

Entrepreneurship and Microeconomics

A review of Industrial Organisation theory

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ABSTRACT

The author examines a recently published, highly-regarded textbook on industrial economics in order to determine the extent to which the discipline of industrial economics is relevant to the theory and practice of entrepreneurship. The areas examined include the definition and the role of the entrepreneur and the impact of entrepreneurs upon the general welfare, the relationship between price and demand, the typical cost structure of a business, and the extent and significance of marketing expense and investment. The author concludes that industrial economists appear to ask the right questions, but because of a difference in perspective and the use of excessively simplified assumptions they do not come up with the correct answers.

INTRODUCTION

Ethical entrepreneurs create enterprises that commercialise innovations. By doing so they generate wealth, only a fraction of which they harvest personally. When the term ethical entrepreneur is taken to embrace "intrapreneurs", product champions who drive new initiatives from within established organisations, it can be reasonably argued that virtually all growth in *per capita* incomes since the late eighteenth century has involved the practice of entrepreneurship.

Microeconomics claims to be the study of industries, and the naive might not think it unreasonable to expect the microeconomics text books to discuss the manner in which new firms and industries are founded. An examination of the text books and professional journals in which orthodox "neoclassical" microeconomics is expounded and developed dashes such hopes. Economists have noted this: Baumol, for example:

. . . Look for [the entrepreneur] in the index of some of the most noted recent writings on value theory, in neoclassical or activity analysis models of the firm. The references are scanty and more often they are totally absent. The theoretical firm is entrepreneurless—the Prince of Denmark **has** been expunged from the discussion of *Hamlet*.

It is not difficult to explain his absence. Consider the nature of the model of the **firm**. In its simplest **form** (and in this respect we shall see that the more complex and more sophisticated models are no better). . . Explicitly or implicitly the firm is. . . taken to **perform** a mathematical

calculation which yields optimal (i.e., profit maximising) values for all its decision variables. . . (Baumol 1968: 51–52)

There is one residual and rather curious role left to the entrepreneur in the neoclassical model. He is the indivisible and non-replicable input that accounts for the U-shaped cost curve of a firm whose production function is linear and homogeneous. How the mighty have fallen! (Baumol 1968: footnote p. 52)

Innovation is as rare as entrepreneurship in standard neoclassical theory, a theory which is above all a theory of competition between established suppliers of standardised products. In standard neoclassical expositions, innovators and entrepreneurs are as likely to be damned as monopolists as to be welcomed as the providers of new goods and services and the developers of new means of production and ways of serving markets. Neoclassical theorists deal almost exclusively with equilibrium situations, markets and economies where the most recent innovations lie in the distant past, where purchasers, suppliers and financiers act by applying perfect logic to complete information, and where the only significant problem is achieving a perfect allocation of a limited set of resources.

A sub-discipline of economics known as Industrial Economics, or Industrial Organisation Theory, takes the neoclassical approach, but avoids some of the more extreme assumptions from the elementary textbooks. Industrial economists recognise that markets are not perfect, since many markets are supplied by a limited number of firms whose actions can influence the price and whose rational managers may take steps to limit their output. IO theory deals with differentiated products, advertising and research and development, and includes among its practitioners some highly pragmatic researchers.

If orthodox economics is to offer any practical assistance to the theory and practice of entrepreneurship, then IO theory would seem to be a good place to start looking for it. The author looked in Martin (1993), a work that was recommended as being recent, comprehensive and undogmatic.

If the orthodox approach is finally rejected, there are heterodox schools of economics in which better explanations for industry formation and firm behaviour may, perhaps, be found. Three of these are very briefly outlined below, but they are not taken into account in the body of this paper.

Some leading economic theorists have med to broaden the boundaries of neoclassical orthodoxy. Paul M. Romer is generally credited with the creation of New (or Endogenous) Growth Theory, a set of extensions to the standard neoclassical model in which innovation can occur and produce economic growth. Romer points out that knowledge is not limited in the sense that physical resources are: a single diskette holds about twelve million bits, enough to define $10^{4,000,000}$ different programs. This number is large enough to be treated as infinite for all practical purposes, and demonstrates that there is no practical limit on knowledge-based resources. Romer showed that a theory, such as the orthodox neoclassical model, that interprets all economic activity in terms of dividing a fixed amount of resource among competing agents, will not describe markets in knowledge-intensive products satisfactorily.

W. Brian Arthur (1990) criticises the standard model from a different perspective, pointing out the **impossibility** of any real human being writing out, much less solving, the equations which the neoclassical model presumes that every entrepreneur solves continuously, effortlessly, and costlessly. Arthur is a leading member of the Santa Fe Institute, an American foundation that concentrates on research into complex systems, and particularly into the way in which interacting systems can demonstrate behaviour that no amount of study of the individual components would have predicted (Waldrop 1992). Stuart A. Kauffman is another associate of the Santa Fe Institute. Kauffman recently published an account of evolution based wholly upon complex system theory (1993), and the evolution of complex biological systems has some obvious analogies with the development of human economies.

The analogy **between** economic and ecological development goes back to the foundation of economics, with Mandeville's Fable of the Bees from the eighteenth century. Darwin's theory of natural selection, later described as the "survival of the fittest" in order to increase its appeal to nineteenth century British opinion leaders, gave this analogy a boost. A number of economists describe their speciality as "evolutionary" economics and describe economic selection mechanisms, and their effects, in order to explain the development of firms and industries (Langlois and Robertson 1994; Nightingale 1993).

A consideration of the relationship between New Growth Theory, Complexity Theory, Evolutionary Economics, and entrepreneurship is deferred to another paper. The balance of this one deals with entrepreneurship as it fits, or does not fit, into the orthodox neoclassical model and its IO extensions.

ENTREPRENEURS

The word "entrepreneur" has two distinct meanings in contemporary English, both of which are reflected in the economics literature. Kirzner (1982) interprets entrepreneurship as a search process: this class of entrepreneur discovers, and profits from, imperfect **information** in a market system. Essentially, Kirzner's entrepreneur discovers that there are, somewhere, sellers who are charging less than the true market price for some commodity and somewhere else there are buyers who are paying more. This person contracts to buy cheap and sell dear; his profits attract other "entrepreneurs" who pay more and sell for less, and at the end of the process the imperfection in the market has been erased. The practice of such "entrepreneurs" tends to be less benign than a reader of Kirzner might imagine, particularly when the defect in market knowledge is **introduced** by the "entrepreneur" in **the** first place. Ordinary people tend to call such people spivs and swindlers, but they call themselves entrepreneurs and, at least before the facts catch up with them, their sycophants in the press often use the same term.

Schumpeter (1934) defined the entrepreneur as an innovator, whose initiatives lead to economic development and social progress:

This concept [innovation] covers the following five cases: (1) The introduction of a new good — that is one with which consumers are not yet familiar — or a new quality of good. (2) The introduction of a new method of production, that is one not yet tested by experience in the

branch of manufacture concerned, which need by no means be founded upon a discovery scientifically new, and can also exist in a new way of handling a commodity commercially. (3) The opening of a new market, that is a market into which the particular branch of manufacture of the country in question has not previously entered, whether or not this market has existed before. (4) The conquest of a new source of supply of raw materials or half-manufactured goods, again irrespective of whether this source already exists or whether it first has to be created. (5) The carrying out of the new organisation of any industry, like the creation of a monopoly position (for example through **trustification**) or the breaking up of a monopoly position. (Schumpeter 1934: 66)

While Kirzner's entrepreneur finds and exploits defects in existing markets for established products, Schumpeter's entrepreneur creates new markets and new products. It takes a great deal of mathematics and an even greater suspension of disbelief to come to the conclusion that society in general benefits by more than the victims lose once a Kirznerian entrepreneur has passed through. There is much less of a problem in detecting the social benefits created by innovators.

Suppose that automobiles and penicillin disappeared, and **electric** washing machines, refrigerators, disposable diapers, electricity, and television. Suppose indeed that every economically significant good added since 1900 disappeared, and suppose that the remaining items — salt **pick**, lard, houses without running water etc. — were marked down to 1900 prices. Would today's Americans then judge that their economic welfare had improved, or would they if anything conclude that they had derived more “**welfare**” from their material goods **than** their great grandparents did from theirs?

Consumers might, of course, [have] taken no pleasure in books once they saw television, but the array of available goods changes slowly. . . Twentieth century consumers could therefore usually choose last year's budget items this year if they desired. Yet real consumer expenditures rose in 70 of the 84 years between 1900 and 1984 as consumers continually switched to new goods. Such repetition reveals consumers behaving as if the newer goods did indeed yield more worthwhile experience. (Lebergott 1993: 51)

At the Centre for Innovation and Enterprise of the Swinburne University of Technology Schumpeterian entrepreneurs are referred to as “ethical entrepreneurs”, and this form will be used in the current paper.

PRODUCERS AND CONSUMERS

Orthodox Anglo-Saxon economics takes “**maximising** consumer welfare” as its primary objective. Consumer welfare is considered to be enhanced by an increased supply of “product” at lower prices. Most, but not all, orthodox economists hold that any attempts to adjust the distribution of income will reduce consumer welfare. Sloan, of the National Institute of Labour Studies in Adelaide, considers that an increase in inequality is necessary to increase welfare, and promotes her position vigorously through her column in the *Australian Financial Review*. Ethical entrepreneurs attempt,

by creating new enterprises built upon innovation, to adjust the distribution of income in favour of themselves and their employees while selectively increasing the welfare of their customers. Orthodox economists tend to deprecate the profits earned by the ethical entrepreneur as "monopoly rents" and suggest that consumer welfare would be increased if these "rents" were distributed to consumers as lower prices.

The probable effect of confiscating entrepreneurial profits would be to discourage entrepreneurs and to reduce the rate of innovation. This would not, in orthodox economic theory, reduce consumer welfare, although the New Growth Theorists suggest that suppressing innovation would reduce growth in per **capita** incomes, an effect inconsistent with increasing consumer welfare.

Students and practitioners of entrepreneurship consider the economy from the producer's point of view, although this point of view necessarily recognises the interests of consumers. After all, as **Lebergott** (quoted above) pointed out, consumers do not have to buy or use an innovation, since the superseded product will, in general, still be available. The innovator can only claim a profit after delivering a product (including services) with a net value that exceeds the net value of the products previously established on the market. As **Schumpeter** (1942) pointed out, the innovator, although a monopolist, delivers a better product at a lower effective price than had been available in any previous market, perfectly competitive or otherwise.

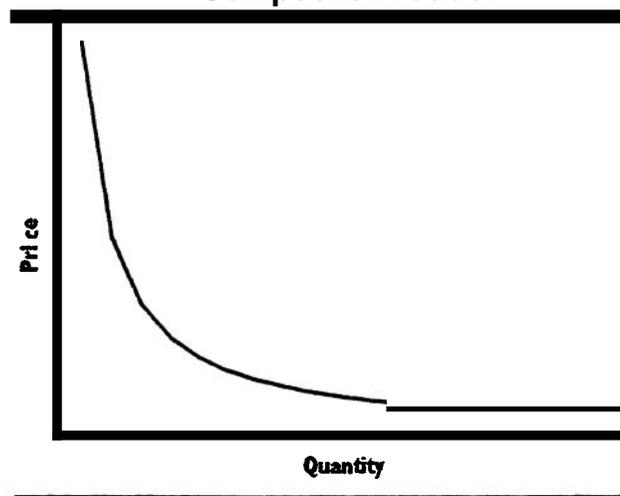
Industrial Economics, IO theory, does not appear to devote much effort to considering the effect of innovations, but is more concerned with the presumed attempts by suppliers of undifferentiated, or weakly differentiated, products to obtain excessive profits through overt or implicit collusion.

THE DEMAND CURVE

It is generally accepted that price affects demand: if a product was offered in two different, but comparable, markets at a different price it is probable that a different number of **units** would be sold in each market. In most, but not all cases, fewer units are sold where the price is higher. The *shape* of the demand curve, the relationship between the price and the quantity that can be sold, is clearly a matter of interest to economists and to entrepreneurs.

In the simplest case, there is only one product offered on the market, all of which must be sold, and the buyers have only a certain sum of money to pay for it, all of which must be spent. In this case, as shown in Figure 1, the demand curve is a right hyperbola, since the product of the price and quantity equals the total of the available money. To a first order, the demand curve across the whole economy should take this shape, since most of the available money is usually spent

Figure 1 Demand Curve for a Single, Composite Product



and most of the offered products are, usually, sold.

An hyperbola is not a good model of the demand curve for a single, well differentiated product, since it implies that a fixed amount of money will be spent on the product irrespective of its price, and moreover that as the price approaches zero the quantity demanded will approach infinity. In any definite period the sales of any real product will be limited by the fact that there are a finite number of possible purchasers, and each purchaser will want no more than a finite quantity. If the product is, for example, a ticket to a football match the market will be largely limited to the fans of the two competing teams, few if any of whom will want more than one seat.

Figure 2 shows a possible demand function for a unique product with appeal to a well-defined, finite population each of whom will require either one or no units of the product. This curve is based on a modified Hill

function $\left(q = \frac{1}{1+p^\epsilon} \right)$. Hill functions

have been shown to provide an adequate model of switching in a biological or biochemical population where there is a certain amount of positive feedback.

The **Hill** function model is appropriate when consumers are not choosing between similar products on the basis of a prior decision to buy one or the other, but where they are **making** a choice between buying a particular product, or a member of a **particular** class of product, or not. The use of such a model implies that consumers face a wide choice of products, that in any one period they will buy one unit or none of any particular variety, and that in any one period the number of varieties of which they buy none will substantially outweigh the number of varieties of which they buy **any**.

Economics text **books** tend to use a version of Figure 3, a straight line running from a finite price at which there is no demand to a zero price at which demand is at its maximum. This straight line "curve" is generally introduced as a matter of convenience rather than observation, but as the reader progresses through the text this reservation is gradually forgotten, and conclusions based upon this linear assumption are presented as if they were incontrovertible facts.

Figure 2 Demand Curve for a Unique Product Offered to a Finite Population

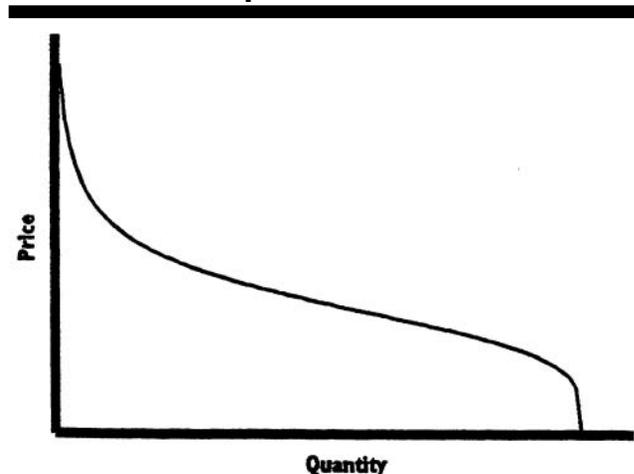
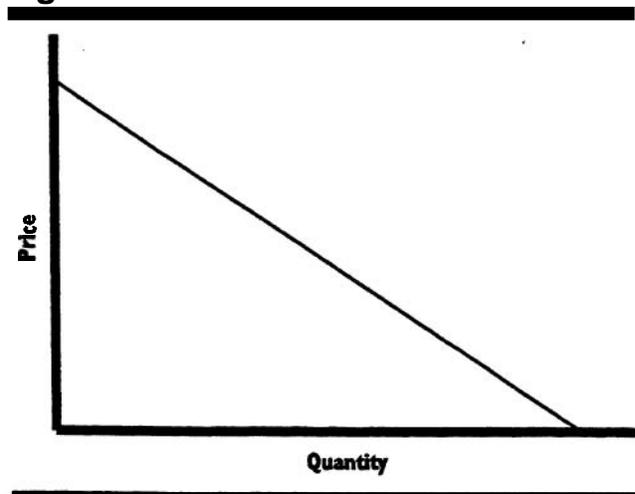


Figure 3 Text Book Demand Curve



The difference between the demand projections implied by Figures 2 and 3 is quite significant, both for the entrepreneur and for makers of public policy. Innovators are necessarily monopolists at the point that they first bring their product to market, and they must set a price, since there is no invisible hand to do it for them. If the demand curve that they face resembles Figure 3, they will maximise their cash flow by holding back production to the point that less than half of their potential customers can afford their product. If, on the other hand, the demand curve is more like Figure 2, they must reach nearly 80 per cent of their potential customers in order to **maximise** their revenue. (If the demand curve was truly like Figure 1 they should sell no more than one unit to maximise their profit.)

Empirical and anecdotal evidence suggests that the demand curve facing an entrepreneur is much more like Figure 2 than Figure 3, and for this reason the standard IO text **books** are unlikely to be of much help to an entrepreneur trying to calculate the proper price at which to launch an innovation. Martin (1993) conveys the impression that it would be faintly disreputable for an economist, even an industrial one, to offer advice on price setting to producers, and so this lack of relevance may be of little concern to the majority of 10 economists.

FIXED AND VARIABLE COSTS

Neoclassical economics works from the assumption of equilibrium ("this is [very nearly] the best of all possible worlds") and studies the effect of **marginal** changes from that state. Since consumer welfare is assumed to be enhanced by increasing the supply, and lowering the price, of "product" one of the first concerns of the neoclassical economist is to determine when such an increase in supply and reduction in price is possible. The conclusion is that consumer welfare is maximised when prices are reduced to the point that producers would actually lose money by producing one more item. For a producer, the **difference** between producing $(N - 1)$ items **and** N items is the "marginal cost" (MC). Consumer **welfare** is maximised when the price is forced down to this level by competition, that is, $P = MC$.

From the point of view of a producer, the ideal price is where selling one more unit will produce an increase in total revenue that exactly balances the extra cost. The increase in revenue consists of the price of the N^{th} item less the loss in revenue caused by lowering the price on $(N - 1)$ items to the point that a buyer will come forward for the last (N^{th}) item. This difference is the "marginal revenue" (**MR**) and producer profits are maximised when $MR = MC$.

Managers of enterprises, whether new or established, do not usually refer to "marginal" costs, but they generally divide their costs between fixed (or overhead) costs and variable costs. For most practical purposes the variable cost per unit is constant, as long as the enterprise is actually functioning, for any output between zero and full capacity. The marginal cost MC is not identical to the variable cost, but it is not too different from it. If a company is forced, by competition, to operate a pricing strategy where $P = MC$ the **firm's** variable costs are covered, but its fixed costs are not. Since interest is generally a fixed cost, it does not take too long with prices at this setting before the bank moves in and forecloses.

Neoclassical economists offers two explanations as to why businesses should not fear marginal cost pricing. One is the assumption of decreasing returns: as output approaches capacity, says this theory, marginal costs will increase, so that when a firm is operating at full capacity the revenue generated by marginal cost pricing will be high enough to cover fixed costs as well. When economists wishes to assume that costs behave in this way they express their assumption by saying that "marginal costs equal average costs" or $MC=AC$.

The alternative explanation is that yes, true marginal cost pricing will not cover fixed costs, and so under competitive conditions none of the competing firms will be able to pay interest on their loans or a return on their equity capital. This will cause firms to leave the industry until prices rise sufficiently above marginal costs to cover interest payments and a "normal" return on equity.

Practical managers generally reject the rising marginal cost hypothesis with derision. The most popular economics textbook anticipates this by saying that managers have "bounded rationality", and are unable to find out what the true costs of running their businesses are. Since the authors of this textbook lived to a ripe old age, they probably never got round to explaining to the chief executive of a major American corporation that he did not understand his firm's cost structure. There is an even more serious objection to the assumption that $MC=AC$, and that is the increasing importance of service and software industries in a modern economy. The "marginal" cost of producing one extra unit of service, one extra seat in a theatre, or one extra copy of a computer program or videotape, is zero for all practical purposes, and not even neoclassical economists believe that firms can **survive with** zero prices and revenues.

The exit hypothesis is more realistic; most managers are aware of firms and divisions of firms that have had to cease trading because of an inability to generate sufficient cash to cover overheads. Exit is not, however, viewed with equanimity by most managers. Firms that are forced to leave markets discover that a major part of their investment is market- or product- specific, and **must** be written off or sold for a fraction of its nominal value. The prospect of incurring a heavy loss on a forced exit deters firms from entering markets unless their managers foresee supernormal returns. Dixit (1992) gives an explanation for this behaviour based upon financial options theory. Martin (1993: Chapter 11) introduces and analyses the neoclassically-based theory of "contestable markets" and finds it wanting.

IO theory as set out in Martin (1993) does not explain how firms in competitive markets cover their fixed costs (unless the pervasive assumption that $MC=AC$ can be taken as an explanation) but the eminently neoclassical Dixit (1992) has provided the basis for a theory of entry and exit that can explain how prices can be stabilised at a profitable level in static and growing markets.

PRODUCT DIFFERENTIATION

A great deal of economic writing is based upon markets where the products offered by different suppliers are identical. Such markets are "competitive" when each producer supplies as much product as they are physically capable of and the free entry of further competitors reduces prices to equal marginal costs. Such markets are extremely rare in most people's experience: even if two suppliers sold physically identical products

they must necessarily offer them from physically separate premises, one of which will be more conveniently located than the other as far as any single consumer is concerned.

Most of the analysis of product differentiation in Martin (1993) limits itself to the case of an essential commodity sold at multiple locations, although the narrative includes the case where products are physically different. This case is reduced to a spatially distributed case in the analysis by the assumption that buyers will choose the product at a minimum logical distance from their personal ideal, but the assumption that at least one product must be purchased is retained. In either version of the model of differentiation introduced in Martin (1993) it is possible for the difference in convenience or other measure of distance to be overcome by price.

The analysis carried out by **Martin** (1993: Chapter 11) is rendered of dubious value to entrepreneurs by the pervasive use of the demand curve shown in Figure 3, as well as by the attitude that helping entrepreneurs is, to some extent, a matter of helping the enemy. In a remark at the end of this chapter Martin notes:

Models of vertical product differentiation are useful for analyzing the coexistence of high-quality and low-quality brands. The emphasis on income distribution as a determinant of the number of varieties is a feature that does not appear in models of horizontal product differentiation.

Yet there must be few products that differ in only a single quality dimension. Razor blades, our earlier example, differ not only in durability but also in shape, sharpness, number of tracks, and other characteristics. A product which is quite different from a razor blade in many characteristics — an electric razor — will also provide a shave. (Martin 1993: 294–95)

Visits to a barber or the use of a depilatory cream will provide the equivalent of a shave, while most societies now accept men with beards. Most buyers of razor blades can decide to use the old one for a few more days. It seems clear that Martin is aware of the weaknesses in the analysis that he presents, which suggests that such analyses are unlikely to prove very valuable to active entrepreneurs.

MARKETING EXPENSE AND INVESTMENT

The most basic problem every ethical entrepreneur faces is that the new or enhanced product, or the product offered in a new market, is unfamiliar to potential purchasers. Lacking any information about the product, they won't buy it. Knowing that customers won't buy it, retailers and distributors will refuse to stock it. Unless this double barrier can be surmounted, the new product must fail. Jumping ahead a few years, the entrepreneur's reward comes from a reversal of these **barriers'** effects. Once a **substantial** cohort of satisfied users of a product exists, these users will preferentially buy that product even at a price that allows its producer an economic profit. The entrepreneur will have enjoyed a substantial augmentation of wealth in the form of equity in a successful trading enterprise.

This entrepreneurial wealth can be used as a source of enhanced income or sold at a substantial premium to its asset value. The fact of hysteresis in a market's response to an innovation, including the shape of the adoption **curve**, is known with as much certainty as any **facet** of human **behaviour** can be. Even the relative roles of promotion and inter-user influence are known to a relatively high degree of precision, while the cost of establishing a given level of market acceptance can be predicted on theoretical grounds and **confirmed** on empirical ones.

The ongoing costs of marketing (including research, promotion, and selling) and distribution (packaging, transport and warehousing, and the margins offered to **distributors** and **retailers**) are often the largest identifiable components of the final user price. For fashion and cosmetic products these expenses may account for **two-thirds** or more of the price tag. For more familiar packaged goods sold through supermarkets the total marketing and **distribution** expense generally exceeds 40 per cent of the retail price. These are significant sums, and an entrepreneur who does not allow for them will not produce a viable financial plan.

In Martin (1993), and presumably in other textbooks on industrial economics, the terms "goodwill" and "reputation" appear, but with little attempt to quantify them, and in the analytic part of the text they generally get assumed away.

The reluctance of neoclassical economists to take marketing issues on board may be associated with their attachment to equilibrium conditions and to static analysis. Entrepreneurial activity is disequilibrating, usually deliberately so. The fact that the adoption of a new product depends so heavily on inter-temporal and inter-user feedback effects means that it is hard to explain using either static or equilibrium analysis. Entrepreneurial activity leads to chaotic results, in the sense that success and failure can, in general, only be explained in retrospect, as can the magnitude of the ultimate success. Gaining the attention of a single supermarket buyer (or, for an industrial product, a single purchaser) can lead to a product becoming a substantial success while other products, apparently just as attractive, never make it.

Nothing in Martin (1993) offers any assistance to an entrepreneur planning a new venture marketing campaign. More broadly, industrial economics offers little to entrepreneurs planning an entry to a market:

Theoretical models treat **entry** and exit as things that happen in response to levels of profit or expected profit that differ from the **long-run** equilibrium value. Among other **things**, this implies that one should observe either entry or exit for a single industry, but not both.

Real-world data suggest that entry is a hazardous enterprise. In most industries, firms enter and exit simultaneously through what amounts to a revolving door, but few firms **make** it to the lobby and manage to **maintain** an enduring presence in the industry. Most entrants have little if any influence on market performance because most entrants exit, and fairly quickly. Market performance is likely to depend much more on the flow of entrants who survive than on gross or net entry flows, and the theoretical and empirical analysis of entrant survival remains a field that is largely unexplored. (Martin 1993: 209)

CONCLUSION

Industrial economists as represented by Martin are, in general, concerned with many of the problems that face entrepreneurs and their descriptions of firms and markets is more recognisable than the perfectly competitive equilibrium models of their purer brethren.

The relevance of the study of industrial economics for practising entrepreneurs and students of entrepreneurship is tenuous for a number of reasons. The first of these is the lack of sympathy shown in Martin's text and the references he quotes for the practical and emotional problems facing an entrepreneur, and a lack of acknowledgment of the **welfare-enhancing** role of the innovator. The impression conveyed is that entrepreneurship is, at best, a necessary evil but that entrepreneurs will, at the first opportunity, conspire with their fellows against the general welfare.

The use of a linear demand curve in most of the analysis in Martin renders his quantitative conclusions largely valueless to entrepreneurs, and may distort some of his qualitative conclusions as well. The total failure to include the major marketing variables in the analysis further reduces the practical value of Martin's work, and by implication, that of IO theorists generally.

On the other **hand**, most of the problems of IO theory are presented in Martin in a **form** which would **permit** of them being reworked under realistic assumptions of demand and market response. Classical economics largely lost its relevance to the real world with the invention of steam power: ironically, Boulton and Watt received their patent on the condensing **steam** engine in the same year that Adam Smith's *Wealth of Nations* was first published. The first major flaws in neoclassical economics were revealed by the launch of the T-model Ford in 1912, and the perfect market assumption was rendered invalid by General Motors from 1923 and Procter and Gamble in the 1930s.

It is not clear what form of economy will ultimately replace the current innovation-driven, entrepreneur-based ones at the vanguard of development, so there is a window of opportunity during which economics, led in part by IO theory, may catch up with the real world again.

REFERENCES

- Arthur, W. Brian (1990), "Positive Feedbacks in the Economy", *Scientific American* 262 (February).
- Baumol, William J. (1968), "Entrepreneurship in Economic Theory", *American Economic Review* (Papers and Proceedings) 58.
- Dixit, Avinash (1992), "Investment and Hysteresis", *Journal of Economic Perspectives* 6(1) (Winter) pp 107–32.
- Kauffman, Stuart A. (1993), *The Origins of Order: self-organisation and selection in evolution*, New York: Oxford University Press.
- Kirzner, Israel M. (1982), "Uncertainty, Discovery and Human Action: A Study of the Entrepreneurial Profile in the Misesian System", in I.M. Kirzner (ed) *Method, Process and Austrian Economics: Essays in Honour of Ludwig van Mises*, Lexington MA: D.C. Heath.

- Langlois, Richard N. and Robertson, Paul L. (1994), "An Evolutionary Approach to the Theory of the Firm", *Conference of Industry Economics*, Canberra: Australian National University.
- Lebergott, Stanley (1993), *Pursuing Happiness*, Princeton NJ: Princeton University Press; quotation from Oi, Walter Y. (1994), "On the Uncertain Returns to Inventive Activity", at the *Conference of Industry Economics, Canberra*, Australian National University.
- Martin, Stephen (1993), *Advanced Industrial Economics*, Oxford: Blackwell Publishers.
- Nightingale, John (1993), "Solving Marshall's Problem with the Biological Analogy: Jack Downie's Competitive Process", *History of Economics Review*, 20 (Summer).
- Schumpeter, Joseph A. (1934), "The Theory of Economic Development", *An Inquiry into Profits, Capital, Credit, Interest and the Business Cycle* (trans R. Opie), Cambridge MA, Harvard University Press.
- Schumpeter, Joseph A. (1942), *Capitalism, Socialism and Democracy*, New York: Harper & Row (Reference to fifth British edition, London: George Allen & Unwin Ltd, 1976).
- Waldrop, M. Mitchell (1992), *Complexity: The Emerging Science at the Edge of Order and Chaos*, New York: Simon and Schuster.