

## **GRAASKAMP AND THE DEFINITION OF RIGOROUS RESEARCH**

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June 25, 1999

Prepared for inclusion in a forthcoming volume, James DeLisle and Elaine Worzala, eds., *Essays in Honor of James A. Graaskamp: Ten Years After*. First draft prepared for the Wisconsin Real Estate Alumni Reunion, September 26-29, 1991. The authors are grateful to the Wisconsin Real Estate Program for financial support. The Center for Real Estate and Urban Economics at the University of Connecticut provided expert secretarial assistance. The authors thank Elaine Worzala and two anonymous referees for comments on an earlier draft.

## **Graaskamp and the Definition of Rigorous Research**

By John M. Clapp and Dowell Myers

The significance of James A. Graaskamp for the academic real estate profession is an open question: divergent views on his accomplishments need to be reconciled. On the surface, there is a sharply divided perception between his admirers and his critics. Charismatic leaders (many of his admirers viewed him as such) often stimulate such sharp differences between devotees and non-believers.

Beneath the surface of debate, however, we believe the question of Graaskamp exposes issues reaching far beyond his person. More than mere camp loyalties, the divided academic evaluations of Graaskamp's contributions reflect deep divisions in the philosophy of science and knowledge, including the proper relations between science and profession, and centering on the notion of rigor. Those philosophical divisions currently are being recognized throughout the social sciences. Graaskamp's contributions can be better understood--and debates reconciled--if placed within that broader intellectual history.

The most acute intellectual division highlighted by the Graaskamp alternative centers on notions of rigor. Whereas in much of academia rigor has come to mean statistical and mathematical precision, for Graaskamp rigor meant something different. He advocated analysis that was of logical relevance to a real world problem. This required a focus on the context of a problem and its many parts, rather than a technical solution for only one part where the context was only assumed. Thus, the definition of rigor should include a grounded thoroughness. This distinction between notions of rigor has lessons that can help us to shed light on the broader issue of how the quality of academic scholarship should be evaluated .

Graaskamp's intellectual position in the history of real estate also reflects the contest between an older paradigm of urban land economics (ULE) and a newer urban economics that largely replaced it within academia (but not the profession). The older paradigm was problem-oriented, inductive, and interdisciplinary, whereas the new paradigm was deductive and oriented to quantitative hypothesis testing. Graaskamp's career encompassed the transition period in which urban economics supplanted ULE, although he remained a firm champion of the older paradigm which he continued to develop and refine. Today, there is renewed recognition of the value of some of the tenets of ULE, and in a closing section we discuss how the merits of both approaches might be combined.

Graaskamp failed to communicate his insights more broadly in academia for several reasons, and we should acknowledge those failings at the outset. By most accounts Graaskamp was brilliant. The debate centers on the alleged misdirection of his pursuits. Graaskamp possessed a unitary vision that he did not care to negotiate or compromise. He was stubborn and self-possessed, and he could be either impolite or openly hostile to scholars he considered misguided. Such behavior is unlikely to win friends and convert new supporters. Graaskamp also did not seek a dominant role within the purely academic arena. His attention was more directed to leading the profession than to leading the academic journals. In a final failing that is the most lasting, Graaskamp published relatively little, not only weakening his contemporary academic status, but also leaving only a small written record for posterity.<sup>1</sup> All of these failings are serious handicaps to academic leadership.

Despite these limitations of manner and style, Graaskamp produced several accomplishments that are widely recognized. In the 1960s, he was among the first to introduce

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<sup>1</sup> We should note, of course, that Graaskamp's physical limitations prevented him from physically writing. Instead, he was a great orator and lecturer.

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computers into real estate research, practice, and teaching. Graaskamp also infused real estate with a risk management and business decision-making perspective, and he advocated logically-grounded methods of appraisal and feasibility analysis. Graaskamp was also well known for his emphasis on real estate education as a product to be highly valued, and he sought to span the gap between academia and the profession through his role as teacher to the profession.

The following essay has three parts. In the first, we review the broad intellectual history that serves as a backdrop for understanding Graaskamp's contributions. That history includes the Wisconsin tradition of urban land economics research and the post-1960 emergence of a new paradigm of urban economics. Also important in this transition were the broader quantitative revolution in the social sciences and the preeminence of a positivist, deductive approach. The second section outlines Graaskamp's major research contributions. We take care to identify how Graaskamp built upon Ratcliff's seminal work, particularly in appraisal, as he forged his own distinct contributions. We also emphasize how Graaskamp's evolving thought departed from the major thrust of academic research during the 1970s and '80s.

Finally, we draw lessons for the meaning of rigorous research. All rigorous research must be logically coherent, but different types of research emphasize different values. We identify two different hallmarks of rigorous research: 1) statistical and mathematical precision, 2) thoroughness. Rigorous research need not exhibit both hallmarks of quality at the same time.

### **I. The Evolving Intellectual Context for Academic Real Estate**

A. Urban Land Economics Roots at Wisconsin

The University of Wisconsin has the longest-established real estate program in the nation. It is a freestanding department that is not subordinated under a finance department, as is most often the case. Instead of finance, the department has its roots in a longstanding tradition of urban land economics.

Urban land economics (ULE) originated in the 1920s and developed through the 1950s with a large cast of researchers, the best known of whom were Richard T. Ely, Ernest Fisher, Homer Hoyt, and Richard Ratcliff<sup>2</sup>. In addition to Wisconsin, major academic centers of ULE were Northwestern, after Ely moved there, Indiana under Arthur Weimer, and under Fisher, Michigan and Columbia. The Wisconsin program was intimately connected with the main body of ULE, not only because Ely's ideas were formed there, but because of Ratcliff's close association with Ely's student, Ernest Fisher, a dominant figure in the field<sup>3</sup>. Ratcliff was a doctoral student of Fisher's, when he was a professor at Michigan, before returning to Wisconsin. When Fisher served as chief economist at the Federal Housing Administration in the 1930s, he employed Hoyt, Ratcliff, Weimer, and other notable land economists. During this period, ULE researchers placed major emphasis on market analysis and appraisal (Weiss 1989), forming the ideas that were to become a cornerstone of real estate academia in the United States.

Perhaps the most succinct statement of ULE is found in Ratcliff's last publication before he died, the Foreword to Goldberg and Chinloy's text, Urban Land Economics, published in 1984. Ratcliff emphasized his view that ULE was a variant of institutional economics and he described the most important features, among them:

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<sup>2</sup> For an historical account of ULE in the period 1920-40, particularly as clustered around Richard Ely, see Weiss (1989)

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- 1) It is problem-oriented and applications-oriented economics;
- 2) It is interdisciplinary in recognition of the broad range of interacting social and technical factors that affect economic affairs;
- 3) In problem solving, it is the present form of the institution and its evolutionary origins, which are the materials of analysis;
- 4) The method is heavily inductive, based on direct observation of all the facts. (Ratcliff 1984: pp. xvi and xvii).

Thus ULE focused on problem solving, including whatever factors were deemed relevant, building up a model of the problem through inductive inquiry. That inductive analysis was interdisciplinary, tracing the many different factors contribution to a problem. The problem usually focused on the valuation/development of a specific parcel. Interdisciplinary, inductive, institutional analysis provided the decision-maker with a framework for valuation and investment decisions.

Urban land economics emphasizes the site location of a real estate property, analyzing its economic function and value, in a broad, holistic manner. This approach evolved in the pre-computer era of the 20th century and is more institutional than quantitative. Under Graaskamp, the urban land economics tradition moved into the quantitative age.

The site-level focus of Graaskamp's Wisconsin program led to an interdisciplinary emphasis on many different features of the site and its improvements: micro-urban geography (sites or site linkages), architecture, engineering, soils, and environmental. Also important were the governmental and political forces shaping entitlements for site use and the supply of future

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<sup>3</sup> *Land Economics*, founded in 1925 by Ely and still edited and published at Wisconsin, served as the flagship journal of ULE, although it was not sponsored by any professional or academic society.

competing sites. On the demand side, attention was given not only to economic factors, but also to demography and consumer psychology, among other factors. All of these supply and demand factors served to shape value.

### B. The Development of Urban Economics

In the 1950s and '60s, researchers began to examine the spatial dimension of economic activity as an extension of economic theory<sup>4</sup>. A doctoral dissertation by William Alonso (1960) and the foundation of the Regional Science Association by Walter Isard in 1954 facilitated the development of the field. Urban economists, notably Muth (1969) and Mills (1972), quickly carried the field forward. Although urban economics and regional science drew on much earlier work by Von Thunen, Weber, and Christaller, it used modern mathematical and statistical tools to provide a new point of departure for research.

Urban economics and regional science propose that households substitute commuting time and costs for housing space and costs. For businesses, transportation of inputs (e.g., steel) and output (to markets) becomes analogous to a factor of production; transportation costs per unit per mile becomes the price of this factor. Urban economics was appealing to academic researchers in the 1960s and '70s. It provided a parsimonious framework that guided the collection and organization of data for empirical analysis. The most important parts of the urban economics model could be formulated with mathematical rigor and tested with new econometric techniques. Most importantly, the theory gave simple predictions about the spatial distribution of economic activity, and about the changes in those distributions, that could be checked against actual data. Urban economics had early successes; i.e., it provided predictions which proved reasonably accurate. For example, it predicted and explained the decline in population density,

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<sup>4</sup> The use of economic theory by urban economists was fundamental in explaining the paradigm revolution that took place in the 1970s in real estate.

rents and land values with distance to the center of the city. Within the same model, it explained the greater "elbow room" in the suburbs as opposed to the central city. More importantly, the model explained and predicted the suburbanization of population and employment. This became a framework for explaining the causes of urban problems (e.g., blight in the central city). Since these policy problems were of major concern in the 1960s, urban economics became well-established as an active field of research.

### C. Abandonment of Urban Land Economics

Increasingly, ULE fell out of step with contemporary styles of research, and soon urban economics began to replace ULE. The most fascinating issues in the history of science are those rare moments when one paradigm overthrows another. The process by which ULE was abandoned and succeeded by urban economics reflects a general pattern of paradigm succession reported by Kuhn.

#### 1. Differences Between ULE and Urban Economics

Three primary characteristics of ULE, perceived as weaknesses by most academic researchers in the 1960s and 1970s, paved the way for its eventual replacement by urban economics:

- 1) ULE studies seem overly inclusive, often leading to descriptiveness and wordiness, i.e., not parsimonious.
- 2) Analyses exhibit a relative lack of mathematical formulation or statistical analysis.
- 3) There is a lack of a clear deductive theory directing priorities in the investigation.

In general, if everything is potentially important, what should we emphasize? What data should we look for? How should researchers establish priorities? Can two scholars replicate the same findings? The absence of a clear, deductive theory for guidance was acutely felt by

scholars newly raised to consider themselves as hypothesis testers. Urban economics is strong precisely where ULE is weak. For example, urban economics focuses the researcher on relatively few causal factors (such as transportation costs and prices of factors of production) within a general theory that lends itself to mathematical and statistical analysis. The new urban economics stressed a deductive theoretical model where location and value relationships could be concisely and formally expressed. Hypotheses were to be deduced and then tested empirically with the new statistical tools of the 1960s quantitative revolution.

### 2. Process of Transition

Kuhn emphasizes that paradigms are replaced, not through the wholesale conversion of competing school members to new schools of thought, but through the recruitment of a younger generation of scholars. When one competing paradigm wins the allegiance of the new generation, the other will slowly wither away. The older ideas live on, but they are no longer considered current and are carried on only by "old-fashioned" members of the profession. Those older members of the preceding paradigm are literally read out of the profession. Such has been the case with the transition to urban economics. For example, very few contemporary scholars have read any of the 1970's and 1980's production by Richard Andrews.

The apparent overnight transition to urban economics is striking. Virtually none of the new literature of the early 1960s cites any of the ULE tradition of the 1930s, '40s, or '50s; instead, the authors skip back to earlier generations and other continents (Ricardo, Losch, et al.). The newly formed urban economics built heavily upon advances in regional science and "locational" economics that decried the absence of space in current economic theory.

One explanation for the rapidity of transition is that the new urban economics paradigm was incubated outside business schools before arriving fully mature. Hoch (1969) provides an informative account of the early growth of urban economics, recounting the role of the Committee on Urban Economics sponsored by Resources for the Future.<sup>5</sup> Institutional backing provided by RFF and by major economics departments, notably at Princeton and Harvard, provided the new paradigm with legitimacy. Urban economics was broadly conceived in the early years, including closely related specialties in public finance regional economics, urban geography, transportation, and others. In economics departments, only one out of 110 courses surveyed in 1968 dealt with urban land and real estate economics. However, in business schools, just over half of all broadly-defined urban economics courses were of the ULE type (Hoch 1969: Table 1). Thus, urban economics developed separately from urban land economics.

A more acute reflection of the isolation of urban economics from the urban land economics of the business schools may be the absence of their faculty from the leadership of the evolving field. Among the 32 members of the Committee on Urban Economics in the period from 1959 to 1968, only one, Arthur Weimer, a former student of Ely's and a ULE proponent, was from business administration or had the term "real estate" listed in his representative publications (Hoch 1969: 68-74).

Developed in economics departments, urban economics grew for some time before moving into real estate departments who began to hire economists, especially after 1975<sup>6</sup>

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<sup>5</sup> In 1958, there was not a single doctoral program in urban economics in the nation: by 1968 there were seven (Hoch 1969: Table 3). Reflecting the rapid growth of the field, 74 doctorates in urban economics had been completed by 1968, while another 93 were in progress that year (Hoch 1969: Table 9)

<sup>6</sup> Hoch (1969) provides an appendix listing all persons who participated in conferences or publications sponsored by the Committee on Urban Economics, or who were supported by a research grant. Although scholars are represented

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However, the transition may have come more swiftly in the literature. The American Real Estate and Urban Economics Association facilitated this transition by linking real estate academics to economists. Long before urban economics replaced ULE in the real estate curriculum, real estate professors were suffering critical reviews by economists in conference presentations and in articles submitted to the AREUEA Journal and other academic journals. In contrast, in professional journals, such as the Appraisal Journal, ULE remained a current theory to a much later date, even to the present. Of course, the professional journals have much less standing in the tenure decision process and so ULE has been effectively read out of the academic profession of real estate.

The transition was also aided by a major institutional threat of the late 1950s and early 1960s. A report from the Carnegie Commission evaluating business schools criticized the lack of theory and scientific method in real estate academia. Associations with the industry were viewed very negatively. As a consequence, real estate academia may have felt compelled to seem more academic and less industry relevant. This political climate strongly favored a deductive model that was accepted as more scientific and more appropriate for academia.

### D. Broader Currents of Academic Change

The paradigm shift from ULE to urban economics was stimulated and reinforced by broader changes occurring throughout the social sciences and, with different timing and emphasis, in the natural sciences as well. Emphasis on the deductive approach and the quantitative revolution was sweeping through the social sciences in the 1950s and 1960s. More recently there has developed a fresh awareness of the role of problem relevance. This was

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from fields as dispersed as sociology, geography, and urban planning, the relative absence of real estate or business school scholars is striking. Out of 146 individuals identified in Appendix M, only four have a real estate affiliation: Weimer on the committee, Anthony Downs, discussant at two conferences, Wallace Smith, recipient of a 1965 grant

reflected earliest in the work of Bell (1980) and McCloskey (1983) among others (see discussion below). Thus, it is time to take a look at ULE. We do this by arguing for a need to question deductive and quantitative approaches. Next, we define these approaches.

### 1. The Deductive Approach in Social Sciences

The deductive paradigm became dominant in economics, especially as practiced in North America during the 1950s and early 1960s. Deductive (objective) modes of thought begin with general principles that are combined with reason to reach specific predictions under given conditions. The stock in trade for objective thought is the logical syllogism, beginning with a set of assumptions (behavioral, limiting and/or simplifying) and drawing their logical implications. Deductive logic is timeless (ahistorical), reproducible, and analytical. As an analytical mode of thought, the organic whole of actual economic behavior is broken down into its component additive parts.

Karl Popper and Milton Friedman helped to define the deductive approach. Popper made famous the notion that truth is elusive. When we have disconfirming evidence we can recognize a generalization which is incorrect; i.e., we can falsify general statements but never prove them. Thus, the best that science can ever hope to do is narrow the range of the possible, and thus reduce the number of propositions which are acceptable. Milton Friedman preached the tenets of the deductive paradigm in his 1953 essay, and he added a proposition: A theory should not be tested by the truth or falsity of its assumptions. Friedman's argument for this proposition is twofold:

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for a book on housing, and David Huff, recipient of a 1961 grant to support his seminal research on retail trade area analysis.

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1. Simplifying assumptions (in physics, the assumption of a perfect vacuum) might be ignored in some situations (e.g., predicting the acceleration of a dense object in the atmosphere);
2. Theory might predict accurately despite the falsity of assumptions (e.g., economic agents behave as if they were utility or profit maximizing).

### 2. The Quantitative Revolution in the Social Science

Econometrics, the application of statistics to economics, became a separate subdiscipline during the 1950s. Econometrics established desirable properties for statistical analysis (e.g., unbiased and efficient statistics) and it developed sophisticated tools for dealing with the numerous problems associated with data analysis (e.g., serial correlation or contemporaneous correlation). Pioneering works by Theil (1958 and 1971), Malinvaud (1966) and Klein (1962) established the value of econometric tools. During the 1960s and 1970s econometrics established its influence in other social science. For example, David Aaker (1971) was instrumental in demonstrating that econometrics could be applied to marketing.

### 3. Questioning the Deductive Paradigm and Econometric Analysis

In the 1980s, a number of scholars have questioned the role of the deductive paradigm in the social sciences.<sup>7</sup> Similarly, the role of econometrics has come under attack. This section investigates the new skepticism.

Neither of Friedman's two arguments (ignore simplifying assumptions and use as if theory) necessarily holds in all situations. For example, if one tries to predict the speed at which decision makers respond to a change in price (e.g., the adjustment of exports and imports to changes in the terms of trade) then the validity of maximizing behavior might be crucial.

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Unfortunately, zealous followers of Friedman have taken his proposition as gospel. All sorts of outrageously unrealistic assumptions such as the "Law of the Single Price" (see Stiglitz, 1987, p. 8) have been made in the belief that realism is unimportant.

Friedman's argument effectively protected the assumption of profit maximization (as well as other assumptions) from tests based on direct observation of what managers do. It significantly discouraged survey research which might ask economic agents about their decision behavior.

The social sciences deal with living systems and highly diversified individuals and behaviors. Inherent in these fields is great complexity: There are so many variables influencing the economic system that it is impossible to account for all of them (missing variable bias). Of course, many of these variables have relatively small influence and a large number of small variables tend to cancel each other out at any time. But, any economy is a living system that changes over time; the relative influences of different variables can change in turn.

Daniel Bell (1980) argues that changing technology, new institutions and new social arrangements and customs cause the subjects of economics to change over time. "There is no intrinsic order, there are no 'economic laws' constituting the 'structure' of the economy; there are only different patterns of historical behavior." (Bell (1980), p. 77)

In tracing the history of economic thought Bell argues that economic theory is a fiction, an ideal, not a model of reality. He argues that economic science should not be abstract, ahistorical or changeless. It should represent real historical processes. This argument is particularly compelling for real estate, where local political and financial institutions play such a large role.

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<sup>7</sup> Similar questions have been raised in the natural sciences, as indicated by our discussion of Popper (below). For a discussion of similar issues in ecological biology, see the debate between Roughgarden, Quinn, and Dunham, and

In an evolving, living system, any variable which is in the background at any one point in time can assume a prominent position at a later point in time. Thus, a model which assumes that a given variable is in the background may be proved incorrect later on (i.e., give incorrect predictions) when that variable assumes a foreground position. This is a necessary part of the complexity of living systems; many casual conditions may operate simultaneously. Leibenstein (1976) has argued that this situation is particularly likely at turning points in the growth of real gross product (national, regional and state), when the many variables which influence growth are roughly canceling each other out. Thus, the failure to predict turning points is caused partly by the inappropriate application of deductive thought to living economic systems. The relevance of this to real estate research becomes clear when one considers the magnitude and importance of real estate cycles to issues.

In later years, Popper qualified his theory of falsifications for similar reasons. He states that "it is never possible to prove conclusively that an empirical scientific theory is false. " (1983, p. xxii). He goes on to say that it is always possible to protect theories from disproof by postulating that crucial variables were not held constant or that observations are inaccurate. Falsification is difficult because "anything like conclusive proof to settle an empirical question does not exist." (1983, p.xxii). This is remarkable because Popper is discussing physics and related natural sciences. Living urban and regional systems grow and develop over time so they are considerably more difficult to study empirically.

With the work of McCloskey (1983), economists began to question the role of logical positivism and the deductive paradigm. McCloskey argued that the received paradigms are often

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Simberloff in *The American Naturalist*, 1983 (Volume 122).

ignored, that they are unworkable (e.g., don't provide strong forecasts) and that they restrict open, creative inquiry. He argues for greater tolerance, for analogy and metaphor and for any argument that is persuasive.

McCloskey's skepticism extends to econometrics (see McCloskey, 1983). McCloskey and other writers (e.g., Leamer, 1983; McAleer, 1985) question the value of significance tests because:

1. Regression estimates are often discarded without reporting that they have been performed;
2. Reported results are often explained by appeal to colinearity, to omitted variable or to vagaries of the available data.

Most proposals for reforming empirical research suggest loosening the rigid paradigm that requires that models first be specified (assumed to be given with certainty by theory) followed by empirical estimates of model parameters. Thus, Leamer and Leonard (1983) suggest extreme bounds analysis (EBA), where a subset of variables is classified as important based on economic theory, to be included in every regression model. Then another set of "doubtful" variables can be systematically searched with alternative regressions. Extreme bounds on the parameters of the important variables should be reported together with statistical tests which relate the bounds to sampling variability.

Implicit in EBA is the discovery of inductive conclusions from the "doubtful" group of variables. There is enough ambiguity in economic theory that any variable of interest can be classified as "doubtful." By addressing the coefficients of the doubtful variables, it is possible to discover, and report inductive inferences (perhaps even in leading journals).

An extreme form of the attack on the received paradigm for empirical research is found

in the Vector Autoregressive Regression (VAR) approach to time series analysis. This approach is based on the notion that *a priori* model restrictions are often not informative when examining cause and effect relationships among a group of variables. Therefore, detailed specification of structural equations is pointless. Instead, the researcher simply searches distributed lagged relationships by regressing each variable on lagged values of all variables.

#### 4. Fresh Awareness for Problem Relevance

Partly as a result of these broader currents within academia, there is fresh concern among university leadership to establish relevance to the needs of industry and society (Bok 1990). Within real estate circles, the industry is forging increasing ties to academia. Emphasis is mounting on defining a problem relevant methodology that is intellectually defensible.

Much has been achieved in the deductive and quantitative revolutions. We should not surrender those gains, but closing the gap between industry and academia may require reevaluation of the lost virtues of the old urban land economics. Kuhn observes that such a recycling of old themes (such as the urban economists did with Losch) and doubling back is common in the progress of science.

## **II. Graaskamp's Contributions Culminating in Feasibility Analysis**

Graaskamp earned his PhD at the University of Wisconsin under Ratcliff, absorbing his mentor's lessons about urban land economics and approaches to appraisal. However, Graaskamp came to the university with his own roots in entrepreneurship and risk management decisionmaking. Those roots distinguished him from Ratcliff as well as from newer real estate academics raised in finance or urban economics. Graaskamp also held more of an interest in the physical real estate product, often stating that he was a frustrated architect whose early ambitions were thwarted by a bout with polio.

Real estate is such a complex business that, without some simplifications, analysts and practitioners would be paralyzed in their decisionmaking. Nevertheless, Grasskamp sought to break down narrow views, rigid assumptions, or simple conventions in real estate research and practice, demonstrating where these simplifications could produce harmful results. Throughout his career, Graaskamp argued for a more holistic and flexible view that he considered attainable.

There are four primary areas where Graaskamp sought to advance the profession. These are the introduction of computers to assist more complex decision-making, a reform of appraisal methodology to include investor behavior and logic, applying risk management principles to real estate investment, and an emphasis on evaluating total--not partial economic--feasibility. In all of these pursuits, the hallmark of Graaskamp's approach was to focus on the assumptions used in practice.

### A. Early Advocacy of Computers to Implement Theory in Practice

The earliest, and least, of Graaskamp's contributions was in the area of computerized cash flow analysis to support appraisal and investment decisions. With the aid of a computer, appraisers would be able to implement the income approach to value more accurately. The

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income approach is strongly rooted in ULE theory, but it is much more difficult to carry out than a simple analysis of comparables. Graaskamp believed appraisers should calculate the after tax cash return from a series of time periods, including income in each period, equity withdrawal at the time of sale, and various tax effects at each time point. The cash flow from each period could be discounted back to an initial investment period, and then aggregated to measure the present value of the investment.

Graaskamp sought to provide the profession with necessary tools for implementing the theory that he considered superior. In one *Appraisal Journal* article he described a computer model available to appraisers by subscription service (Graaskamp 1969). They could send in key input data and receive back output from an expert model designed at Wisconsin and operated by an Ohio firm known as Compraisal Corporation. Soon after, Graaskamp developed and taught an adult education program to introduce computer terminals, for hands-on use, to real estate professionals via EDUCARE. As the technology became more accessible, culminating with the desktop microcomputers, Graaskamp continued to build an emphasis on computers, assisted to a great degree by his longtime student and colleague, Michael Robbins. The following quote illustrates two continuing themes about Graaskamp, one, his efforts to reform the practice of appraisal and, two, his sometimes caustic criticism of behavior that he considered illogical or hypocritical:

"Year -by-year estimates of after-tax cash flow are tedious and repetitious, well suited to the capabilities of a carefully programmed computer. Indeed, the extensive accounting this method requires may be a major factor in explaining appraisers' willingness to accept normalized income for appraisal purposes, while paying accountants to calculate after-tax cash flow for their own real estate investments" (Graaskamp 1969: 52; emphasis added).

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(The words “their own” refer to appraisers’ own real estate investments. He is criticizing those appraisers who pay accountants to calculate after-tax cash flow.)

The greatest benefit of the computer was that it “relieves the appraiser of clerical and computational responsibility, while permitting him to stress his professional understanding of economic and investment research and analysis” (Graaskamp 1969: 56). Graaskamp's hope was that appraisers would begin to focus on the key assumptions in their models, introducing more careful judgment in place of their former mechanistic analysis.

### B. Redirecting Appraisal to Focus on Investment Behavior of the Probable Buyer

As noted, Graaskamp's interest in computers was fueled by his interest in appraisal reform. In this work, he relied strongly upon Ratcliff's seminal work, as expressed in *Modern Real Estate Valuation*. Ratcliff demonstrated how ULE theory could be applied to the question of valuation of individual properties. Through the income approach, an investment model or an economic feasibility model could become an appraisal model.

Graaskamp extended this notion to include not only attributes of the property in question, but also the motivations and behavior of the property seller and potential buyers. Graaskamp sought to determine the most probable buyer for a property, simulating his tax bracket and investment calculus, and from that determining the most likely purchase price. Value does not exist without human actors and should not be estimated as a single, specific price. Rather, value exists as a range associated with a probabilistic model (Graaskamp, 1969:52).

### C. Risk Management and Solvency

The third area of major contribution is related to feasibility but focuses on risk management principles. With his early training in risk and insurance, it was natural for Graaskamp to bring these concerns to bear. In fact, this element of his background may have

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inspired the behavioral, decision-making focus that he fused to the traditional ULE theory. In an effort to refine financial theory for greater project relevance in real estate, Graaskamp conceptualized the entire finance component of real estate around risk management principles (Graaskamp 1977).

Graaskamp defined risk as simply the variance between one's expectations (and underlying assumptions) and realizations, between budget forecast and end-of-the-year profit and loss statements (Graaskamp 1972: 520; 1977: 53). Such variance would normally occur over the timeline of an enterprise, and risk was something to be measured and managed as a normal part of the enterprise.

The first step in risk management is the identification of significant exposures to surprise and financial loss, followed by an estimation of the economic consequences. Rigorous evaluation of all assumptions was mandatory, again reflecting that aspect of Graaskamp's theory. The second basic step in risk management is the design of methods to control and mitigate the consequences.

Graaskamp wrote appreciatively of the wealth of financial theory and techniques available to calculate risk under alternative financial structures and assumptions (Graaskamp 1972: 521). However, Graaskamp's focus was on the precursors to such precise analysis: 1) identifying the potential points of vulnerability, often embedded in basic assumptions; and 2) creatively formulating alternative strategies for managing risk in particular projects (with particular clients).

Not unexpectedly, Graaskamp identified an unusually large number of risk management techniques, reflecting the broad scope of sources of potential risk that he foresaw. Graaskamp

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identified six basic risk management techniques<sup>8</sup>, but then added that the passing of time, in general, is the most critical risk in the development process, because interest charges can erode the developer's resources. Development projects could be impeded by any number of feasibility problems, as listed above, but Graaskamp emphasized that careful market research--reducing uncertainty about project absorption--is the best method for avoiding time and money risk (Graaskamp 1981: 13).

### D. Advocacy of Total Feasibility Analysis

The holistic view of the urban land economists was extended by Graaskamp to include the decision-making behavior of investors and institutional representatives. His determination of a project's feasibility included a great many more factors than financial or economic feasibility. Consistent with his appraisal views, feasibility also could not be determined in the abstract but depended on the objectives and decisionmaking process of a proposed investor. Thus, Graaskamp defined feasibility as a total concept, as follows:

"A real estate project is 'feasible' when the real estate analyst determines that there is a reasonable likelihood of satisfying explicit objectives when a selected course of action is *tested for fit* to a context of specific constraints and limited resources."(Graaskamp 1972: 515; emphasis added)

The notion of "fit" reflects Graaskamp's decision-making orientation: "To test for 'fit' between a course of action and explicit objectives requires a correct statement of the problem, for

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<sup>8</sup> Those were: 1) improving forecasts; 2) combining risks by pooling resources and diversifying; 3) shifting risks by insurance contract; 4) shifting risks by two-party contract; 5) limiting liability for losses through the form of ownership; and 6) hedging through use of contingencies (Graaskamp 1981:12?).

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these objectives are often unique and personal to the client and internal to his own decision rules..." (Graaskamp 1972: 515).

Feasibility of a project could not be determined in the abstract. Even if all possible facts about a project were known, Graaskamp emphasized that the "...question of feasibility is always based on a particular *viewpoint*. A successful investment for the mortgage lender may not be profitable for the equity investor, the space user or the community at large" (Graaskamp 1972: 518; emphasis in the original). Furthermore, it is essential to "...specify the *point* along the enterprise time-line from which the analyst is viewing the project" (Graaskamp 1972: 518; emphasis in the original).

Real estate actors are not rational, in Graaskamp's view, and it is the analyst's job to bring rationality to bear by meshing project analysis with analysis of the client's interest:

Often the prospective client does not clearly understand his own objectives and constraints. It is therefore essential that the analyst thoroughly probe the implicit assumptions of his client. Determination of feasibility depends largely on answering the question "Will it succeed?" by focusing on the counterpoint inquiry "For whom?" "By what standards?" "Based on which assumptions and judgements?" (Graaskamp 1972: 518)

As part of the total feasibility concept, Graaskamp defined seven major types of studies that might be conducted. In this broad concept of feasibility, financial feasibility is treated as the end stage to a much longer decision process. The seven component studies are as follows:

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1. Analysis of objectives for the client;
2. Market trends to identify opportunities;
3. Market segmentation for merchandising targets;
4. Legal and political constraints;
5. Aesthetic and ethical constraints;
6. Physical and technical constraints; and
7. Financial analysis of the proposed investment.

Given the underlying principles of his theory, and observation of the institutional structure governing real estate transactions, Graaskamp deduced these several factors as logically important for "rational" analysis of feasibility. Most other analysts and practitioners, however, largely ignored all but the financial aspect of feasibility. Graaskamp's emphasis given to such factors as legal and political constraints was unprecedented 20 years ago. That was before the rise of the no-growth and environmental movements. In many states, we now recognize that "entitlements" are among the most important factors to analyze for project feasibility. In addition, only recently has Graaskamp's recognition of aesthetic and ethical feasibility been underscored in local development arenas. Similarly, until the past few years, concerns about market trends or marketability were of less consequence, leading to their virtual dismissal and replacement in pro formas by *assumed* occupancy rates and rents.

Graaskamp's total feasibility concept is not merely comprehensive; its primary mission is to call into question the many assumptions involved in making a real estate investment. "Those who act or invest on the basis of a feasibility study are in actuality 'buying' the assumptions about its future productivity... not brick and mortar and ground" (Graaskamp 1972: 521; emphasis in the original). In his view, the task of the feasibility analyst is to "...make these assumptions

regarding context as explicit as possible and then test the form of the investment to that context..." (Graaskamp 1972: 521).

This broad definition of real estate analysis was incompatible with the evolving new paradigms for academic real estate, for reasons discussed in connection with the replacement of ULE by urban economics. Despite this presumed irrelevance to academic research, Graaskamp's ideas exerted powerful attraction. As a guide to practice, or as a purely intellectual device, it attracted substantial interest in both its published versions (1970 and 1972). Graaskamp's model served as the basis for the multidisciplinary approach to real estate. For example, this approach has been adopted and advocated by the Urban Land Institute through programs to enrich real estate education.

### **III. The Meaning of Rigorous Research**

Certain aspects of the notion of rigor in academia are spotlighted by Graaskamp's work and by the differential assessment of that work. Important issues are his emphasis on problem definition and a thorough questioning of key assumptions.

The ultimate question for real estate academics is how we should act as scholars in a professional field? The quality of scholarship in real estate is often measured by its degree of rigor, and the debate over appropriate methodology may be framed in terms of what constitutes "rigorous" research. Two definitions of rigor are offered here. The more common definition is based on the concept of precision; we can propose that this definition be broadened to include the concept of thoroughness.

#### **A. Rigor Defined as Precision**

Recourse to dictionary definitions could be illuminating. However, search through eleven different encyclopedias and dictionaries of economics and the social sciences turned up

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not one reference to either rigor or rigorous. Turning to standard dictionary definitions we find a definition with some uncomfortable associations. Webster's New Collegiate Dictionary lists five definitions of rigor that may be summarized as: harsh inflexibility, strictness, austerity, exactness, or rigidity and stiffness. The fourth definition, exactness, seems most relevant. The full definition given is: "4: strict precision: Exactness <logical>." The corresponding definition under rigorous is: "3: scrupulously accurate: Precise."

The pursuit of "rigor" has led many to define it as equivalent to formal mathematical expression. Problems formulated in mathematical statements are believed rigorous because they are more precise than verbal statements. They also lend themselves more directly to quantitative testing of hypotheses. The "strict" and "inflexible" notion of rigor is also consistent with the discipline exercised by a paradigm, especially in mature paradigms with an efficient and exclusive structure. Within this framework, deductive research is highly channeled and "rigorous".

Summarizing our interpretation, rigorous research is commonly defined as: a) deductive; b) strictly bound by rules of a paradigm; c) often mathematical; and d) precise. The notion of "precise" is troubling, as that calls for judgment about the suitable tolerance of measurements. Precise also raises questions about how underlying assumptions should be addressed in establishing a context for precision measurement.

### B. Rigor Broadened to Include Thoroughness

When used as a synonym for the quality of scholarship, rigor has additional meanings. Chief among these is "thorough"; the ULE tradition and Graaskamp's work in particular exemplify this concept. Rigorous research thoroughly addresses the subject. Dictates of good scholarship include demonstrating a thorough command of the existing literature. A

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thorough and exact analysis also requires an acknowledgement of key assumptions that underlie the precise measurements to be carried out. Finally, rigorous scholarship requires thorough questioning of the problem definition and the assumptions that surround it. For problem solving we may extend the definition of rigor to include comparison of alternative models and paradigms for addressing the problem.

One hallmark of thorough research directed at problem solving is close scrutiny of assumptions surrounding the analytical model. Graaskamp's inclusive problem solving approach becomes highly relevant here. Precisely formulated quantitative model, on the other hand, might quickly dispense with key assumptions--such as expected future market absorption or political constraints on new supply--as unknowables. In any event, these factors lay outside the bounds of "rigorous" research defined as precision and were not considered academically relevant.

A second hallmark of thorough research aimed at problem solving is the consideration of alternative problem definitions. Problems in real estate that involve real actors have special qualities: different actors have different views of the problem. Therefore, the researcher cannot stop his inquiry with his own thoughts on the problem but should extend his inventory of the various problem definitions to include those of real world actors. Through this rigorous inquiry, a richer set of problem definitions may be assembled as raw material for defining a single analytical definition. This broader set also provides vital clues for guiding the data search surrounding a problem. In contrast to the thorough approach, the commonly accepted concept of rigorous research (i.e., "precision") tends toward an inflexible problem definition that is preordained by the nature of existing theory.

Rigorous and thorough scholarship requires comparison of alternatives. Extensive literature reviews provide one means of comparison utilized by the urban land economics

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tradition. Of great importance to academic credibility, external references to supporting authority must be invoked to substantiate the analyst's judgment about what issues are relevant. Evaluation of the assumptions underlying different models are a second. A third basis of comparison used by Graaskamp requires alternative problem definitions. A fourth, and final, means of comparison also used by Graaskamp, requires execution of multiple methods of measurement with different sets of data. This may necessitate the flexibility to consider the value of multiple paradigms. Rather than rely on faith that a particular paradigm and a given method is well suited to a problem, rigorous research for problem solving questions which paradigm and which method is best.

Taking a broad view of academia as a whole, there are essentially two prevailing views of research. The "science view" includes the natural sciences, mathematics, statistics, finance and much of economics. Their understanding of rigor would correspond to the "precision" definition. But most academics in the social science and humanities, including related fields in economics and business, would define rigor as "thoroughness." Given the fact that real estate falls between the sciences and social sciences, then both definitions can apply equally depending upon the particular problem at hand.

In sum, the commonly accepted interpretation of rigor emphasizes precision. We propose adding emphasis on thoroughness; i.e., we propose a broader concept that includes generally accepted standards of scholarly research; Graaskamp and the urban land economics tradition exemplify many aspects of this other half of rigor.

## **IV. The Research Continuum and Graaskamp's Problem-Solving Approach**

Academic research in real estate covers a broad spectrum from pure theory to highly applied work. While the continuum from basic to applied research is well known, the

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relationships among parts of the continuum are not well understood. For example, those doing pure theory are unlikely to think of themselves in relationship to those doing applied research. Conversely, those doing empirical research often ignore theory, feeling that it is overly restrictive and irrelevant.

We propose that research process be viewed by all involved as a complex of interrelated parts. In our view, the ultimate justification for real estate research is application to problem solving relevant to public and private decision-makers. This view represents one of the major tenets of the ULE tradition and of Graaskamp's work in particular. An important implication of this view is that those doing pure theory, and those working in the middle of the continuum to bridge from theory to applications, should be fully aware of the applied research. This implies that they would view their work as contributing indirectly to better problem solving. Thus, problem solving and theory development would become two sides of the same coin.

As an example, consider the development of theory on one of the major real estate paradigms: hedonic pricing theory. This theory was developed by Lancaster, Ironmonger, and Rosen as an extension of the competitive market paradigm to products with multiple attributes. Thus, it was viewed as relevant for understanding the complex commodities that have come to characterize the modern economy.

While we agree with the original motivation for hedonic pricing theory, we are concerned with the lack of development in a direction that would be helpful to problem solving. In real estate, many problems are related to negotiations between sellers and buyers or landlords and tenants. For example, lease terms need to be understood as a result of this negotiation process. But, hedonic regression methodology has been applied to these issues without adapting

the theory to the problem at hand. Thus, we have a theory based on competitive market assumptions being applied blithely to problems with a very different market structure.

We think that the problem here is the lack of a unifying concept of the role of theoretical and applied research. If the theoreticians viewed themselves as related to a process based on problem-solving, they would be more likely to respond with appropriate theory. If the people doing applied research also viewed themselves as part of a process, they would be less likely to cloak their research in the garb of rigorous theory. Instead, they would be more likely to point out the need to adapt the theory to the problem. Specific suggestions from the applied researchers could be very useful to the theoreticians. Thus, the entire spectrum from basic to applied research could work as a unified whole.

Figure 1 summarizes our view of rigorous research applied to problem solving. The Theory column illustrates the research continuum from pure theory to applied problem solving, whereas the Empirical Methodology column illustrates rigorous research methods. Turning to the theory side, we have simplified the continuum into three layers. An important part of our thesis is that ideas should be communicated in both directions between each layer of the rectangle (indicated by double-ended arrows).

In our view, the research process begins at the foundation of the column, with a problem confronted by public or private decision-makers. In the tradition of Graaskamp, the researcher carefully defines the problem so as to include all relevant aspects: A broad inclusive approach is required here. For example, if institutional characteristics are an important part of the problem, then it is up to the researcher to point this out.

Next, the researcher should select methods that are most appropriate for making progress on the problem. These methods might be drawn from other disciplines; e.g., focus groups might

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be needed to determine management style or corporate personality, provided that this is an important part of the problem. The applied researcher draws on theory and statistical methods where possible (the arrow pointing toward applied problem-solving).

When the applied researcher finds theory or statistical techniques inadequate, this should be communicated "upward" to those developing theory and testing hypotheses. An important part of our thesis is a willingness to exchange information. Those doing applied work should be able to communicate their needs, with some specificity, to those doing "higher level" theory and statistical work. This is a two-sided exchange requiring the willingness to initiate communication and the willingness to listen.

In the middle of the column, those testing theory and developing new hypotheses are bridging between higher and lower levels. They should be able to understand theory and statistical methodology so that they can test hypotheses. More importantly they need to exchange information within the continuum. These researchers are analogous to wholesalers who communicate information about demand to manufacturers (analogous to the pure theory level) and communicate information about new products (and changes in products) to retailers (analogous to the applied problem solvers).

Turning to the empirical side of Figure 1, the most important idea is to include Graaskamp's "thoroughness" along with mathematical and statistical tools. Rigorous methodology is able to strongly differentiate high and low quality research. This is done partly by evaluating the mathematical and statistical tools used, as well as by evaluating the degree of thoroughness of the research. Thorough research can be recognized by the care with which data are handled, by extensive evaluation of the literature, the appropriateness of the method to the

problem, by complete assessment of assumptions and by the use of more than one tool (e.g., tools from other discipline).

### **V. Summary**

James A. Graaskamp was focused throughout his career on teaching students and real estate professionals. He did not seek, nor obtain, recognition as an outstanding academic researcher. But he did make a significant contribution to the urban land economics (ULE) tradition.

ULE is oriented towards applied problem solving using inductive and interdisciplinary techniques that recognize the importance of institutions. ULE emphasizes the site location of a real estate property, analyzing its economic function, and value, in a broad, holistic framework. ULE was developed in the United States by Ratcliffe and by his students, including Graaskamp.

Graaskamp distinguished himself from Ratcliffe by his emphasis on entrepreneurship, risk management and the physical real estate product. Graaskamp made contributions on the use of the computer to assist complex decision-making. Also, he emphasized problem definition -- including investor behavior and logic -- as part of real estate appraisal. He was most influential in his advocacy for total, not just economic, project feasibility analysis. According to Graaskamp, financial and market feasibility can only be evaluated in the context of client objectives and numerous constraints (e.g., legal, ethical and technical).

In the 1950's and '60s, academic institutions adopted a deductive analytical paradigm that became known as urban economics. Urban economics emphasized mathematical models and modern tools for statistical analysis. The hallmark of urban economics is rigorous research as defined by mathematical and statistical precision. The paradigm shift from ULE to urban

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economics was stimulated and reinforced by broader changes occurring throughout the social sciences.

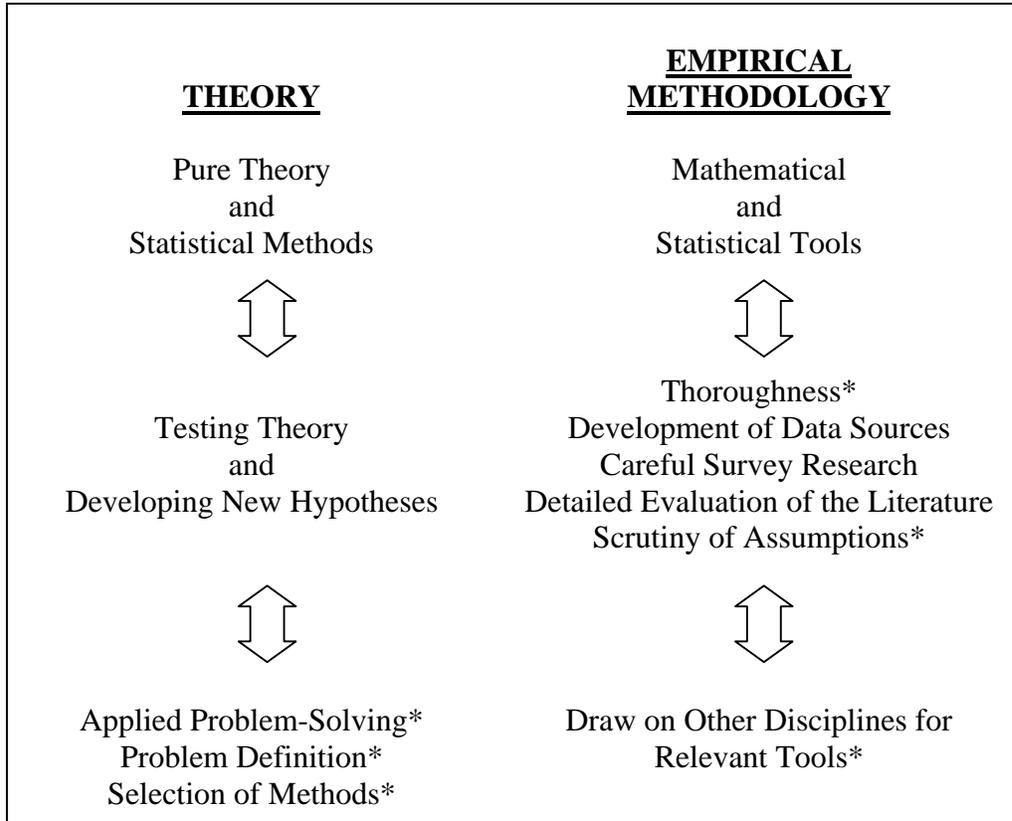
Graaskamp and the ULE tradition represent another kind of rigorous research: One that champions thoroughness. Thorough research can be characterized by extensive problem analysis and literature review; careful evaluation of assumptions, including simplifying assumptions; alternative (inclusive) methods for problem solving; and/or multiple methods of measurement with possible inclusion of survey research approaches.

Rigor defined as thoroughness needs to supplement rigor defined as precision because research takes place on a continuum from pure theory to applied problem solving (Figure 1). An important implication of this view is that those doing pure theory, and those working in the middle to bridge from theory to applications, should be fully aware of the applied end of the spectrum: these researchers would view their work as contributing indirectly to better problem solving. Likewise, those on the applied end would integrate some of the best theoretical and empirical tools into their analysis. Thus, problem solving and theory development would become complementary, cooperative efforts rather than being isolated from each other.

We have argued that political and economic forces are driving real estate research toward the concepts illustrated in Figure 1. The complexities of modern economics require attention to applied problem solving and diverse research methodology. Thus, it is time to take a fresh look at Urban Land Economics and at the research philosophy espoused by James A. Graaskamp.

**FIGURE 1**

**Rigorous Research and Applied Problem Solving**



\* James A. Graaskamp made contributions to these areas.

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