

Supplement to ASI Newsletter Winter 2001: Enhancing the Quality of Real Estate Decisions through a Liberal Education

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At the Hoyt Group, our mission is to improve the quality of real estate decisions. This mission is pursued with reliance on the Fellows pursuing their own individual professional activities that are supportive of the Institute's mission. It is a symbiotic relationship in that the Fellows have some reliance on the Institute as a venue for their own continuing education.

Investor Perspective

Natural Science Progress

Professional education, for most of us, has been steeped in the scientific method. The roots are in the high quality of knowledge obtained by the experimental method prevalent in the natural sciences.

But, as Einstein wrote, "So far as the laws of mathematics refer to reality, they are not certain. And so far as they are certain, they do not refer to reality." [*Geometry and Experience*] Reality is no minor matter. The quality of real estate decisions, and indeed decisions in general, relate to reality. The relationship of mathematics to reality was touched upon by Plato in *The Republic*, according to commentary in the translated version by Francis MacDonald Cornford. Cornford wrote, "Higher education is to effect an escape from the prison of appearances by training the intellect, first in mathematics, and then in moral philosophy." [p.222] Then in a footnote, "Conversely, the fact that the mathematician can use visible objects as illustrations indicates that the realities and truths of mathematics are embodied, though imperfectly, in the world of visible and tangible things ... " [p225]

Mathematical progress was a great enabler for the age of enlightenment. Scientific progress in the enlightenment shifted paradigms to a highly quantitative perspective. Federal funding picked up on it in the immediate post-World War II era, and we felt the thrust of in schools of business in the wake of the Ford and Carnegie studies of the late 50's that pushed schools of business to a highly quantitative approach in wide spread curriculum reform.

Professionally we are accustomed to forecasting the outcome of alternative courses of action with some mathematical precision, generally based on linear assumptions. Contemporary thinking is adjusting the typical process in at least a couple of ways. First, let's consider fuzzy logic. Then, let's look at chaos theory.

Fuzzy Logic. Fuzzy logic holds that, "Everything is a matter of degree including truth and set membership." Furthermore, fuzzy logic refers to, " ...reasoning with fuzzy sets or with sets of fuzzy rules." [*Fuzzy Thinking*, by Bart Kosko, p292] Simplistically, how little hair needs to be on a man's head before he is considered bald?

In my view, fuzzy logic is rooted in the difference between digital and analog perspectives. Mathematically, we are accustomed to a digital perspective, even though we may sometimes slice

the quantification to get as many decimal places as suits us. The perspective, digital or analog, makes a difference in classification, which we do a lot.

Aside from classification, the fuzzy logic approach now utilizes a technology that permits development of so called "smart machines." These machines are able to make complex adjustments rather than dealing with simple rules. The claim is that fuzzy logic is a step beyond the expert systems of artificial intelligence that rely on bivalent (either/or) rules. [p.159]

Chaos Theory. "Where chaos begins, classical science stops. For as long the world has had physicists inquiring into the laws of nature, it has suffered special ignorance about disorder in the atmosphere, in the turbulent sea, in the fluctuations of wildlife populations, in the oscillations of the heart and the brain. The irregular side of nature, the discontinuous and erratic side - these have been puzzles to science, or worse, monstrosities." So says James Gleick in *Chaos*. [p.3]

An excellent example to convey the salient concept of a chaotic system is the Lorenzian Waterwheel. "Water pours in from the top at a steady rate. [The buckets in the waterwheel have holes in them resulting in a loss of water dripping through the holes.] If the flow of water [to the bucket at the top of the wheel]...is slow, the top bucket never fills up enough to overcome friction, and the wheel never starts turning. If the flow is faster, the weight of the top bucket starts the wheel in motion. The waterwheel can settle into a rotation that continues at a steady rate. But, if the flow is faster still, the spin can become chaotic, because of the nonlinear effects built into the system. As buckets pass under the flowing water, how much they fill depends on the speed of spin. If the wheel is spinning rapidly, the buckets have little time to fill up. Also if the wheel is spinning rapidly, buckets can start up the other side before they have time to empty. As a result, heavy buckets on the side moving upward can cause the spin to slow down and then reverse. In fact, Lorenz discovered, over long periods, the spin can reverse itself many times, never settling down to a steady rate and never repeating itself in a predictable pattern." [p.27]

All of this speaks to predictability. We are limited in the predictability in the natural sciences perhaps more than we think. Predictability becomes even more difficult in the social sciences.

Social Science Progress

We might visualize the progress in the natural sciences by constructing a graph representing the speed at which man could travel on the vertical axis and time on the horizontal axis. There would be along relatively flat line representing how fast man could run, with a step up to the speed of riding a horse, and then a train and plane. That would start a sharp curve, but jet and space travel would make the curve astounding.

We probably have not turned the curve in social sciences. If we have, it has been in recent times. Our attempts to advance knowledge have been built upon the experience in the natural sciences. However, the social sciences are different. Aside from the problems of replicable experiments, we have the problem of understanding the system which in fact is a changing system. It is reasonable to debate the issue as to whether it is a matter of degree or kind, since the natural environment has changed. As long as one concedes that people have changed substantially over time as to abilities and cultural systems, then one would expect that the problems, on which to gain high quality knowledge, are at least more difficult than those in the natural sciences, if not substantially

different as to applicable methodologies. Even with the greater difficulties, there has been progress.

Much of the progress has come because of the advances in natural science and the engineering applications, especially as we are experiencing an information revolution. Somehow we exalt the creation of knowledge and give short shrift to the engineering that applies the basic knowledge. This phenomenon is strange since most of us are in applied areas.

The information revolution is changing our behavior. Organizational changes have occurred because, among other things, much of middle management became superfluous. Much of this change is attributable to the managed institution. In the words of Peter Drucker, as quoted in the Spring 1999 *Supplement to ASI News*, "... the center of a modern society, economy and community is not technology. It is not information. It is not productivity. The center of modern society is the managed institution. The managed institution is society's way of getting things done these days. And management is the specific tool, the specific function, the specific instrument, to make institutions capable of producing results." Furthermore, our understanding of our behavior is also changing.

Cognitive Science. ACognitive science is the interdisciplinary study of mind and intelligence, embracing philosophy, psychology, artificial intelligence, neuroscience, linguistics, and anthropology. Its intellectual origins are in the mid-1950s when researchers in several fields began to develop theories of the mind based on complex representations and computational procedures." So writes Paul Thagard in *Mind*. [p.ix]

Understanding how we think is only part of it. Another part is how we change our thinking. According to Susanne Haberstroh [<http://www.sfb504.uni-mannheim.de/glossary/behave.htm>] referring to Festinger and others, "The cognitive dissonance theory is a general theoretical framework which explains how people change their opinions or hypotheses about themselves and their environment. An important application of cognitive dissonance theory is research on attitude change. The basic assumption of cognitive dissonance theory is that people are motivated to reduce inconsistent cognitions. Cognition refers to any kind of knowledge or opinion about oneself or the world."

The quote continues, "Two cognitions can be either relevant or irrelevant. If they are relevant, then they must be consonant or dissonant (i.e. that one does not follow from the other). Dissonant cognitions produce an aversive state which the individual will try to reduce by changing one or both of the cognitions... Cognitive dissonance can be reduced by adding new cognitions, if (a) the new cognitions add weight to one side and thus, decreases the proportion of cognitive elements that are dissonant or (b) the new cognitions change the importance of the cognitive elements that are in dissonant relation with one another. The other way to reduce cognitive dissonance is to change existing cognitions. Changing existing cognitions reduces dissonance if (a) the new content makes them less contradictory to others or (b) their importance is reduced. If new cognitions cannot be added or the existing ones changed, behaviors that have cognitive consequences favoring consonance will be recruited. Seeking new information is an example of such behavior." In short, society, in our westerns civilization, has changes its views over time and has done so in part because new information has indicated better decisions on a wide range of matters.

Behavioral Economics. We are accustomed to thinking in terms of the "rational man." That is, we assume rational behavior meaning "that individuals maximize some target function under the constraints they face in pursuit of their self interest." Joachim Winter provides this definition and some related terms as follows: "The term *bounded rationality* is used to designate rational choice that takes into account the cognitive limitations of both knowledge and cognitive capacity. Bounded rationality is a central theme in behavioral economics. It is concerned with the ways in which the actual decision-making process influences decisions. Theories of bounded rationality relax one or more assumptions of standard expected utility theory."

"The concept of utility enters economic analysis typically via the concept of a utility function which itself is just a mathematical representation of an individual's preferences over alternative bundles of consumption goods (or, more generally, over goods, services, and leisure). If the individual's preferences are complete, reflexive, transitive, and continuous, then they can be represented by a continuous utility function. In this sense, utility itself is an almost empty concept: It is just a number associated with some consumption bundle."

"In neoclassical economic theory, it is assumed that decision makers, given their knowledge of utilities, alternatives, and outcomes, can compute which alternative will yield the greatest subjective (expected) utility. The term bounded rationality is used to designate models of rational choice that take into account the cognitive limitations of both knowledge and cognitive capacity. Bounded rationality is a central theme in *behavioral economics*. It is concerned with the ways in which the actual decision-making process influences the decisions that are eventually reached. To this end, behavioral economics departs from one or more of the neoclassical assumptions underlying the theory of rational behavior. The two most important questions that can be posed are: Are the assumptions of utility or profit maximization good approximations of real behavior? Do individuals maximize subjective expected utility?"

We can get better forecast of outcome of decisions if we take cognizance of behavioral economics. We can do even better if we include behavioral finance in our paradigm.

Behavioral Finance. "Despite strong evidence that securities markets are highly efficient, there have been scores of studies that have documented long-term historical phenomena in securities markets that contradict the efficient market hypothesis and cannot be captured plausibly in models based on perfect investor rationality. Such phenomena are often referred to as stock market anomalies." So writes Andreas Laschke on the same web site. The entry continues, "Behavioral finance is a discipline within the field of finance which seeks for psychology-based theories to explain such anomalies. Within the behavioral finance paradigm it is assumed that the information structure and the characteristics of market participants systematically influence their investment decisions as well as market outcomes."

The behavioral finance group at the University of Mannheim seeks to "better understand and describe financial markets by the implementation of behavioral concepts." On their web site they write, "As opposed to classical economics, behavioral finance centres on the behaviour of market participants. The discipline is a critical observation of [the] way investors select and process information before a decision and of how that decision ultimately guides subsequent research. The discovery of anomalies reveals that there are limits to human rationality. Moreover, when errors do appear, Behavioral Finance demonstrates that most people make the same mistakes at

the same time. This means that the errors are systematic and, therefore, forecastable."

We have been looking to apply this paradigm to the Flow of Funds Project. The following is an excerpt from an internal memo of June 4, 2001 filed as "Flow of Funds Structural Analyses."

"In thinking about the forthcoming additional investments in REITs, the flow of funds issue returned. This time I pursued thinking through the beginning of a theoretical structure by making up a list of data series that would be helpful in an early detection of forces leading to shifts in general levels of REIT prices. As usual, it is unconstrained by availability of data. We start with the wish list and then see what is doable..."

"...The key to the analyses is that some sources of funds may consistently be early movers. Others may be consistent laggards. And, some may be those that push the prices well beyond sustainable levels. The thesis is that there are some investors who consistently behave as value investors moving in when REITs as a group are undervalued, others are momentum investors who go with the flow, and there are others who don't go with the hard numbers but rather with the irrational exuberance, or tea leaves, or whatever. While we don't know enough about the specifics of the behavior, we may be able to identify the groups that lead the pack. That identification is the task, as is constructing the series that will give the early signals. [By the way, this might make a good dissertation topic.]..."

"...The focus of the structure of flow of funds is on the structure of sources as the initial concern. Furthermore, the focus is on the amount of money coming into the market segment that is simply raising price levels. Mere swap of ownership without price level changes may be of interest, but it is the source of funds from sources willing to bid up prices that is of major concern."

While we may not know why they are willing to pay more, we can see behavior, i.e., that they are paying more. At some point, I really want to re-examine the decomposition of cap rates which will be the clues to which risks are involved in the changing price levels. The clues for the present start with which segments of sources of funds are increasing their flow of funds to REITs."

"...A great deal of the flow of funds to REITs is attributable to changes in other sectors of the capital markets rather than to underlying REIT fundamentals. Earlier memos deal with this, so it will not be repeated here. But, the plan should consider a substantial component for the capital market as a whole."

We at the Hoyt group have been pursuing this inter-disciplinary effort. Furthermore we seek to enlist others to work with us. In order to facilitate this effort, \$50,000 in research support has been authorized for this year. It is budgeted in two stages. The first stage is for three projects in the under \$10,000 range. These include a state of the art report, considering such matters as an appropriate theoretical framework, annotated bibliography of the most relevant research, and data availability. The intent is to develop a longer range research agenda that would include getting the relevant data developed.

The second stage of the first year's effort is predicated on raising an additional \$25,000 to match the seed money. As this article goes to press, \$10,000 has already been raised.

This research program is related to Real Estate Capital Flows Consortium to be developed as an outgrowth of the symposium and roundtable efforts described in the accompanying box.