A GENERAL THEORY OF VALUE

Appendix Seven: ***The Example of Auctions***

An interesting case study for the model of the seller's perspective presented in Chapter Eight, using Equation 7.2, is that of the *auction*.

Here the vicinity is finite and closed, $S = 1$, $G_{B_s} = 1$(at a time), and $B_s \geq 2$. The auctioneer's banter and literature is likely to deploy one or all of the seller's price-pressuring strategies we have just been discussing,[1] and the price fetched for the good is apt to be the greater as the number of potential buyers increases (and each buyer knows that this is happening). Can we find an auction-typical value for β and γ and μ from empirical data? (I shall drop subscripts for a while.).

There is a body of economic research dealing specifically with auctions, a relatively small part of which is empirical. Both the theoretical and empirical studies find that final transaction prices, P, rise as the number of bidders increases, or fall if they are "contract-to-provide" auctions [i.e. auctions where $B = 1$, and $S = G > 1$]. With $\mu \approx 0.25$, and $\beta = \gamma = 1$, these results are in close accordance with our Equation 7.3 as well as with common sense.[2] It seems that the value of μ for initial public offerings (I.P.O.s) of stocks might be around 0.25 also, where P is the stock price fetched on the open market in the first few hours of trading, $K_{s,0}$ is the initial offering price set by the company and its underwriters, and B/G is the ratio of orders for shares to the number of shares offered.[3] Later, K_s rules.

In labor markets, where the seller's goods are his skills and time, the closeness to zero with which a given worker is able to set the value of γ in the minds of would-be employers depends on his education and experience. The job-seeker would like to be unique, but not so unique that only one buyer will want him. There are trade-offs between these two factors. I have no realistic estimates to offer for β, γ, and μ in various labor markets. But we might note that collective bargaining by labor unions has the effect, in our terms, of making $S = G = 1$, as at an auction: all workers acting as one against the bids of several employer-buyers of their labor. During a strike against a single company, however, $B = 1$, making the size of μ, β, γ a moot issue as long as the company pledges not to seek to replace the workers, which would make $S > 1$. Seeking to divide the ranks of the workers effectively makes $S > 1$ also; just as seeking to divide management makes $B > 1$. But with Equation 7.3. dead in the water, so to speak, because $B = S = G = 1$, both sides will tend to move to arguments based upon the "buyer's perspective" modeled by Equation 7.3 below, or to wrangling about β, γ, N and μ.

Farthest from auctions as a method of allocating goods, and therefore illustrative by contrast, are discount superstores for goods such as clothing. Here the average shopper in a one hour stay confronts thousands upon thousands of individual items varying in size and style and pattern and fabric, and competes very little with other shoppers for the possession of any one of them. Although shoppers distinguish themselves from each other by looking for clothing that will suit *them* specifically, this only shadows the inherent variety (non-substitutability) of the goods. The seller, except at the roughest demographic and socioeconomic levels, discriminates not-at-all among potential buyers. All are welcome. These criteria serve to raise β and lower γ as though to compensate for the fact that G is so much larger than B. r_s^{μ} ends up at around 1.1, the enormous stock of goods being paid for effectively once-only as a capital investment in offering choice—read, freedom—to his customers.

NOTES:

[1] See for example Andrew Decker, "Anatomy of an Auction," *ARTnews*, May 1995, pp. 134–137, where we read of B and β being forced up, and G and γ down, by a dozen subtle practices at Sotheby's and Christie's. Equation 7.4 comes into play too as (1) different consignors have different reasons to commission these auction houses to sell the works they own and (2) the auction houses find themselves in the role of competing buyers. A detailed analysis of this system is beyond the scope of this chapter and, no doubt, the reader's patience.

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[2] There are no extant data that fix the value of β and γ for auctions with any certainty. But an interpretation by R. Preston McAfee (1987, p. 729) of data provided by Kenneth Gaver (1977) suggests that $\mu \approx 0.25$. By way of corroboration, John Hey (1991, p. 194) reports research showing that the number of bidders raises final transaction prices paid (in English auctions) by a factor consistently above the predictions of "risk-neutral Nash equilbrium" (RNNE) given by $P_{b,} \approx [(B-1)/B]v_b$ where P_b is the bid price of bidder b and $v_{b,k}$ is bidder b's privately held value of the good (in dollars). For what it's worth, our formula, $P = P_s = r^{\mu}_s K_s$ with $S = G_{S,B} = 1$, $v_i = K_s$,, $\beta = \gamma = 1$, and $\mu \approx 0.25$, gives results directly which agree with those reported by Hey: i.e. a consistent shift of prices to a constant level above that predicted by the RNNE model and to the same extent. Hey attributes this difference to risk-aversion by buyers than sellers; we might point to differences in the substitutabilities of the buyers and the good (with other goods).

See R. Preston McAfee and J. McMillan, "Auctions and Bidding," *Journal of Economic Literature,* Vol. XXV, June 1987, p. 711; Charles Holt, "Uncertainty and the Bidding for Incentive Contracts," *American Economic Review*, September 1979, Vol. 69, No. 4, pp. 697–705; Kenneth M Gaver and J. L. Zimmerman, "An Analysis of

Competitive Bidding on BART Contracts," *Journal of Business*, July 1977, Vol. 50, No. 3, p. 279–289; Lance Brannman, J. D. Klein, and L. W. Weiss, "Concentration and Winning Bids in Auctions," *The Antitrust Bulletin*, Spring 1984, Vol. 29, No. 1, pp. 27–31; Richard Thaler, *The Winner's Curse*, (New York, The Free Press, 1992) pp. 50–62. Thaler discusses bidder *uncertainty* about the *number* of rivals. This also tends to raise final transaction prices (or decrease them in contract-to-provide auctions), especially when combined with uncertainty about the objective value of the good. This we have not modeled.

Perhaps the most accessible and succinct review of auction strategies is to be found in Steven Landsburg's *The Armchair Economist* (New York, Simon and Schuster, 1993), pp. 174–180. The virtues of this exposition, plus a good dose of technicality and survey reportage of experimental data, can be found in John D. Hey, *Experiments in Economics* (Cambridge, Mass., Blackwell, 1991) pp. 180–198.

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[3] This estimate requires statistical verification over a large number of I.P.O.s, however, a task I leave to future researchers. I base my tentative claim here on analyzing the data reported by Glenn Rifkin in "The Anatomy of a High-Flying I.P.O., Nosebleed and All," *New York Times,* 2/19/95, p. B7. Note that $\log(1+B/G) \approx (\log B + 1)/(\log G + 1)$

I would join those readers who would be more impressed if theory alone could determine β and γ and μ rather than empirical research, since the latter procedure always allows one to set β and γ and μ after the fact in such as way as to make the theory look as though it had "produced" the data as found. But I take heart from the fact that the equations used by the physical sciences—the more so as they ascend from physics through chemistry through to biology and engineering—are also peppered with abitrary-seeming constants and parameter-settings, numbers that have no apparent deeper reason-for-being apart than the fact that they are found to be just so: the mass of a proton, the gravitational constant, the speed of light in a vacuum, the specific heat of bismuth, the melting point of gold, the viscosity of oil. This is why science happens in the laboratory as well as at the chalkboard.

The laws of thermodynamics themselves, to which our theory of value constantly appeals, "cannot be derived or proved; they are the result of numerous experiments on a tremendous variety of substances," write chemists David Oxtoby and Norman Nachtreib. They go on:

> We cannot even "check" the first law by independently measuring ΔE, w (work), and q (heat), because there is no "energy gauge" that lets us determine energy changes, ΔE, independently of w and q. But what we *can* do is measure w and q for a series of different processes connecting the same initial and final states, and we find that their sum $w + q$ is always the same. We use this to define the energy system. Thermodynamics is concerned with changes in the energy of a system. It does not allow us to measure the absolute energy of a system. In fact it is not possible by any mans to know the absolute energy of a system: it has no operational meaning.

The same might be said of our primal variable, Ω, the objective complexity-and-organization of a system at any and all scales, which probably cannot be measured with finality, and of *value* which is a measure of Ω's change as manifested in changed "lifefulness," or "happiness," or even, roughly, in a sum of money, a price.

The above quote is from *Principles of Modern Chemistry* (Chicago, Holt Rinehart and Winston, 1987) p. 225.
