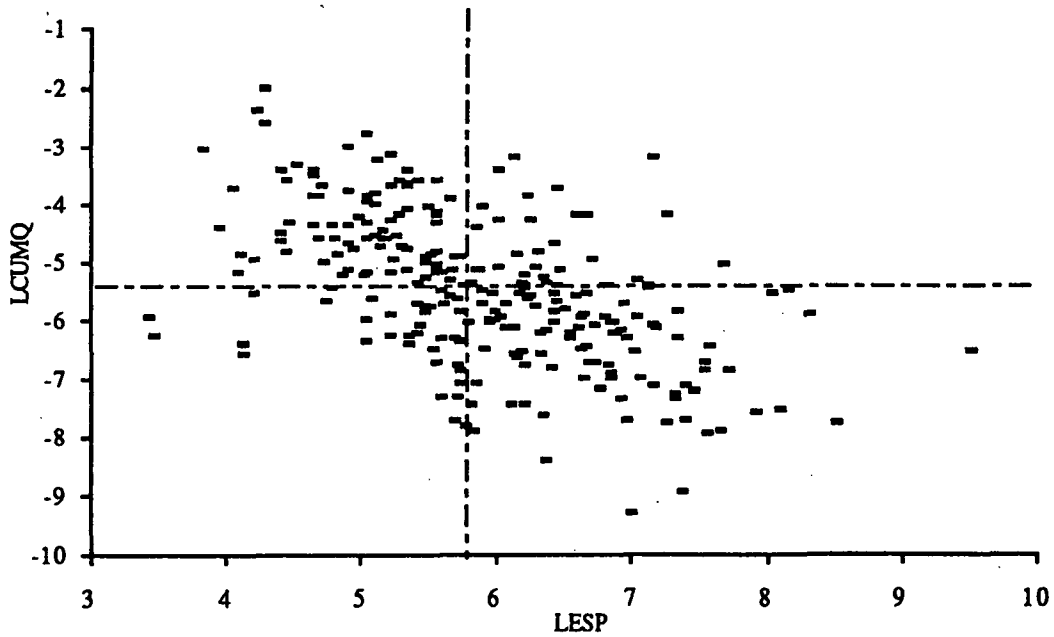

Fig. 2. Contact costs per visitor and number of exhibitors: scatter of logs.

LESP = Log number exhibitors; LCUMQ = Log (cost per square meter/number visitors)

discrimination in such form is not common practice, but there are frequently arrangements intended to the same purpose: e.g., unit rental price is fixed, but there may be informal individual discrimination concerning quantity and quality of the space allocated to exhibitors.

In a global perspective and in the long run things are, of course, different. A trade fair is essentially a local good (in fact, a sort of club good) and rival trade fairs located elsewhere can compete and attract exhibitors, in a sort of Tiebout-like mechanism of competition. And fair trades facilities in the long run can be expanded in order to accommodate any excess demand: but this may imply construction costs and congestion costs, so that the returns may be constant or decreasing.

While the latter may be true in some cases, as a matter of evidence in most industries there is a very limited number of international or national trade fairs, and it is common practice to avoid overlapping in timing. So, monopoly elements prevail.

Actually, there is some evidence that in practice monopoly profit is not widespread for one or more of the following reasons: a) most trade fairs infrastructures are owned by public bodies who rent them at prices well below those of a profit maximizer; b) many trade fairs are organized by non-profit companies, some of them belonging to associations or directly to public bodies; c) in some cases tariffs are regulated by public bodies. How effective these policies are must be ascertained in individual cases, and I will not dwell on such particular aspects.

Second, and more important, there are joint productions and positive externalities connected with trade fairs (and some negative ones related to congestion in the host area, but I will disregard this issue here). A well organized trade fair improves on unorganized trade, and one would expect that both visitors and exhibitors were charged a participation fee so that costs and benefits are internalized by the market for space/time units of trade fair service. But even if the trade fair organizer were a public enterprise applying tariffs at marginal costs, according to standard rule, it is unclear how the tariffs should be shared among

TABLE III
Country estimates. Dependent variable as in Table II

Depend-var	indep-var	constant	Coeff. t ind. var.	R^2	F-STAT
FRANCE					
NESP	VISG	442.3	0.004	0.12	4.0
		(6.9)	(2.0)		
NESP	CUMQ	598.2	−17668.2	0.14	4.6
		(7.4)	(−2.1)		
LESP	LVISG	2.5	0.38	0.14	4.7
		(1.6)	(2.2)		
LESP	LCUMQ	4.4	−0.27	0.10	3.3
		(5.2)	(−1.8)		
ITALY					
NESP	VISG	259.4	0.055	0.43	35.9
		(2.4)	(6.0)		
NESP	CUMQ	900.7	−42580.2	0.13	7.3
		(6.8)	(−2.7)		
LESP	LVISG	−0.24	0.74	0.54	54.9
		(−0.3)	(7.4)		
LESP	LCUMQ	2.6	−0.59	0.43	35.8
		(4.4)	(−5.9)		
GERMANY					
NESP	VISG	386.3	0.051	0.28	26.7
		(3.1)	(5.2)		
NESP	CUMQ	1013.8	−24534.0	0.11	8.8
		(8.8)	(−3.0)		
LESP	LVISG	0.64	0.66	0.53	77.1
		(1.0)	(8.8)		
LESP	LCUMQ	2.9	−0.57	0.48	65.2
		(7.0)	(−8.1)		

exhibitors and visitors, being the frequency of visitors positively correlated with the frequency of exhibitors.

There is evidence that most trade fairs organizers put no charge (or minimal) on visitors, while they have arrangements for discriminante entrance according some non-price rationing system (such as "by invitations only", registration procedures with some screening, etc.). Under such arrangements a substantial part of the users do not pay for the service, and marginal costs are covered by exhibitors only (and it cannot be said in general how much they recover these costs by the actual trades they will do).

Third, there is asymmetric information, because the exhibitor is not able to know directly how many visitors the fair has attracted, and how good they are as potential buyers. He must rely, and take his decisions about participation, upon information disclosed by the trade fair organizer, who clearly has incentives to inflate data. It is important to understand that the amount of information under direct control of the exhibitor is unsufficient, because the individual exhibitor cannot infer the universe from his own sample. Again, some kind of collective regulation about release of information on trade fairs effecitveness is in order.

As mentioned in the Introduction, these issues are of paramount importance for policies targetted to small business development.

There may be different ways to regulate trade fairs in order to render them more effective towards small firms: a) control of tariffs in order to avoid pure monopoly profit; b) government subsidy to long term investments in these areas, such as building, communications, parking facilities,

etc.; c) involvement of trade associations in the provision of the fair service.

Tariff regulation may be crucial as far as small business is concerned because a monopolistic trade fair organizer may potentially discriminate among firm sizes and offer different prices or — more often — the same price but different location inside the fair. Large firms are often regarded as prestige exhibitors by organizers of trade fairs, while — as said — in a sense they may have less incentive to participate: this may motivate organizers of fairs to offer the best location within the exhibition area to large firms, and/or to offer them a discount on the large spaces they rent.

While this discussion was not comprised in my model, a trade fair is not a homogenous space: there are gravity centres and peripheries, id est hierarchical relationships in the artificial and time constrained fair space.

An arrangement that would promote a fairer competition among firms of any size would be to rule out price discrimination and/or special privileges (e.g. to assign posts at random, or by other objective criteria). Under this perspective, tariff regulation must be carefully designed and should cover different aspects of the service offered by the trade fair.

A government truly concerned with small business development should be prepared to subsidize to a certain extent trade fair long term investments. As mentioned the main item in this area is the cost of infrastructure: exhibition buildings, congress centres for events parallel to fairs, parking areas, shuttle service with airports and railway stations, etc. In many cases there may be issues of urban planning and land availability. While in principle there may be enough expectation of profits to attract private developers and investors in the business, this is not granted if tariffs are so regulated as to coincide more or less with long run social marginal costs: and if the natural monopoly case holds, tariffs may be too low to provide enough room for private initiative. This is not said in the vein to advocate unordered public investment in this area, but it looks likeable that some cost-benefit analysis would often reveal social benefits from the extension of trade fair capacity to accommodate a larger number of exhibitors and visitors, and it may pay to subsidize in some way these social benefits as far as they are not internalized by private supply.

Finally, trade fairs would better serve the aims of a policy in favour of small business if there is some involvement of trade associations that may represent the specific interests of these firms, particularly of retailers, handicrafts, etc. These associations should have a voice and some bargaining power in the process of designing and planning trade fairs.

Concluding remarks

While trade fairs are an unexplored object in economic literature, with only occasional references by economic historians, I suggest that the topic is worthwile of inquiry. Trade fairs are important market institutions, and in some industries, particularly those with elements of large group monopolistic competition and imperfect information, they are a crucial feature of the economic environment.

The study of trade fairs sheds light on many aspects of those markets where there are many small firms. In this paper the focus is on search for information. There is evidence that concentration of markets under time and space constraints may be desirable by agents, because it diminishes costs for gathering information on quality and price.

Public policy is involved in order to plan trade fairs as efficient information exchanges, and there are here many specific issues that call for empirical research, such as public ownership versus regulation of trade fairs infrastructures and management; sharing of costs between agents; cures for asymmetric information. While this goes beyond the scope of this, rather exploratory paper, and need to be done for single sectors and countries, I feel that some substantive conclusions may emerge by a better understanding of fairs mechanisms.

Thus the reader may consider that trade fairs are perhaps just elements of a larger set of economic institutions: those aiming at high-density exchange of information in imperfect markets, with many agents, who may differentiate products, but are unable to fully communicate information on the quality/price combination they offer.

There is here some analogy with Grether et al. (1992, p. 771) when they conclude their experimental analysis on search models of shopping behavior, as follows: "*When noncompetitive outcomes occur, Pareto improvements are possible in theory. This poses the question whether real world*

institutions exist or could be brought into existence that would make markets closer to competitive equilibria. Informational intermediaries, such as consumer buying services, sometimes are seen and cable television services occasionally provide comparative price informations to subscribers. Developing and testing the theory of such information providing institutions would be a useful next step".

I have argued that trade fairs are an important example in this class of information intermediaries, particularly when the information to be processed comprises many small agents, many slightly different products, and a disperse range of prices.

An open list of similar environments may include the information systems connected with the functioning of stock and commodity exchanges, the collection and management of financial and commercial data (e.g. balance sheets) by means of large computerized networks, the infrastructure for the informative activity of trade and consumers associations and the organization of professional meetings and conventions, the implementation of videotext services, advanced computerized flight booking networks, the design and planning of urban shopping centres. In all these examples, while apparently heterogenous, an essential feature is the existence an appropriate infrastructure (e.g. buildings, host computers, cables, software, etc.) to concentrate scattered information on thousands of agents and products in one "point", and then make it accessible to many users in the most efficient way: in some cases users do not need to "walk" to search for information, they just have to connect and brouse in a video, but the process is the same: less search costs by more concentration and accessibility of data.

The understanding of these structures might have far reaching implications about the role of governments: as somebody said, the market for information is inherently informationally asymmetric, because you would not buy an information you know, while you do not know the value of buying an information you don't know. Thus whenever markets imply exchange of information associated with exchange of goods (e.g. in the example made by Akerlof (1970)), there may be inefficiency, and it is interesting to study how governments may influence transparency and fairness of trades by institutional collective arrangements, such as the one here discussed. It is also clear that availability of these institutions will be important to lower informational entry barriers.

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