RIVALRY AND EXTERNALITIES IN SECONDARY ART MARKETS*

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The present paper continues to build on the microeconomic foundations presented in previous works [1] where some essential concepts were treated in greater detail than is possible here. The primary analytical framework is a variant of a Lancastrian utility function whose characteristics are "decorativeness"; namely, color composition, subject matter, narrowly defined craftsmanship, etc. and "intellectual appeal"; art historical significance - often indirectly derived - peer evaluation, distinction, etc. clearly externalities will be associated with the latter.

In the original Lancastrian model, one assumes the existence of a mapping function. That is, a consumer technology capable of translating "characteristics" into the more traditional "demand function." This leaves the microeconomic foundations of "consumer technology" insufficiently explored.

My objective is to investigate several aspects of a consumer technology in the arts and hopefully to lay a foundation, in the neo-classical vein, for market equilibrium and market clearing. The present model is focussed on graphic, that is, pictorial and the plastic arts where the presence of characteristics of "intellectual appeal" is crucial; application to other narrowly defined "nonutilitarian" products is feasible.

The paper first analyzes how demand for art is created by a complex process of advertising, promotion of exhibits, salon gatherings, literary contributions, collector and museum curator appeals, etc. The essential features of this process are that the saleable advertising-product combination must be discovered by a process similar to technological R & D. Again while such environments may exist in other markets, they are much more typical of art markets, where investment in consumer technologies tends to elicit what has been termed syndicate behavior.

A probabilistic net revenue or rate of return to investment function for dealer-specific consumer technologies is introduced. The market is assumed to consist of a syndicate of dealers, where each dealer sans collusion, considers the expected present value of his investment plans, conditionally; that is, given that no other dealer has previously uncovered a selling advertising-product combination. If no coalitions are expected, the market can be thought of as a finite set of pairs of dealers each engaged in a potentially zero sum game.

The i^{th} dealer does not know which of n competitors may break through. However, he knows that if preemption occurs, it doesn't matter how many others follow. Consequently the syndicate of art dealers can be analyzed in terms of classical duopolistic reactions.

The classical expectational model shows that, in the absence of externalities (in whom they have invested and for whose acceptance they have tried to develop a consumer technology by investing k_i,k_j dollars.). By modifying the expectational duopoly model so as to include externalities, one reaches the conclusion that if the deterministic part of the net return to investment function is convex (from below) than an equilibrium market solution of optimum: k^*_i k^*_j may not exist (though clearly individual solutions of k^*_i for given k_j, held constant, exist). On the other hand, solutions are assured if all deterministic functions are concave or at least have inflection points (empirically the most common case).

The last formal section analyzes the probable behavior of dealer syndicates assuming that the extended expectational model correctly describes the environment in which dealers operate. Unlike many other product markets, art is not constrained by legal patents, franchises or exclusive access to resources (except occasionally) or secret technologies. Dealers can hedge their bets by choosing to recycle art for which the consumer technology was developed elsewhere (often in other countries where development costs are lower.) Even a dealer who has lost the race may realize positive returns to k_j under an appropriate umbrella. Syndicate behavior insures positive-sum games. Moreover, total investment in consumer technologies tends to exceed that of the classical expectational model, owing to the fact that losses can be partially recouped in the recycling market.

1. Consumer Technologies

The complex process whereby new consumer technologies are formed in art does not easily lend itself to traditional regression analysis. Thus one must resort to a method sometimes referred to as phenomenological; that is, a selective narrative and anecdotal documentation. First one notes that, contrary to some popular newspaper accounts, arts markets are not openly manipulated. Museum curators face the same uncertainties as do art buyers. Henry Geldzahler, the New York Metropolitan Museum's Fac-Totum on the art of the sixties, is reported to have said "I'm always asked, What's going to happen next in art, and I usually paraphrase what Bob Rauschenberg once said: I don't know, but I hope I'm in it. What I say is, I don't know, but I hope I'll recognize it." When the primary seller, the artist, makes his decision to develop new concepts in art, he relies on secondary sellers, that is, the organized dealers - or a few visionaries - to develop the consumer technology. Secondary sellers may realize considerable economies of scale.

To further illustrate this point, consider the race for high mileage compact cars. The consumer technology, namely, the mapping of Lancastrian characteristics of "compactness" into a utility vector was clearly present. The Japanese and some Europeans who were winners in the research and development race took the spoils, the losers, Chrysler and Ford, receded. This game in its initial stages was clearly zero sum. A different set of circumstances exists in art markets. Some of us passed by billboards made by Warhol, Rosenquist and others in the pre-pop days, not recognizing the presence of art. Thus absence of a consumer technology is tantamount to a denial of characteristics of "decorativeness" as well as those of "intellectual appeal."

An early nineteenth century Meissen figurine, made from the original Kaendler molds and from identical hard paste, decorated with the same loving care as its early eighteenth century prototype may indeed possess the same characteristics of "decorativeness" but dissimilar "intellectual appeal." It is the latter which causes the market to value the 19th century piece in the hundreds while the 18th century figurine easily commands a price of $20,000 $30,000.

It is customary in secondary art markets for major dealers to initially pre-empt all or most of a new art movement's or school's output and in this manner obtain the equivalent of (possibly temporary) patent rights. Such was the case when Sidney Janis and Leo Castelli pre-empted "pop" in New York, or when Denise Rene pre-empted "op" in Paris.

The leading dealers are short-lived monopolists who subsequently sub-contract or license the patent to other dealers, by distributing graphics, arranging for shows, etc. In this manner the leading dealers, who have developed the consumer technology and thus have become identified with the prominent artists of the school, hold an umbrella over the competitive fringes of the secondary art market. (The art establishment legitimizes and enforces those patent rights by failing to recognize new primary entrants from the unorganized market).

One tends to think of the Nash-type games played by art-dealers as a specifically American market phenomenon of the hyped years of the 1950's on to the 1980's. Such is not necessarily the case. There always was much orchestration of consumer technologies by secondary sellers, in spite of the mythology of the "starving" artists of the early 1900's, among whom one hears mentioned Picasso, Matisse and other household names. The records show that as early as 1914 continental art was handled by several galleries in the U.S.: Bourgeois, Coady's and Zaya's[3]. An incipient consumer technology for the "shock of the new" art was methodically developed by the Carroll galleries in several shows subsequent publicity, beginning March 2, 1914. In January, 1915, several Picassos were sold to the influential collector, John Quinn. By May, 1916, the consumer technology was firmly established even though it still operated in thin markets. Picasso's "Two Nudes" sold in 1915 for $1,044.53, Brancussi's "The Kiss" sold in 1916 for $1,048. Matisse's "Blue Nude" was purchased in 1920 by Quinn from Zaya's for $4,500. Picasso's "Reclining Nude" in 1923 fetched $5,738, and "La Toilette" sold for $5,375. Laurencin's "Women in the Forest" was purchased from Roche in 1920, for $1,183.(1)

These prices are no less spectacular in purchasing power equivalents than contemporary first public sales of Warhol's or Rauschenberg's nor was the gestation period from the dawn of Cubism to the monetization of a consumer technology longer than the current average of about 8 years.(2)

Dealers are aware of the fact that much establishment art is subject to exponential decay thus they continuously search for new artists, which requires development of new consumer technologies(3). In addition, dealers must realize that if any one of them makes a considerable investment in the production of a new consumer technology, other dealers may coopt artists with similar styles and thus, in effect, become free riders. Public records confirm the foregoing. It was noted by John Hess that "Representational art was in, then out, then in again. Abstract expressionism was in, then out; pop was in, then out... It seems that pop art was an episode. That meant that Warhol was out..." Hess also recalls an amusing incident: when Geldzahler left Warhol out of the selections for the 1966 Venice Beinnale, Geldzahler wrote on a blackboard in Warhol's studio: "Andy can't paint anymore, and he can't make movies yet."[4]

The probability that a specific dealer will succeed in developing a new consumer technology in a finite time interval, depends on the dealer's reputation. This is based on his past performance; namely on the dealer's ability to get new consumer technologies accepted by the art establishment (influential collectors, museum curators, art publishers and critics). Some art dealers may sell out to established dealers, capable of helping them gain acceptance of new consumer technologies, promoted by them. Artists, too, may forsake their initial dealers if they believe another dealer or a combination of dealers can help develop a consumer technology which would make their works more readily acceptable to the art establishment. No lesser artist than Mark Rothko was persuaded to relinquish his ties with the highly regarded avant-garde gallery of Sidney Janis in favor of an emerging inter-national conglomerate, Marlborough Enterprises, headed by Frank Lloyd. This occurred in spite of the fact that Rothko deeply resented the art establishment and knew that unlike Janis, Lloyd had very little or no appreciation for his art. Search for minimum development costs for consumer technologies has internationalized art markets, with many native American "schools" having first gained acceptance offshores.

A less familiar subject than consumer technologies for new artists is rediscovery. Both in the U.S. and in Europe dealers are exerting substantial efforts to focus "intellectual appeal" on 19th century art which a previous generation of art dealers successfully discredited. In Europe some Barbizon School artists, Millet and others, whose works in the 1950's averaged $11,562 (with a standard deviation of $2,318) were 10 years later attaining records; $600,000 was paid for the "Gleaner" at Sotheby (Sale 4161, lot no. 179). The 1980 mean for this group is $85,621 (in dollars of equivalent purchasing power). Clearly such advances could not have been achieved without a dealer-sustained consumer technology, in this case directed towards rediscovery.

An even more striking example is the concerted effort by a few dealers to elevate some American impressionists such as Maurice Prendergast and William Merritt Chase. These artists painted twenty to thirty years after the French had invented impressionism. Unlike the path-blazing New York schools of the fifties and sixties, American impressionists who populated second and third rate auction houses, were regarded as epigones. They are not even now accepted by the museum establishments. Yet on May 29, 1981 John E. Parkerson, a Houston dealer (originally an American art expert with Sotheby) paid $820,000 for a Chase pastel and $410,000 for a Prendergast water color. Several such efforts to engage collectors in a new consumer technology can be cited. This caused critic William Kingland to write in Art & Auction[5]: "the boom in American paintings appears to continue amid doubts as to its solidity ... some collectors are made uncomfortable by what they perceive to be the driving up of prices by a small number of dealers and their clients." There is, of course, the problem of dissemination of information. Jack Hischleifer[6] distinguishes between foreknowledge and discovery. Foreknowledge is exemplified by the ability to predict the future, which nature reveals. A dealer may have foreknowledge that a museum curator is supportive of a hitherto unknown artist. The dealer may subsequently purchase an inventory of the artist's works and commit a gallery exhibition schedule with concomitant publicity. The dealer is clearly making a judgment associated with the uncertain event that the artist will continue to please museum curators. Their imprimatur will generate characteristics of decorativeness and intellectual appeal, which already exist but are hidden from view and can only be laid bare by human action.

It is the latter, namely, discovery, which is associated with the development of consumer technologies. Hirschleifer's model tends to conclude that if such information remains private its effects are purely redistributive and there is an incentive for individuals (i.e. dealers) to expend resources in a socially wasteful way in generating such information (i.e. consumer technologies.) There is nothing in the sequel that would contradict this thesis.

1. The Expectational Model

The present model draws on the R & D literature with one crucial distinction; namely while the literature takes Revenue, R, for which firms compete as given, the present model considers the demand-augmenting aspects of new consumer technologies. In other words, the art market is a positive sum game.

Suppose, the probability that an investment of k dollars in a new consumer technology, given that the dealer has uncovered an artist or artists, at or before time, t, can be denoted by

$$(1) \qquad P\,[\,T(k_i) \leqslant t\,] = 1 - e^{-m(k_i)t}$$

where k represents commitment or budgeting of a continuous flow: $m(k_i)$. This generates a family of curves each with an $E(t/k_i)$ and which may be assumed to be a strictly increasing twice differentiable function with an inflection at $k > 0$ such that $m(0) = 0$; $m''(k) > 0$ for $k < k$, $m''(k) < 0$ for $k > k$. Clearly, the expected time for the consumer technology to be ready for the i^{th} dealer's artists' is $1/m(k_i)$. We can also assume that other dealers are equally anxious to introduce consumer technologies for these artists and that rival dealers believe that whoever gets acceptance of an "in" school by the art establishment will gain considerable advantage over competitors. Let the probability that a rival dealer or dealers will succeed in getting a competing consumer technology accepted by the art establishment, be,

$$(2) \qquad P\,[\,T(k_j) \leqslant t\,] = 1 - e^{-n(k_j)t}$$

This can be normalized into a duopoly problem, by focusing on min. of t_j among n(t); that is, by concentrating on the principal rival representing all rivals. Then, $m(k_i) = K - n(k_j)$, where K is the capital stock committed to developing a consumer technology. The conditional probability that the i^{th} dealer investing k_i dollars in a new consumer technology will succeed at times $T \leqslant t$, given that rival dealers have not previously succeeded in establishing the particular consumer technology into which k_j dollars was invested is,

$$(3) \qquad P(m, n) = \frac{m(k_i)}{n(k_j) + m(k_i)} \left\{ 1 - \text{EXP.}\,[-(m+n)t] \right\}$$

From the i^{th} dealer's point of view, the present value of expected profits must be maximized over k_i given n and k_j; namely,

(4) $$\frac{R(K)\, m(k_i)}{n(k_j) + m(k_i)} \int_0^{\infty} (1 - e^{-t(m + n)}) e^{-rt}\, dt$$

We are here only interested in the present value of a fixed investment not including a variable cost flow, as in Lee and Wilde [7].

In order to simplify notation, we write m and n for $m(k_i)$ and $n(k_j)$ and R for $R(k_i, k_j)$. We now let $t \rightarrow \infty$ in (4) and define the maximand as net present value; namely,

(5) $$\Pi = \underset{k_i,\, k_j}{\text{Max.}} \quad \frac{Rm}{n + m} \left(\frac{1}{r} - \frac{1}{n+m+r}\right) k_i$$

(5a) $$\Pi = \text{Max.} \quad (k_i,\, k_j) \quad \frac{Rm}{r\,(n+m+r)} - k_i$$

R is strictly concave in k_i, k_j. Differentiating with respect to k_i one obtains

(6) $$\Pi_1 = \frac{(mR_i + m_iR)\ [r(n+m+r)] - Rm\ (rm_i)}{r^2(n+m+r)^2} = 1$$

Where the subscripts denote partials with respect to i or j. Simplifying and dividing throughout by R, we obtain,

(7) $$\frac{R_i/R\ [m(n+m+r)] + m_i(n+r)}{(n+m+r)^2} - \frac{r}{R} = 0$$

Differentiating (5) with respect to k_j setting equal to zero and rearranging one obtains,

(8) $$(n+m+r)\ R_j m = Rmn_j$$

Dividing throughout by mR, we have,

(9) $$n_j = (m+n+r)\ R_j/R$$

An interior solution is assured in the range where $n_{jj} \leqslant 0$ that is for $k_j > k$ (diminishing returns for k). If the prize, R, at stake is fixed, one obtains the simple solution, known from R & D analyses [8] ; namely,

(9a) $$\frac{m_i\,(n + r)}{(n+m+r)^2} = \frac{r}{R}$$

On the other hand, if $n_j > 0$, which is likely in art markets where new consumer technologies are developed, because of the powers of osmosis, then (9a) is expanded by the term $\frac{m}{M}(R_j/R)$ where $M = (n+m+r)$. Similarly, each of the j rival art dealers will have their decision functions expanded by a term $\frac{n}{M}(R_j/R)$. It is reasonable to assume that new consumer technologies would raise expected revenues. Thus, each dealer would be willing to increase his or her investment in response to rivalry by other dealers. In this manner all dealers would attain the same level of protection against new entrants. There is considerable evidence of such phenomena in recent trades. In 1959 Rothkos were unsalable at $150 apiece, while even minor non objectives sold in four figures. Ten years later in 1969, when a closely related "color field" technology was developed, Marlborough bought 105 Rothkos for $1,476,000. Today, at full development of the relevant consumer technology the 105 Rothkos are worth about 8 million [9]

Substitution of (9) into (7) gives,

(10) $$\frac{[(n+r)m_i]\ R^2}{(n+m+r)^2} - rR + (m/n)\,(R_iR_j) = 0$$

Equation (10) constrains the maximum net present value of k_i dollars invested in a new technology for given rival investments k_j and given strictly concave functions, $m(k_i)$, $n(k_j)$, $R(k_i,k_j)$

For optimal k*(i) and k*(j), R from (10) satisfies

$$(12) \qquad R = \frac{r \pm \sqrt{r^2 - 4m(R_iR_j)(n + r)\ m_i/M^2 n_j}}{2[(n + r)\ m_i/M^2]}$$

Thus, for an interior solution other than at max. k_i, max. k_j, we must have, k^*_i and k^*_j which by substitution into R_i, R_j will satisfy the inequality,

$$(12a) \qquad r^2 \geqslant 4\ m(R_iR_j)(n + r)m_i/n_jM^2 = Q$$

(12) is always satisfied if $R_i < 0$ or $R_j < 0$. Moreover, for positive R, we must have, by substitution into, (5a),

$$(12b) \qquad m\ \frac{[r + \sqrt{r^2 - Q}]}{2(n + r)\ m_i} - rk^*/M > 0$$

In the region where (12b) does not hold the Cournot-Stackelberg optimization process which iterates towards k^*_i and k^*_j cannot be carried out. Starting from a position of zero; namely, absence of a consumer technology, nothing is to be gained from either "conjectural variation" nor from cooperation (Π_i and $\Pi_j = 0$ do not yield a common optimal positive industry R for distribution among the i and j).

On the other hand, if either R_j or R_i is zero, which is the case where either k_i or k_j is taken as given by the competitors, condition (12b) reduces to;

$$(12c) \qquad m(n + m + r) - k^*\ (n + r)m_i > 0$$

Where m and n are average products of capital while m_i is the marginal product of k_i in developing a consumer technology. This makes positive profits depend on m_i, alone and not on the degree of rivalry n_j (new entrants). Thus, for given n, that is, for a constant number of firms, positive profits depend only on the ability of the firm to achieve a breakthrough first, namely on the efficiency of the firm's strategies, $m(k^*_i)$. On the other hand, it is reasonable to assume that either R_i or R_j or both are greater than zero because new consumer technologies are likely to be demand-augmenting.

One notes that because of externalities the winning dealer reaps the benefits of not only his investment of k_i but also of the competitor's k_j which has contributed to development of a consumer technology. The j dealers can recycle the art for which a consumer technology has been developed - by buying from collectors and auction houses in the open market. This process contains the net profits of the leading dealer. On the other hand, recycling allows the j dealers to participate in the consumer technology which their k_j dollars had helped develop. Thus there is a floor on their losses. Moreover, owing to the fact that this is well-known to all market participants, the positive sum game can be optimized by syndicate behavior. We define a syndicate as in Okuno-Postlewaite; namely, "a collection of non-significant groups of traders who coordinate their actions within respective groups." This situation does not preclude the existence of an unorganized portion of the market who act individually. "The key point is that the members of a syndicate act in concert in deciding on the common trades they will make."[10]

3. Model with Syndicates

Figure 1 indicates the relevant functions. We note that marginal revenue along a vertical slice of the half open solid $F[R, k_i, k_j]$ is first rising and subsequently declines. Assuming strict concavity and convexity throughout a unique optimum may exist as in Fig. 1. Under more relaxed conditions such may not be the case. Rather, a feasible region for optimization may exist as indicated in the hatched area in Fig. 2, in the k_i, k_j place. The rational approach appears to be for a group of traders; namely, a syndicate to each invest in a consumer technology with the understanding that those who break through (mostly because they have uncovered the right artists for the time at hand) will then permit the other members of the syndicate to recycle the works. Recycling arrangements can take a number of different forms. For example, follower dealers may pick up a few less innovative members of the "school" and obtain the support of the leading dealer to include such lesser luminaries in shows, with their imprimatur. Leaders may ration to followers purchase rights of artists held in stock. Multiples and graphics may be

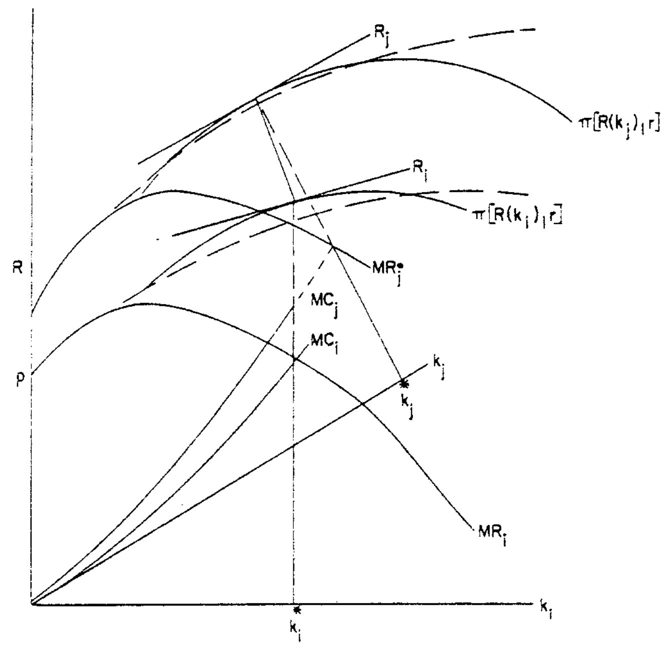

Fig. 1

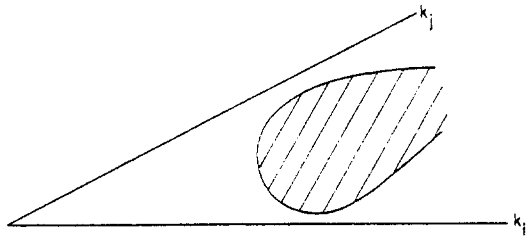

Fig. 2

rationed within the syndicate, etc.

Thus consider the response functions of members of syndicates. Define K $= k_j + k_i$; $dK = dk_j + dk_i$. We write,

$$(13) \qquad e_{ij} = (dK/dk_i) / (k_i/K) = (1 + \frac{dk_j}{dk_i}) \frac{k_i}{K}$$

If $dk_j = 0, e_{ij} = 1; K = k_i$

We may view e_{ij} as the elasticity of rivalry (by existing firms). In other words if $e_{ij} > 1$, secondary sellers will compete for a share of the market established by a new consumer technology in response to the i^{th} seller's move in that direction. Such would be the case if the i^{th} dealer broke through with a new consumer technology, say photo-realism, and other dealers "recycle" similar works so as to establish themselves in the new markets. The i^{th} dealer's sales can be thought of as "vintage" sales, with the others looked upon as secondary sales similar to what occurs in, say, the aluminum industry[11]. We may note, however, that unlike R & D models we cannot assume secrecy and consequently absence of economies of scale or free ridership. Next, we define

$$(14) \qquad e = \frac{dK}{dp} \cdot (\frac{d}{K}), \text{ where } p = \Pi/K; \; e \gtrless 0$$

Π is as defined in (5) above, p is the rate of return on K; p performs the same function as price and K is equivalent to q in conventional elasticity. Moreover, we have,

$$(15) \qquad 1/e = \frac{dp}{dK} (\frac{K}{p}) = \frac{dp}{dK} \cdot (\frac{k_i}{p}) + \frac{dp}{dK} (\frac{k_j}{p})$$

Next we define, e_i and e_j as elasticity of entry (by recyclers attracted by $p > 0$) as the proportionate investment induced by a proportionate change in realizable rates of return,

$$(16) \qquad e_i = \frac{dk_i}{dp}\left(\frac{p}{k_i}\right) \text{ and } e_j = \frac{dk_j}{dp}\left(\frac{p}{k_j}\right)$$

We must note that e_i, e_j may each have a positive range where dk_i/dp and $dk_j/dp > 0$. This inequality will be normally reversed as more consumer capital, k_i, k_j is drawn into the market.
Substitution of (16) into (15) yields,

$$(17) \qquad \frac{1}{e} = \frac{dk_i}{dK}\left(\frac{1}{e_i}\right) + \frac{dk_j}{dK}\left(\frac{1}{e_j}\right)$$

Namely a weighted elasticity of entry.
We define $MR = d\Pi/dK = d(pK)/dK$; which, given a continuous inverse demand function, $p = p(k_i, k_j)$, can be written as,

$$(18) \qquad MR = p(1 - e_{ij}/e);$$

The marginal return, $MR > 0$ if,

$$(19) \qquad \left(\frac{1}{e_i}\frac{dk_i}{dK} + \frac{1}{e_j}\frac{dk_j}{dK}\right)\left(1 + \frac{dk_j}{dk_i}\right)\frac{k_i}{K} < 1$$

The second term in (19), e_{ij} is certainly greater than one, thus the left hand term must be smaller than one.

This is a seemingly unusual result because it implies that $MR < 0$ if entry is inelastic and $MR > 0$ if entry is elastic. On further examination one notes that as e_i, $e_j \to \infty$, the syndicate dissolves and a competitive market ensues.

An interesting situation arises when $dk_j/dk_i < 0$. That is, if rivals reduce their outlays on the development of new consumer technologies as the i^{th} seller increases his expenditures. Such would be the case if two syndicates of competing dealers were willing to accept the leadership of an established dealer who had a record of successful introductions of new consumer technologies. In this event, as dk_j/dk_i approaches -1, MR approaches AR.

However, as is clear from (5a), (6) and (9), this implies that neither k_i nor k_j can impact R. In other words, we have a zero sum game. As the new consumer technology enters the public domain, e goes to infinity and the returns to investment or profits go to zero.

In the classical Cournot-Stackelberg model both AR and MR are declining functions of k_i, holding k_j constant. In the present model this is not necessarily the case because of the demand-augmenting effects of new consumer technologies. We can demonstrate this property from the definition of p in (14) above, differentiating totally, thus,

$$(20) \qquad K^2 dp \gtreqless 0 \text{ as } K({}_i dk_i + {}_j dk_j) - \Pi dK \gtreqless 0$$

Π_i, Π_j indicate partials. Owing to the fact that Π is a strictly concave function of k_i, k_j, $dp < 0$ for finite K. Thus, while for some k_i, k_j, MR as defined in (15) may have an upward ratchet-like movement, the function will ultimately behave in the more usual manner, moreover,

$$(21) \qquad MR \gtreqless AR \text{ as } dp \gtreqless 0$$

So far I have not touched upon the case where $\Pi_i \, \Pi_j \leqslant 0$; and, or either R_i. $R_j \leqslant o$; that is, where successive investments of k_i, k_j fail to produce a viable consumer technology. Such cases clearly exist. However, owing to the fact that several syndicates are engaged simultaneously in developing consumer technologies, inter syndicate as well as intra syndicate externalities exist. The market always thirst for the "new," though it may not select or adopt all movements at the same time, or even ever. Failing syndicates tend to join successful ones as recyclers if their expected net present values are negative. Consequently, unlike the conventional duopoly-oligopoly case, investments which fail to yield positive returns or cover their opportunity costs in one market; namely, the vintage market, are salvageable at least in part, by transfer to the recycling market. Consequently, other things equal, investments in new technologies will tend to be higher in art as compared to other product markets. This in part explains the continuous vitality and buoyancy of art markets, with no single dealer (or group of dealers) able to hold a monopoly position as $e_j \to \infty$.

Summary

As is the case with other field theories, Urban Economics, Environmental Economics, etc. the microeconomics of the arts attempts to derive a set of particular propositions from the general propositions of Economic Theory. In the process a substantial amount of cross-fertilization takes place. The specific characteristics of art markets require modification or amplification of some general propositions of economic theory, which in turn may offer novel and possibly useful insights as well as testable hypotheses. The following propositions appear to emanate from the present paper.

In general markets R & D efforts are directed towards product or process innovation. For the most part, a known consumer technology exists. Innovation in art markets involves product creation as well as the creation of a consumer technology capable of deriving satisfaction from consumption of the new product. In open markets, a non-patentable product would entail excessive free ridership. Such a state of affairs may discourage innovation. Primary sellers would tend to adapt to narrowly changing consumer technologies. Such was the case during most of art history up to the late 19th century. At present, museums and art critics act as quasi patent offices, which fosters innovation by assuring a positive sum game.

A new consumer technology is expected to be demand-augmenting. Not necessarily in the sense of McCain [12] where discontinuous jumps in demand are postulated. Even if such shifts were to occur in individual demand curves, market demand will nevertheless be continuous. The present model presumes that the augmentation is mostly due to increasing numbers of art buyers entering as the new consumer technology causes substitution of one style for another (or one fad for another). Syndicate behavior is induced by the winners of the race who have successfully established a new consumer technology and subsequently extend an umbrella over the membership. In this manner the spoils are shared more equitably. This is a peculiarly modern phenomenon. In the past one could not put a Teniers above a Rembrandt or a Polidoro above a Raphael. The generally accepted rules of decorativeness, that is, craftmanship and composition were obvious and immediately perceptible by all.

In certain instances syndicate behavior favors single leadership by an established dealer, or a small group of dealers with a proven track record in spawning new technologies. Collectors, too, are involved, by overpaying for art. The discovering collector creates entry barriers for other collectors and thus has a monopoly of discovery of purely "intellectual appeal" art. Followers may opt to reduce their rivalry in exchange for assurances that once the new technology is in place, they will be given the opportunity to recycle the art brought into being by the leader or leaders. Under certain conditions, as analyzed in the foregoing, this constitutes an optimal strategy.

As in the classical case, entry reduces investment and drives rents to zero, if each firm invests a roughly equivalent amount in support of the prevailing consumer technology. There arises the limiting case, equivalent to pure competition (see EQ. 10). On the other hand, several counterveiling strategies are possible. For example, overpayment, as in the case of Rothko. This limits the artists' output in the market. Leftover art is donated or acquired by museums. Such art is no longer competitive, as opposed to art held by other collectors, which, diminishes art's *scarcity* value.

The most probable outcome of a Cournot-Stackelberg type behavior is a succession of leader-follower or leader-recycler type syndicates, each successively dissolving as new consumer technologies replace old ones. It is, of course, possible for several specialized syndicates to operate contemporaneously. The rate of turnover clearly depends on the speed of dissemination of information. The curator, critic, trustee, consultant has a vested interest in episodic art and in spawning new consumer technologies: if this were not so, there would be no need for the pre-eminance of the critic. He is the magician, the priest, the medicine man who "knows" the secret language and penetrates the mysteries.

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REFERENCES

[1] Leslie Singer, "Microeconomics of the Art Market," *Journal of Cultural Economics*, 2, 1978, pp. 21-39. "Supply Decisions of Professional Artists," *American Economic Review*, 71, 1981, pp. 341-346.

[2] John L. Hess, *The Grand Acquisitors*, New York: Houghton Mifflin, 1974, p. 97.

[3] Judity Zilczer, *"The Noble Buyer:" John Quinn, Patron of the Avant-Garde*, Washington, D.C., The Smithsonian Institution Press, 1978, also Archives of American Art in the Smithsonian Institution and Manuscripts and Archives Astor, Lenox and Tilden Foundation, New York Public Library.

[4] Hess, *Ibid.* p. 96.

[5] *Art & Auction* 4, 1981, pp. 52, 53.

[6] Jack Hirshleifer "The Private and Social Value of Information and The Reward to Inventive Activity," *American Economic Review*, 61, 1971, pp. 561-574.

[7] Tom Lee and Louis L. Wilde, "Market Structure and Innovation: A Reformulation," *Quarterly Journal of Economics*, 44, 1980, p. 431.

[8] M. Kamien and N. Schwartz, "Timing of Innovations Under Rivalry," *Econometrica*, 40, 1972, pp. 43-59 and "On the Degree of Rivalry for Maximum Innovative Activity," *Quarterly Journal of Economics*, 40, 1976, pp. 245-60.

[9] Malborough records and Hess, *Ibid.*, 116-119, also Jacob Kainen's testimony in Rothko estate hearings.

[10] M. Okuno, A. Postlewaite and F. Roberts, "Oligopoly and Competition in Large Markets," *American Economic Review*, 70, 1980, pp. 22-31.

[11] P.L. Swan, "Alcoa: The Influence of Recycling on Monopoly Power," *Journal of Political Economy*, 88, 1980, pp. 76-99.

[12] Roger A. McCain, "Reflections on the Cultivation of Taste," *Journal of Cultural Economics*. 3, 1979, pp. 30-52, also, *American Economic Review*, 71, 1978, pp. 332-334.

FOOTNOTES

* I appreciate insightful comments by Roger McCain.

(1) Works cited are in museums and public collections, the Museum of

Modern Art, Philadelphia Museum of Art, Baltimore Museum of Art, Musee Georges Pompidou, Albright-Knox, Buffalo, N.Y., Armand Hammer. Acquisition prices are from the catalogue completed by Zilczer from 6 primary sources.

(2) A study is currently in progress by the present author of the U.S., British, French, German and Danishart markets, covering the period from 1900-1970. Preliminary results indicate, among others that the art dealers consciously invest in new consumer technologies and that the mean gestation period is 8.31 years with a standard deviation of 2.13 years.

(3) None of the galleries mentioned are in the forefront of current consumer technologies; the original advantage the galleries had vanished as works became recycled in the competitive fringe. Such was not the case in Europe where Kahnweiler continued as the leading innovative dealer.