

Lessons from the Past and Future Directions for Corporate Real Estate Research

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Abstract

This study seeks to answer several questions about corporate real estate research. The first, Where should corporate real estate research be focused in the future? is addressed by a proposed alternative corporate real estate research framework that differs from what has been followed in the past. A second question that follows from the first is then addressed: Given such an alternative research framework, what types of corporate real estate issues merit research consideration? Finally, a third closely related question is then examined: Which research methodologies, databases and statistical tools are likely to prove useful to academic researchers seeking promotion and tenure, as well as corporate executives and others interested in better understanding the impacts of corporate real estate decisions?

Introduction

Academic real estate researchers have an implied responsibility to provide thought leadership for their subject area in order to further the state of knowledge in their field. Given the nature and level of academic corporate real estate research from 1989 to 1999 (Manning and Roulac, 1999), there appears to be a need for corporate real estate researchers within the academy to reassess their priorities. More specifically, these researchers may wish to consider providing more prescriptive thought leadership as part of their future research plans. Diaz (1993) labels the creation of real estate knowledge as *science*, contrasted with the prescriptive, useful, application of knowledge as *engineering*. He further indicates that both are necessary aspects of an applied discipline such as real estate. He states that “in the long run, the needs of the served constituency shape an applied discipline, such as real estate, and no applied discipline can long ignore its constituents and survive. The engineering dimension to the real estate discipline is thus crucial,” Diaz (1993:192).

The evolution of marketing as a discipline offers additional guidance for the direction of future corporate real estate research. Hunt (1991:13) acknowledges

Kotler for bringing some order to modern marketing theory in 1972, when Kotler proposed his eight cell modern marketing paradigm, which among other things, distinguished *positive* (what actually is being done) from *normative* (what should be done) marketing research.

Manning and Roulac (1999) suggested that the following questions need to be asked within the academy: “Is there another corporate real estate research perspective (*i.e.*, research framework), other than the historically narrow one largely drawn from the finance discipline, which may better serve the interests of corporate real property executives and professionals, as well as college of business faculties?” Another question: “Given such an alternative research framework, what corporate real estate issues merit research consideration?” further implies a third question: “Given the issues which merit research consideration, which research methodologies, databases, and statistical tools are most likely to prove useful?”

This study addresses all three of the above questions by first proposing a broader alternative corporate real property management perspective, which is intended to simultaneously serve the interests of senior management, corporate real property management professionals and university faculty interested in doing research in this area. Following this, a number of research issues that corporate real property executives and other corporate real property experts have expressed an interest in being researched, are explored. In addition, the prior corporate real estate research published in real estate and finance academic journals as defined by Webb and Albert (1995) from Fall, 1989 to 2001, is reviewed in terms of (1) the broader corporate real estate management perspective and (2) the research methodologies, databases and statistical tools used. Lastly, alternative research methodologies that are most likely to advance the corporate real estate discipline, and thus better serve the interests of both managers and academic researchers in the future, are discussed.

Alternative Corporate Real Estate Research Directions

One vein of corporate real estate research follows from an emerging direction of corporate real estate management discussed since 1990 in the literature (Hoffman, Schniederjans and Sirmans, 1990; Nourse, 1992, 1994; Arthur Andersen, 1993; Nourse and Roulac, 1993; Apgar, 1995; Becker and Joroff, 1995; Roulac, 1995, 1999; Lambert, Poteete and Waltch, 1995; Manning and Roulac, 1996, 1999; Manning, Rodriguez and Roulac, 1997; Carn, Black and Rabianski, 1999; Manning, Rodriguez, and Ghosh, 1999; and O’Mara, 1999). This literature observes that corporate real estate management embraces external and internal dimensions, as well as both business concerns and real estate concerns. The external dimensions involve a company’s customers, competitors and real estate markets, while internal dimensions involve business operations, human resources, information technology and a company’s real estate support services (Materna and Parker, 1998).

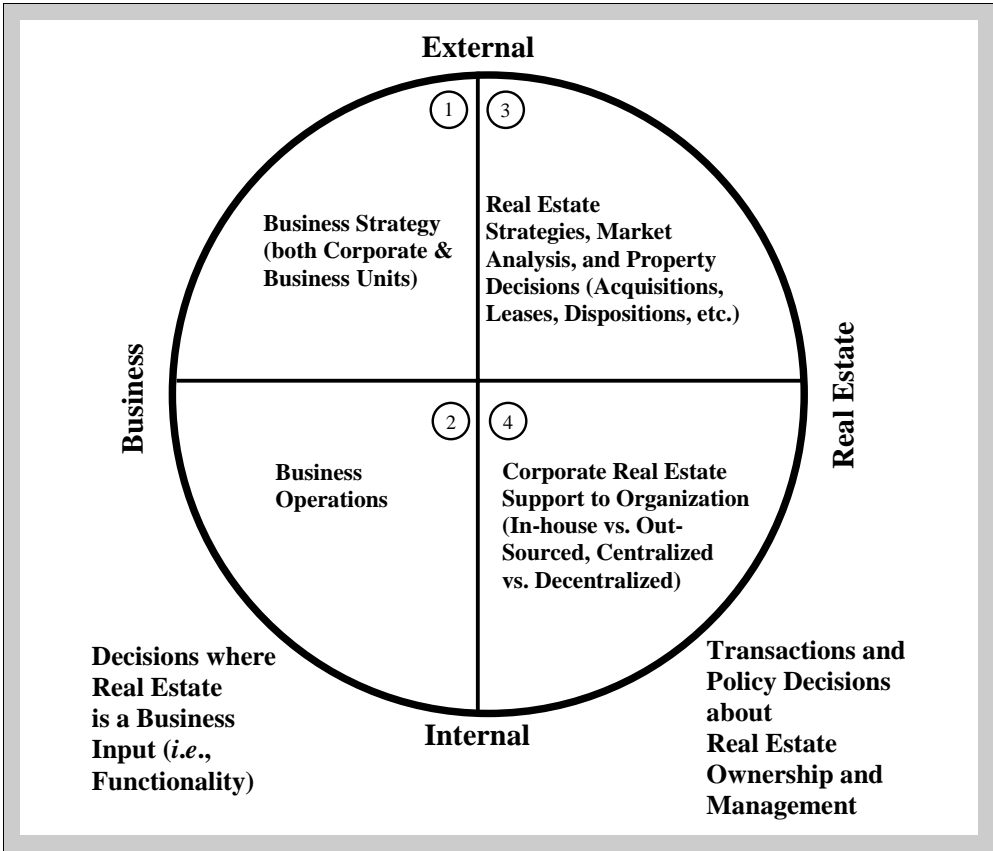
The closer the corporate real estate management function is linked to long-term overall corporate objectives, the greater will be its relevance and impact on business operations. Corporations in the past have pursued real property management decisions that, all too often, have not been congruent with their overall business strategy and objectives. This has been partly due to the more internal, than external, orientation of the real property management function within companies. But it has been more the result of most past real property decisions being made at middle management levels, with middle management not giving sufficient thought to the overall goals of the enterprise. For corporate real estate research to be most useful in the future to corporate property executives and professionals, and also be relevant to senior management, it must address the concerns of senior management. Thus, extending the real estate perspective within companies upstream to embrace the enterprise's overall corporate and real estate strategies should be a crucial consideration in determining priorities of corporate real estate research (Nourse and Roulac, 1993).

Over the past decade, corporate real property management responsibilities have continued to broaden and become more complex in order to keep up with changing environmental conditions, increased rates of change and increased globalization,¹ as well as increased corporate real estate management knowledge (Raney, 1990; Apgar, 1995; Lambert, Poteete and Waltch, 1995; Bell, 1997; Materna and Parker, 1997, 1998; Manning, Rodriguez and Ghosh, 1999; and Schaefers, 1999). This increased complexity and broadening of corporate real property management has partly resulted from real property managers inventing better ways to pursue diverse, and often conflicting, company goals (*e.g.*, operating efficiency vs. real property investment return; dispersed local real property management responsibility vs. centralized expertise and control; cost saving long-term space commitments vs. risk reducing space flexibility; etc.). But this broadening and increased complexity in corporate real property management responsibility has also resulted from senior management of companies seeking: (1) operating efficiencies through corporate restructuring (*e.g.*, mergers, divestitures, downsizing, etc.), as well as facility relocations; (2) market expansion (international, number of products and services offered existing customers, etc.); and (3) integration of technology, cultural diversity and other changes into existing operations.

Thus, it is suggested that an attractive alternative to the narrow financial corporate real estate research perspective employed by many faculty (Manning and Roulac, 1999) would be a broader perspective that includes not only the traditional financial focus, but also an explicit *business*, as well as *real estate*, focus, with both *external* and *internal* dimensions as part of an integrated corporate real property management paradigm. This alternative corporate real estate management framework (see Exhibit 1) builds on the business strategy-real estate strategy-implementation sequence of corporate real property management decisions advanced by Nourse and Roulac (1993).

Quadrant 1 of Exhibit 1 includes corporate real property management issues and hypotheses related to business strategy, organizational culture, marketing strategy,

Exhibit 1 | Proposed Corporate Real Estate Management and Research Framework



international trade (e.g., political, legal, taxation, transfer pricing), etc. at both the corporate and individual business unit manager levels. Quadrant 2 includes corporate real estate research investigation of existing operational issues and hypotheses related to achieving productivity and quality enhancements at the overall corporate, as well as business unit levels. Quadrant 2 would include research on long-term aggregate cost minimization, internal organizational efficiency (e.g., operations, human resources, corporate culture, MIS, finance, support to business unit managers, etc.), achieving local environmental goals (e.g., land use regulations, local community involvement, etc.), along with total product and service profitability, quality and production efficiency. Research in this quadrant could enhance internal real property business consulting support to existing operations and be helpful throughout the organization at all levels as to site/space choices and commitments. Whereas Quadrant 1 issues have more to do with planning and preparation for long-term change; Quadrant 2 issues relate to the company’s site/space reactions to its current operating needs, operating opportunities and preparation for near term change.

This broader management and research framework also includes a broader perspective for corporate real estate portfolio management and research (the right half of Exhibit 1) than has been evident in the past. Quadrant 3 includes investigation of issues and hypotheses concerning individual property site/space procurement and management, overall corporate real property portfolio management and maintenance of an overall real estate strategy. Quadrant 3 research would also explore how real estate space availability and real estate market trends are likely to impact on a company's long-term business unit profitability and corporate strategies. Real property management in this quadrant takes into account corporate needs to rapidly expand or contract businesses.

Quadrant 4 includes issues related to providing real estate services at all organizational levels (*e.g.*, expertise, transaction execution, etc.) whether outsourced or not, as well as real estate database and decision systems within an integrated corporate-wide management decision support framework. Quadrant 4 includes research on issues related to the benchmarking of corporate real property services against best of class of comparable support. Quadrant 4 research on corporate real property decision making processes also includes greater breadth than at present on topics that would benefit outsource professionals as well as corporate real estate executives (*e.g.*, Cameron and Duckworth, 1995; and O'Mara, 1997). While corporate real property management knowledge and responsibility have broadened considerably over the past decade, the currently predominant narrow financial academic research perspective has focused mainly on only a small part of Quadrant 3 issues² and a few issues in Quadrant 4.³

Around 1990, a significant broadening of the narrow financial academic corporate real estate research perspective was accomplished through IDRC's Corporate Real Estate 2000 project. This was achieved partly by IDRC contracting for this research with university faculty, non-faculty researchers and consultants from disciplines other than finance [*e.g.*, Duckworth (1993) from a planning and control systems background, Joroff (1992, 1993) from architecture; and Joroff, Louargand, Lambert and Becker (1993) from human ecology]. Under Joroff's (1992) lead, followed by Joroff, Louargand, Lambert and Becker (1993) and extended by Lambert, Poteete and Waltch (1995), this new breadth in corporate real estate research acknowledged the broadening of corporate real property management responsibility over the past quarter century by identifying the evolution of five stages of development among (corporate real estate) units of successively higher levels (*i.e.*, more impact upon shareholder wealth) of corporate real property management effort and responsibility. These five successively more valuable levels of corporate real property management, where "each successive level brings the real estate unit closer to the senior corporate management," were first summarized by Joroff, Louargand, Lambert and Becker, 1993:26–33) and are reproduced herein as Exhibit 2. "Each (corporate real property management) skill (or competency) that must be mastered cannot be abandoned in later stages; each stage (*i.e.*, level) builds upon the capabilities of prior stages," (Joroff, Louargand, Lambert and Becker, 1993).

Exhibit 2 | Corporate Real Estate Functions

Levels of Corporate Real Estate Management	Function
Taskmaster	Caretakers of existing space; procure and/or engineer cost-effective facilities
Controller	Standardize space needs to minimize facility occupancy costs
Dealmaker	Creative "space-needs" solutions; problem-solving and negotiation in regard to individual properties
Intrapreneur	Provide real estate services as a competitive service provider
Business Strategist	Integrate workforce, workplace and technology trends in overall business strategy

Source: Joroff, Louargand, Lambert and Becker, 1993:26–33.

Just as the “Taskmaster,” “Controller” and “Dealmaker” levels of corporate real property management capability discussed by Joroff, Louargand, Lambert and Becker (1993), and extended by Lambert, Poteete and Waltch (1995), reflect a broader perspective of Quadrant 3 than has traditionally been pursued by the academic community, the “Intrapreneur” level of corporate real property management reflects a broader perspective of Quadrant 4 than has traditionally been pursued by academic researchers.

Joroff, Louargand, Lambert and Becker’s (1993), “Business Strategist” corporate real property management perspective is represented by Quadrants 1 and 2 of Exhibit 1. Recently, the Industrial Development Research Foundation (IDRF) has adopted the broader term of “Corporate Infrastructure Resource Management” in place of “Corporate Real Estate Management” in order to better reflect corporate real estate management’s involvements in the company’s human resources, information technology and other corporate infrastructure functions that relate closely to its physical spaces and locations (Bell, 1997; and Materna and Parker, 1997, 1998).

Which Corporate Real Estate Issues Merit Research Consideration?

It is important to distinguish corporate real estate issues that merit research consideration from research methodologies likely to produce research useful to both senior management and corporate real property professionals, as well as publishable in refereed academic journals. Carn, Black and Rabianski (1999) provided future corporate real estate researchers with a list of thirty-nine research issues. Their study incorporated the opinions of eighteen corporate real estate

experts (consisting mainly of real property executives) on what trends and issues corporate real estate managers are most likely to face in the future. Carn, Black and Rabianski categorize their corporate real estate research issues under seventeen subheadings within five categories: (1) environmental; (2) corporate real estate organization and operational issues; (3) needed corporate real estate skills and training; (4) external corporate real estate providers; and (5) benchmarking. Their approach is potentially a good beginning for identifying industry relevant corporate real estate research issues. However, virtually all of the research issues would be quite difficult to undertake using the corporate real estate research approaches used by faculty since 1989.

An important objective of this study is to assist in bridging the gap between the motivation of faculty researchers and the need for useful corporate real estate research as put forth by Carn, Black and Rabianski (1999). Toward this end, it is useful to ask, What insights can be gained by comparing 1) the research agenda proposed by Carn, Black and Rabianski (1999; Appendix A) to 2) the topic areas of corporate real estate articles published by faculty since 1989 in terms of the diagram in Exhibit 1? To assist in making these comparisons, the thirty-nine research issues developed by Carn, Black and Rabianski are reproduced herein as Appendix A, along with a listing of corporate real estate articles published in select publications from 1989 to 2001 (Appendix B). The predominant topics of both listings have been categorized according to the relevant quadrant of the framework depicted in Exhibit 1.

Carn, Black and Rabianski's (1999) thirty-nine proposed research issues are mainly on topics mostly located within Quadrants 2 or 4 (internal issues), with many more falling into quadrant 4 (internal real estate) rather than quadrant 2 (internal business). The omission of the external perspective and concerns (*i.e.*, Quadrants 1 and 3) may suggest that Carn, Black and Rabianski's research issues are biased by being predominantly from the vantage point of the corporate real property executive, and do not reflect the perspective of senior management. Given the backgrounds of their eighteen corporate real estate experts, this would seem logical. This internal bias would suggest both a need to involve senior corporate management executives in future corporate real estate research and that there is an opportunity here for faculty to undertake corporate real estate research of more interest to senior management. For example, research could be undertaken that would seek to better link corporate real property databases, analytic tools and/or benchmarks to the key value drivers tracked by managers to enhance ROI, quality, productivity, etc.⁴

A comparison of Appendices A and B reveals that the topic areas of Carn, Black and Rabianski's (1999) proposed research issues contrast dramatically with the content of academic publications on corporate real estate from 1989 to 2001. These articles have primarily investigated Quadrant 3 and 4 issues (real estate) while mostly ignoring Quadrants 1 and 2 (business); whereas, Carn, Black and Rabianski's experts seek research in Quadrants 2 and 4. This most likely reflects the different faculty perspectives from that of corporate real property executives

and professionals interviewed as experts by Carn, Black and Rabianski. The emphasis on Quadrant 3 research from 1989 to 2001 is likely due to the narrow financial perspective that has dominated academic corporate real estate research until 1999 as suggested by Manning and Roulac (1999).

Academic corporate real estate research and publications from 1989 to 1999 have mostly investigated issues predominantly in either Quadrant 3 or 4 and used one of two research methodologies applied to similar data.⁵ Almost half of the nineteen articles that investigated predominantly Quadrant 4 issues during this period (corporate real property support to organization), surveyed corporate real property staff to collect and aggregate descriptive real property management information.⁶ Quadrant 3 issues (real estate strategies, market analysis and decisions) have been within a narrower range than those investigated in Quadrant 4. Seventeen of the twenty academic articles on issues predominantly in Quadrant 3 looked at the change in shareholder wealth related to some corporate real property action and relied on time series research methodology.⁷ In both instances, this research has more served the publishing interests and needs of faculty rather than the concerns of senior management or corporate real property professionals.

It is worth noting that nine of the seventeen academic articles on corporate real estate since 1998 have looked at Quadrant 2 issues, with seven of these appearing to also look at issues in Quadrant 1.⁸ Of the remaining eight articles, three investigated Quadrant 3 issues and none of these used time series methodology or looked at impact on shareholder wealth. These more recent articles suggest that academic research on operating and strategic business is indeed publishable, even when it does not employ research methodologies most familiar to reviewers with finance backgrounds.

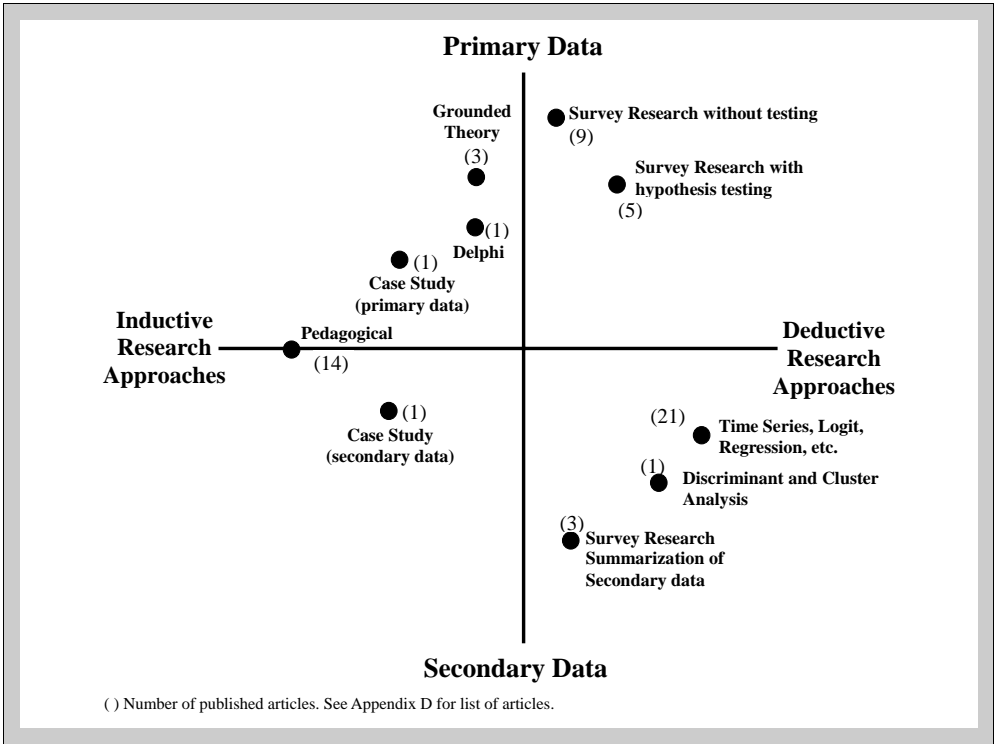
Corporate Real Estate Research within the Academy

For purposes of this study, academic corporate real estate research from 1989 to 2001 is defined as all corporate real estate publications appearing in either a real estate or finance academic journal (Webb and Albert, 1995) beginning with the first *Journal of Real Estate Research* special issue on this topic in Fall of 1989 and up to final acceptance in 2000 of the nine corporate real estate articles appearing in this issue. A summary of publication dates by each journal is provided in Exhibit 3. It is interesting to note that forty-six (78%) of the fifty-nine corporate real estate articles published during this period have appeared in the *JRER*, thirty-seven (63%) of which having appeared in one of the four *JRER* corporate real estate special issues (published in 1989, 1993, 1999 and 2001).

In order to assist thinking about which research methodologies, empirical tools and databases can produce a broader spectrum of corporate real estate research and still satisfy academic publication standards, the four-quadrant diagram depicted in Exhibit 4 should prove helpful. The vertical axis in Exhibit 4 contrasts research using *primary* data with research utilizing *secondary* data. Not only is it

Exhibit 3 | 1989–2001 Academic Journal Corporate Real Estate Articles

	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000–2001	Total
<i>Journal of Real Estate Research</i>	9	1	3	1	11	1		1	2		8	9	46
<i>Journal of Real Estate Literature</i>								1					1
<i>Journal of the American Real Estate and Urban Economics Association</i>		1	2	1									4
<i>Real Estate Economics</i> (Formerly the <i>Journal of the American Real Estate and Urban Economics Association</i>)							1						1
<i>Journal of Real Estate Finance and Economics</i>		1						1					2
<i>Journal of Urban Economics</i>							1						1
<i>Land Economics</i>													0
<i>Journal of Financial Economics</i>		1							1				2
<i>Journal of Finance</i>		1											1
<i>Journal of Financial and Quantitative Analysis</i>							1						1
Total Annual Articles	9	5	5	2	11	1	3	3	3	0	8	9	59

Exhibit 4 | Corporate Real Estate Body of Knowledge and Research Methodologies

cheaper and less time-consuming to gather and empirically test hypotheses with secondary data, but secondary data usually offers abundant characteristic information for a larger number of cases (*e.g.*, impact upon a company's stock price as a result of some real property related action, such as leasing, sale and leaseback, corporate headquarters relocation, acquisition or disposition, and corporate restructuring).⁹ In the past, academic corporate real estate researchers, who usually possess finance and/or economic backgrounds, have mostly used statistical tools (*e.g.*, time series, regression, chi square, etc.), which would be impressive to reviewers of prestigious refereed academic journals, to test hypotheses using secondary data.

The reviewers of these journals, who are generally the same types of academics as those doing this research, have tended to be more familiar with finance and economic research methods. As a consequence, studies that did not employ the familiar finance and economic research methods were unlikely to be positively reviewed, and therefore much less likely to be published. Unfortunately, there has been little incentive in the past to broaden reviewer standards.

Exhibit 4 depicts the horizontal axis as deductive research approaches (east), (more often used to test or apply existing theory), contrasted with inductive research

approaches (west), (more often employed to generate new theory)(Hunt, 1991).¹⁰ By depicting the domain of corporate real estate research in this way, it is possible to make interesting comparisons between different research methodologies in terms of: (1) secondary vs. primary data support, if any; (2) inductive vs. deductive research orientation; (3) degree of reliance upon existing theory in a particular field; (4) frequency of use in academic corporate real estate publications from 1989 to 2001; (5) their appropriateness for undertaking corporate real estate research of interest to corporate real estate executives and senior management; and (6) enabling university faculty concerned with promotion and tenure to have their research published in peer reviewed academic journals.

When a new sub discipline such as corporate real estate management begins, research methods need to aim first at providing inductive insights in order to develop a central body of generally accepted theory from which useful hypotheses can later be formulated. Once hypotheses and research questions can be posed in the context of an extant body of generally accepted theory, then secondary data can be used to empirically test new hypotheses using research methods more familiar to faculty with finance and economic backgrounds. But prior to the evolution of a body of generally accepted theory, researchers need to rely more on inductive research methods, often having to use more costly primary data.¹¹

In addition to corporate real estate management being a relatively new sub discipline in real estate, like most real estate research, it is also different in nature than either finance or economics research. Diaz (1993) compares the different natures of real estate and finance research when he says:

“Real estate as science is an example of a knowledge-seeking discipline lacking the focus of community consensus and therefore characterized by a slowly advancing knowledge base. There is a great variety [within and among real estate research sub disciplines] but less depth and progress. The discipline of finance as science presents an opposite case. Here a central theory and methodology (efficient market hypothesis and the capital asset pricing model) have been embraced by a community of researchers and knowledge generation has been rapid and deep. Yet knowledge generation has also been narrow (in finance) and increasingly esoteric so that the results of cutting-edge research in finance are available to an ever-shrinking few. There is, then, an apparent continuum of knowledge-seeking disciplines marked at one extreme by creative anarchy with its explosive variety and slow growth (*e.g.*, real estate) and marked at the other by central focus with its explosive growth and confining narrowness (*e.g.*, finance).”

Quadrants 1, 2 and 4 of Exhibit 1 have a lot to do with issues related to management, marketing, sociology and even psychology. Depending on the corporate real estate research question being investigated, research methodologies acceptable within these other disciplines (*e.g.*, management, marketing and sociology) will often be more appropriate to apply than those already familiar to

finance and economics faculty. For example, O'Mara's (1997) research on the location decision making processes of high technology companies, as well as her research (1999) on the relocation decisions of information-age companies, borrowed the grounded theory methodology from sociology in order to address the research questions posed by her research. While O'Mara's (1997, 1999) research focuses predominantly on Quadrant 4 corporate real estate management issues, her 1999 publication looks also at issues in Quadrants 1 and 2.

As mentioned, comparison of corporate real estate management theory and research to the evolution of marketing theory and research (Sheth, Gardner and Garrett, 1988; and Hunt, 1991), as well as overall real estate theory and research, also offers some insights and perspectives on how corporate real estate management might most effectively be researched in the future. Hunt (1991) has chronicled the ongoing debate within the marketing literature for many years over what the modern marketing paradigm should include within its discipline. Like the corporate real estate management and research framework depicted in Exhibit 1, modern marketing theory (Hunt, 1991) includes many diverse but related topics: consumer behavior, pricing, sales management, purchasing, marketing communications, packaging, channels of distribution, retailing, wholesaling, physical distribution, etc.¹²

Hunt (1991:13) credits Kottler (1972) for bringing some order to modern marketing theory when he proposed his eight cell modern marketing paradigm (similar in some ways to the framework in Exhibit 1). The three dimensions of Kottler's eight cells ($2 \times 2 \times 2 = 8$) are: (1) micro vs. macro; (2) profit vs. non-profit; and (3) positive (what actually is being done) vs. normative (what should be done).¹³ Kottler's new marketing paradigm (Hunt, 1991:13) recognized that modern marketing theory at that time had outgrown its earlier paradigm (dominant between 1920–1969) that was limited by the perspective of what a marketing manager (micro) actually did (positive) in a large manufacturing firm (for profit).

While the internal vs. external dimension of the framework in Exhibit 1 parallels Kottler's micro vs. macro dimension, Kottler's positive vs. normative dimension is implicit within all four quadrants of Exhibit 1. Thus, the new paradigm proposed herein implicitly includes both what corporate real property managers should be doing (*i.e.*, normative and prescriptive) as well as what they have actually been doing (*i.e.*, positive and descriptive). In addition, since only one of the fifty-nine corporate real estate articles between 1989 and 2001 have looked at corporate real estate management in the nonprofit sector (Simons, 1993), the profit vs. nonprofit dimension of Kottler's marketing paradigm is also considered to be implicit within all four quadrants of Exhibit 1. Thus, the much simpler diagram is possible in Exhibit 1 rather than requiring a complicated 16 quadrant diagram (which would be required if Kottler's additional two dimensions were shown explicitly).

Of particular interest during the evolution of modern marketing theory was the rise in popularity during the mid-1960s of the systems approach to marketing, which used the micro/profit/normative perspective while applying sophisticated

optimizing models (such as linear and dynamic programming) developed by operations researchers (Hunt, 1991). This earlier quantitative approach to marketing research parallels, in some ways, the heavily quantitative narrower financial and economic corporate real estate research perspective that dominated the academy from 1989 to 1999.

While in recent years, general agreement within the marketing discipline has been reached on a definition that includes all eight of Kotler's quadrants, marketing professionals (*e.g.*, executives) are interested primarily in the micro/profit/normative quadrant of marketing research (Hunt, 1991). The implication of this for future corporate real estate research is that, while the primary issues of interest to corporate real property professionals (Quadrants 2 and 4) may have been under-researched in the past by the academy, in favor of Quadrant 3, this does not mean that all future research has to be of immediate interest and useful to corporate real property professionals.

Hunt (1991) also distinguishes inductive research (which he calls theory discovery) from deductive research (which he calls theory justification), as he points out that both have been important in the evolution of disciplines such as psychology and sociology. Hunt suggests that development of new theory within humanistic disciplines such as sociology, psychology and marketing, must rely on inductive (*i.e.*, discovery) research approaches to connect their disciplines to the real world, before deductive research approaches can be applied to advance a new discipline from an art to being considered a true science (Hunt, 1991). In categorizing disciplines as more science vs. art, Hunt (1991:17) notes that the "label science is conferred upon a discipline only when the discipline has matured enough that it contains several central theories. Thus, physics achieved the status of a science before psychology, and psychology achieved it before sociology." Hunt concludes by pointing out that the marketing discipline should not have to wait to be labeled a science by others merely because it lacks an arbitrary requisite number of central theories.

When comparing economics to marketing, Hunt (1991:26) points out that "economic theory is perceived (by marketing theorists) to be deductive in nature. Economic theory is also often perceived (by marketing theorists) to be unrealistic and divorced from the real world." Hunt's point is not that economics is not a science, supported by justification for its system of beliefs, but that it is not perceived by many marketing professionals and academics as being relevant to either their needs or their discipline. Hunt (1991:26) further notes that while "there does exist a single logic of justification which is common to all science ... there is no single logic of discovery."

The lesson to draw from Hunt (1991) here is that the scientific research methodologies (*e.g.*, time series) applied by past academic corporate real estate researchers should not be discarded altogether, but that they need to be supplemented with more inductive (discovery) research methodologies, in addition to applying theory from other disciplines, in order to add relevance to future

corporate real estate research. This appears to be happening since 1997, and even more so since 1999.¹⁴ Many inductive research methods, while unfamiliar to many finance faculty, are respected within other academic disciplines where abundant secondary data or a central body of accepted theory did not exist when these disciplines first began evolving from art toward science. Thus, more academy use and broader acceptance of appropriate inductive research methods could simultaneously further corporate real estate research by: (1) meeting faculty publication and career needs; (2) producing useful knowledge for corporate real property executives; and (3) building the theoretical foundation from which corporate real estate research hypotheses and questions can later be asked and empirically tested with secondary data.

The fifty-nine corporate real estate academic articles listed in Appendix B and summarized in Exhibit 3, have been analyzed in order to ascertain research method, type of data and statistical tools used, if any, for empirical testing (see Appendix C). The methodologies underlying the research for these are classified and depicted in Exhibit 4, according to type of data used (primary vs. secondary data), as well as the generic underlying research approach (inductive vs. deductive). (Appendix D lists how each of the articles in Appendix C were classified for Exhibit 4.) Exhibit 5 summarizes the frequency of research methodology shown in Exhibit 4 by year of publication, as well as how many articles used primary vs. secondary data (or no data) and how many used a deductive vs. inductive research approach.

As indicated in Exhibits 4 and 5, these fifty-nine articles essentially employed one of ten research methodologies. Thirty-nine made use of deductive research approaches (more often used to test or apply existing theory), while the remaining twenty used inductive research approaches (more often used to generate new thinking or theory). Of these thirty-nine articles using deductive research, twenty-five based their research on secondary data, with seventeen using time series methodology to investigate how one of several corporate real estate decisions impacted shareholder wealth. The remaining fourteen articles used survey research methodology. While five of these fourteen articles empirically tested one or more research hypotheses, the other nine reported their survey results usually with only descriptive statistics and no empirical tests. It is interesting to note from Exhibit 4 that only three survey research articles employed secondary data while the authors of fourteen articles gathered their own primary data. The three survey research articles supported by secondary data have been located in the southeastern quadrant of Exhibit 4 along with the discriminant/cluster analysis and time series articles, but significantly further distant from the deductive research axis extreme as these three survey research articles are primarily descriptive in nature.

Variation among the fourteen primary data deductive research articles is so significant that it can be somewhat misleading to fix only two points within the northeast quadrant to represent them all. Primary data research can vary widely as to purpose, type of data gathered and the degree to which statistical tools are applied. Given the significant amount of subjectivity in how answers to survey

Exhibit 5 | 1989–2001 CRE Research Methodology and Type of Data by Year

	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000–2001	Total
Time Series, Logit, Regression, etc.	1	4	3	1	4		3	1	1		2	1	21
Discriminant and Cluster Analysis											1		1
Survey Research Summarization of Secondary Data					1			1				1	3
Total Deductive Research Approaches Using Secondary Data													25
Survey Research without Testing	3		1		2	1						2	9
Survey Research with Hypothesis Testing	2				1				1		1		5
Total Deductive Research Approaches Using Primary Data													14
Case Study (secondary data)	1												1
Total Inductive Research Approaches Using Secondary Data													1
Grounded Theory			1								1	1	3
Delphi											1		1
Case Study (primary data)					1								1
Total Inductive Research Approaches Using Primary Data													5
Pedagogical	2	1		1	2			1	1		2	4	14
Total Inductive Research Approaches Using Little or No Data													14
Additional Summaries													
Total Articles Using Secondary Data													26
Total Articles Using Primary Data													19
Total Articles Using Little Or No Data (Pedagogical)													14
Total Articles Using Secondary, Primary or No Data													59
Total Articles Using a Deductive Research Approach													39
Total Articles Using an Inductive Research Approach													20
Total Articles Using Either a Deductive or Inductive Research Approach													59

questions are categorized and aggregated to support an author's interpretations, it is appropriate to locate the nine survey research articles without empirical tests closer to the center of the diagram in Exhibit 4, but still within the northeastern quadrant (to reflect that this survey research is mainly deductive and based on primary data).

The twenty articles using an inductive research approach (see Exhibits 4, 5 and Appendix D) mostly relied on some form of case study research or else were pedagogical in nature, with no data collected. Only one article (Miles, Pringle and Webb, 1989) of these articles was supported by secondary data, while fourteen were pedagogical in nature without supporting data.

The remaining five articles (Manning, 1991; Duckworth, 1993; Carn, Black and Rabianski, 1999; O'Mara, 1999; and Gibson and Barkham, 2001) applied one of three inductive research approaches to primary data. The Carn, Black and Rabianski article relied on delphi methodology. Duckworth (1993) was supported by a single case study. The other three (Manning, 1991; O'Mara, 1999; and Gibson and Barkham, 2001) collected, synthesized and interpreted primary data gathered from companies in order to suggest new theories. While only two (O'Mara, 1999; and Gibson and Barkham, 2001) specifically referred to using grounded theory methodology, it appears that the research methodology underlying the third article (Manning, 1991) is not far different from sociology's grounded theory methodology as well.¹⁵

Grounded theory research has been located in the northwestern quadrant of Exhibit 4, as it makes use of primary data and also relies on the inductive (or intuitive) faculty of the researcher to select people to interview, interpret information gathered and formulate new hypotheses rather than to test earlier hypotheses. The two publications (Miles, Pringle and Webb, 1989; and Duckworth, 1993) that used a single company case study have been located in the western half of Exhibit 4 closer to the inductive research axis, since this work tends to be more pedagogical in nature and less reliant on either primary data (Duckworth, 1993) or secondary data (Miles, Pringle, and Webb, 1989). Single company case study research making use of primary data has been located further from the primary data axis than grounded theory and delphi research, because it relies on fewer observations (*e.g.*, interviews, company documents, etc.) and permits researchers more latitude for subjective case and data selection, description, and interpretation of information.

Useful insight and knowledge can be contributed to an emerging sub field through case study research. This research can identify the best of a class company in a particular area of investigation in order to compare the best of a class practice to standards prescribed (and/or described) in the literature and/or practiced in business. Duckworth's (1993) case study research on corporate real property planning and control systems was quite different (due to his planning and control system background) from the earlier article by Miles, Pringle and Webb (1989), who used secondary data to illustrate interactions among accounting, finance and real estate theory through financial modeling of the corporate real estate decision.

The fourteen pedagogical articles, where authors synthesized prior literature to support their own insights, should be located either directly on or near the inductive research axis extreme, since these articles draw heavily on the author's subjective interpretation of their knowledge on a particular topic. The more that pedagogical articles rely on primary data (northwest quadrant) or secondary data (southwest quadrant), the further they should be located from the inductive research axis.

Both pedagogical, as well as single company case studies, can be useful for suggesting new theory, which can later be confirmed, refuted or extended through inductive small sample survey research [*e.g.*, delphi (Carn, Black and Rabianski, 1999)] or grounded theory (Manning, 1991; O'Mara, 1997, 1999; and Gibson and Barkham, 2001) to develop and/or further advance theory within an emerging discipline. Following the theory generation effort of these inductive research approaches, deductive research approaches can then be applied to survey data (either primary or secondary) gathered on an even larger number of cases in order to test hypotheses generated through an inductive research approach. Thus, pedagogical, case study, grounded theory and delphi research can be, in the early stages of an area of study, publishable and useful in generating new theory.

Conclusion

Faculty interested in doing publishable corporate real estate research can choose from a broad range of topics (*e.g.* those in Appendices A, B or from the broader research framework put forth in Exhibit 1). A dramatic difference between Carn, Black and Rabianski's (1999) survey of research interests (Appendix A) and much of the prior corporate real estate literature from 1989 to 2001 (Appendix B) is that their thirty-nine research issues are seeking new ideas and theory (*i.e.*, prescriptive), not summaries of survey information or testing hypotheses with statistical procedures. Their survey results essentially address: How should corporate real estate managers do their jobs better and what should their future jobs become, given the needs of the company and opportunities that exist to integrate corporate real property management with corporate strategy and business unit decision making?

Exhibits 4 and 5, along with Appendices C and D, suggest that there now exists considerable academic publication latitude to permit innovative corporate real estate research based upon survey, grounded theory, delphi, case study and even pedagogical research methods. The IDRC CRE 2000 study series¹⁶ is based upon a combination of survey, case study and grounded theory research, all of which are excellent for gathering and synthesizing new corporate real property management ideas.¹⁷ Virtually all the CRE 2000 research has been based on primary data and is relevant to how corporate real property professionals conceptualize or do their work.

Faculty, with or without finance and/or economic backgrounds, can use their differing research skills, combined with a general business perspective, to help

address corporate real estate business issues (as indicated in Exhibit 1). General business related issues (both internal and external) can just as effectively be researched with inductive research methodologies as with deductive research methodologies. This type of research will provide knowledge that is of use and interest to senior corporate management, as well as corporate real property executives and academic peers.

Studies like this one may be helpful for other real estate sub disciplines, particularly when they are emerging (*e.g.*, cycles, international investment, portfolio management, REITs, computer applications, real estate education, etc.), to include studies of the prior professional literature as well as the academic, when doing so may provide guidance and/or inspiration to researchers.

Appendix A

Major Research Issues in Corporate Real Estate

Issues	Quadrant			
	1 External Business	2 Internal Business	3 External Real Estate	4 Internal Real Estate
Panel A: Corporate Environmental Issues				
Globalism and International Competition				
Issue #1: What aspects of global competition are foremost in evoking change within the corporate real estate function?				✓
Issue #2: How can corporate real estate operations deal more effectively with global changes to enable their core business to compete more effectively in international markets?		✓		
Impact on the Future Direction of Corporate Real Estate				
Issue #3: Should senior management or business units play the lead role in identifying the type, scale and timetable of responses needed with a technological or environmental change interrupts normal business operations? What role should the corporate real estate division play?		✓		
Issue #4: How can the corporate real estate division gain more control over staff and resource allocation to provide for greater flexibility in response?				✓
Panel B: Issues Arising from Internal Corporate Real Estate Organization and Operations				
Repositioning the Corporate Real Estate Function				
Issue #1: What corporate and core business characteristics should be primary considerations when senior management makes a decision to reorganize or restructure the corporate real estate function?				✓
Issue #2: Where is the best fit for the corporate real estate function within the corporate structure? What are the most reasonable alternatives for repositioning corporate real estate operations to more effectively respond to the needs of the core business?				✓

Major Research Issues in Corporate Real Estate (continued)

Issues	Quadrant			
	1	2	3	4
	External Business	Internal Business	External Real Estate	Internal Real Estate
Panel B: Issues Arising from Internal Corporate Real Estate Organization and Operations (continued)				
Impact of Technological Change				
Issue #3: Which aspects of technological change have the strongest impact on corporate space needs and occupancy characteristics, hence on corporate real estate operations?		✓		
Issue #4: What are the principal factors corporate space occupancy strategies need to deal with as a means of accommodating technological changes impacting the workplace environment?		✓		
Role of Corporate Real Estate in Corporate Activities				
Issue #5: What is the mission of the corporate real estate division? What are the principal types and levels of services the corporate real estate group needs to deliver to the corporate client?				✓
Issue #6: What type of role should the corporate real estate division play in (1) the corporate strategic planning process; (2) in developing a business plan for individual business units; and (3) in preparing an operating plan for the corporate real estate function?				✓
Relationship with Senior Management				
Issue #7: What is the optimum type of relationship the corporate real estate executive should have with senior management?				✓
Issue #8: What techniques should the corporate real estate executive employ in trying to achieve an optimal relationship with senior management?				✓
Role of Corporate Real Estate Executives and Managers				
Issue #9: Which foremost management principles and techniques should the corporate real estate executive employ in directing the corporate real estate operations?				✓
Issue #10: What leadership role, if any, should the corporate real estate executive play on a corporate-wide basis to most effectively deliver corporate real estate services?				✓

Major Research Issues in Corporate Real Estate (continued)

Issues	Quadrant			
	1 External Business	2 Internal Business	3 External Real Estate	4 Internal Real Estate
Panel B: Issues Arising from Internal Corporate Real Estate Organization and Operations (continued)				
Goals for Corporate Real Estate				
Issue #11: What are the most essential personal and professional characteristics a corporate real estate executive should possess to effectively carry out the corporate real estate function?				✓
Issue #12: What is the ideal characterization of the corporate real estate division of the future, in five to ten years from today?				✓
Panel C: Corporate Real Estate Skill and Training Issues				
Strategic and Executive Skills Needed				
Issue #1: Which of the basic job skills needed by a corporate real estate executive — business and management skills, technical real estate skills and understanding new technologies — need to be emphasized in corporate real estate training programs?				✓
Issue #2: To train for a stronger strategic and operational role, what additional management techniques should corporate real estate embrace besides the traditional tools of total quality management?				✓
Issue #3: What types of training techniques should be employed to provide corporate real estate personnel with a better grasp of the legal and institutional environment involved in the international realm as global economic integration progresses?				✓
Issue #6: When and under what conditions should corporate real estate have a strong role in corporate strategic planning?				✓

Major Research Issues in Corporate Real Estate (continued)

Issues	Quadrant			
	1 External Business	2 Internal Business	3 External Real Estate	4 Internal Real Estate
Panel C: Corporate Real Estate Skill and Training Issues (continued)				
Technical and Operational Skills Needed				
Issue #4: How can more effective networks to provide better access and linkages for the core business with real estate resources be effectuated?				✓
Issue #5: Regardless of the current position of the corporate real estate function within the corporation, what methods can be employed for the corporate real estate executive to more effectively communicate and have access to senior management?				✓
Panel D: External Providers of Corporate Real Estate Services				
Decisions to Use External Service Providers				
Issue #1: What circumstances and factors should be assessed to ascertain when it is most appropriate to employ the different techniques of obtaining external provision of corporate real estate services (outsourcing versus outtasking versus strategic alliances or partnering)?				✓
Issue #2: How do strategic alliances or strategic partnering result in a better delivery of corporate real estate services? What is the impact of these techniques on outsourcing corporate real estate functions?				✓
Determining Impact of Outsourcing				
Issue #3: When and under what conditions is outtasking a more efficient or more appropriate technique to use than outsourcing a whole service program?				✓
Issue #4: What factors should be examined to determine the best technique for arranging an external service provider? To what extent are these factors industry-specific?				✓

Major Research Issues in Corporate Real Estate (continued)

Issues	Quadrant			
	1 External Business	2 Internal Business	3 External Real Estate	4 Internal Real Estate
Panel D: External Providers of Corporate Real Estate Services (continued)				
Issue #5: Which techniques of obtaining external service providers and reassignment of job responsibilities are most appropriate when internal control of the function is to be maintained? Which corporate real estate services are the most appropriate ones to relinquish internal control and outsource both the management and provision of the service?				✓
Issue #7: What are the principal adverse impacts on the corporate real estate division and the corporation when a firm becomes overdependent on outsourcing?				✓
Issue #11: How does corporate performance and profitability affect the need or desirability to outsource corporate real estate functions?				✓
Managing Outsourced Operations				
Issue #6: Is cost savings the principal objective in outsourcing? What other motives are equally compelling reasons to outsource?				✓
Issue #9: What assessment of a firm's core competencies needs to be conducted to ascertain the desirability of downsizing, rightsizing and outsourcing corporate real estate services?				✓
Issue #10: As the corporate agent responsible for the provision of corporate real estate services including outsourcing, what alternative roles within the corporation should the corporate real estate executive play? What proficiencies should the corporate real estate executive have in order to adequately carry out these roles?				✓

Major Research Issues in Corporate Real Estate (continued)

Issues	Quadrant			
	1 External Business	2 Internal Business	3 External Real Estate	4 Internal Real Estate
Panel E: Benchmarking Issues				
Strategic Benchmarking Concerns				
Issue #1: Are cost issues relatively more important as benchmarking targets than productivity and profitability issues? As a general rule, should benchmarking objectives be equally focused or aimed at a particular aspect of corporate real estate performance?				✓
Issue #2: What industry specific benchmarks and general corporate performance benchmarks are most meaningful in developing corporate real estate objectives and assessing corporate real estate performance?				✓
Issue #4: What are the advantages and disadvantages of using an unbiased and independent entity to identify and collect benchmarking data across firms in specifically defined categories?				✓
Use of Benchmarking in CRE Operations				
Issue #3: In making internal decisions, how should both internal needs of the company and benchmark results be balanced against one another?				✓
Issue #5: What principal considerations should the corporate real estate executive use to identify the appropriate action to take when benchmarking reveals a problem that needs to be addressed?				✓
Issue #6: What are the principal uniform definitions and standards needed to establish standardized measures of benchmark values of interest to corporate real estate managers?				✓
Relating Benchmarks to Corporate Goals				
Issue #7: What procedures and forms of analysis are needed to relate benchmark results to a company's needs and its specific situation?				✓
Impact on the Future Direction of Corporate Real Estate				
Issue #8: What procedures and forms of analysis are needed to relate benchmark results to a corporation's strategic planning activities?				✓

Appendix B

Academic Corporate Real Estate Articles 1989–2001

Article, Author(s), Journal and Publication Date	Quadrant			
	1 External Business	2 Internal Business	3 External Real Estate	4 Internal Real Estate
Albert, J. and W. McIntosh, Identifying Risk-Adjusted Indifference Rents for Alternative Operating Leases, <i>Journal of Real Estate Research</i> , 1989, Fall.			✓	
Allen, M. T., R. C. Rutherford and T. M. Springer, The Wealth Effects of Corporate Real Estate Leasing, <i>Journal of Real Estate Research</i> , 1993, Fall.			✓	
Alli, K., G. Ramirez and K. Yung, Corporate Headquarters Relocation: Evidence from the Capital Markets, <i>Journal of the American Real Estate and Urban Economics Association</i> , 1991, Winter.			✓	
Alvayay, J. R., R. C. Rutherford and W. S. Smith, Tax Rules and the Sale and Leaseback of Corporate Real Estate, <i>Real Estate Economics</i> , 1995, Summer.			✓	
Ambrose, B. W., Corporate Real Estate's Impact on the Takeover Market, <i>The Journal of Real Estate Finance and Economics</i> , 1990, 3:4.			✓	
Ball, J'N., R. C. Rutherford and R. Shaw, The Wealth Effects of Real Estate Spin-Offs, <i>Journal of Real Estate Research</i> , 1993, Fall.			✓	
Blackwell, D. W., M. W. Marr and M. F. Spivey, Plant-Closing Decisions and the Market Value of the Firm, <i>Journal of Financial Economics</i> , 1990, August.			✓	
Booth, G. G., J. L. Glascock and S. Sarkar, A Reexamination of Corporate Sell-Offs of Real Estate Assets, <i>Journal of Real Estate Finance and Economics</i> , 1996, March.			✓	
Brown, M. G., Choosing a Company's Building Design: Models for Strategic Design Decisions, <i>Journal of Real Estate Research</i> , 2001, Fall.	✓	✓		✓

Academic Corporate Real Estate Articles 1989–2001 (continued)

Article, Author(s), Journal and Publication Date	Quadrant			
	1 External Business	2 Internal Business	3 External Real Estate	4 Internal Real Estate
Carn, N., R. Black and J. Rabianski, Operational and Organization Issues Facing Corporate Real Estate Executives and Managers, <i>Journal of Real Estate Research</i> , 1999, 17:3.		✓		✓
Chan, S. H., G. W. Gau and K. Wang, Stock-Market Reaction to Capital Investment Decisions: Evidence from Business Relocations, <i>Journal of Financial and Quantitative Analysis</i> , 1995, March.			✓	
Christensen, D. G. and D. R. Levi, Corporate Restructurings Involving Real Estate Assets: Some Earnings and Risk Signal Implications, <i>Journal of Real Estate Research</i> , 1993, Fall.			✓	
Christensen, D. G. and D. R. Levi, Shareholder Wealth and Organizational Restructuring: Are Real Estate Master Limited Partnerships Different?, <i>Journal of Real Estate Research</i> , 1991, Winter.			✓	
Dasso, J., W. Kinnard and J. Rabianski, Corporate Real Estate: A Course Outline and Rationale, <i>Journal of Real Estate Research</i> , 1989, Fall.			✓	✓
Duckworth, S. L., Realizing the Strategic Dimension of Corporate Real Property Through Improved Planning and Control Systems, <i>Journal of Real Estate Research</i> , 1993, Fall.				
Elayan, F. A., The Announcement Effect of Real Estate Joint Ventures on Return to Stockholders: An Empirical Investigation, <i>Journal of Real Estate Research</i> , 1993, Winter.			✓	
Gale, J. and F. Case, A Study of Corporate Real Estate Resource Management, <i>Journal of Real Estate Research</i> , 1989, Fall.				✓
Ghosh, C., M. Rodriguez and C. F. Sirmans, Gains from Headquarters Relocations: Evidence from the Stock Market, <i>Journal of Urban Economics</i> , 1995.			✓	
Gibson, V. A. and R. Barkham, Corporate Real Estate management in the Retail Sector, <i>Journal of Real Estate Research</i> , 2001, 22:1 / 2.	✓	✓	✓	✓

Academic Corporate Real Estate Articles 1989–2001 (continued)

Article, Author(s), Journal and Publication Date	Quadrant			
	1	2	3	4
	External Business	Internal Business	External Real Estate	Internal Real Estate
Gibson, V. A. and C. M. Lizieri, Friction and Inertia: Business Change, Corporate Real Estate Portfolios and the U.K. Office Market, <i>Journal of Real Estate Research</i> , 2001, 22:1 / 2.	✓	✓	✓	✓
Glascocock, J. L., W. N. Davidson and C. F. Sirmans, An Analysis of the Acquisition and Disposition of Real Estate Assets, <i>Journal of Real Estate Research</i> , 1989, Fall.			✓	
Glascocock, J. L., W. N. Davidson III and C. F. Sirmans, The Gains from Corporate Selloffs: The Case of Real Estate Assets, <i>Journal of the American Real Estate and Urban Economics Association</i> , 1991, Winter.			✓	
Graff, R. A., Off-Balance-Sheet Corporate Finance with Synthetic Leases: Shortcomings and How to Avoid Them, <i>Journal of Real Estate Research</i> , 2001, 22:1 / 2.			✓	✓
Hoffman, J. J., M. J. Schniederjans and S. Sirmans, A Multi-Criteria Model for Corporate Property Evaluation, <i>Journal of Real Estate Research</i> , 1990, Fall.	✓	✓	✓	✓
Johnson, L. E. and T. Keasler, An Industry Profile of Corporate Real Estate, <i>Journal of Real Estate Research</i> , 1993, Fall.				✓
Johnson, L. E., A. L. Redman and J. Tanner, Utilization and Application of Business Computing Systems in Corporate Real Estate, <i>Journal of Real Estate Research</i> , 1997, 13:2.				✓
Kimbler, L. and R. C. Rutherford, Corporate Real Estate Outsourcing: A Survey of the Issues, <i>Journal of Real Estate Research</i> , 1993, Fall.				✓
Manning, C. A., Leasing Versus Purchase of Corporate Real Property: Leases with Residual Equity Interests, <i>Journal of Real Estate Research</i> , 1991, Spring.			✓	✓

Academic Corporate Real Estate Articles 1989–2001 (continued)

Article, Author(s), Journal and Publication Date	Quadrant			
	1 External Business	2 Internal Business	3 External Real Estate	4 Internal Real Estate
Manning, C. A., Managing Environmental Risk and Investment Opportunities to Maximize Shareholder Wealth, <i>Journal of Real Estate Research</i> , 1992, Summer.				✓
Manning, C. A. and S. E. Roulac, Structuring the Corporate Real Property Function for Greater 'Bottom Line' Impact, <i>Journal of Real Estate Research</i> , 1996, 12:3, 1996.				✓
Manning, C. A. and S. E. Roulac, Corporate Real Estate Research within the Academy, <i>Journal of Real Estate Research</i> , 1999, 17:3, 1999.				✓
Manning, C. A. and S. E. Roulac, Lessons From the Past and Chart Future Directions for Corporate Real Estate Research, <i>Journal of Real Estate Research</i> , 2001, 22:1 / 2.				✓
Manning, C. A., M. Rodriguez and S. E. Roulac, How Much Corporate Real Estate Management Should be Outsourced?, <i>Journal of Real Estate Research</i> , 1997, 14:3.				✓
Manning, C. A., M. Rodriguez and C. Ghosh, Devising a Corporate Facility Location Strategy to Maximize Shareholder Wealth, <i>Journal of Real Estate Research</i> , 1999, 17:3.	✓	✓	✓	✓
Miles, M., J. Pringle and B. Webb, Modeling the Corporate Real Estate Decision, <i>Journal of Real Estate Research</i> , 1989, Fall.				✓
Myer, F. C. N., L. T. He and J. R. Webb, Sell-offs of U.S. Real Estate: The Effects of Domestic Versus Foreign Buyers of Shareholder Wealth, <i>Journal of the American Real Estate and Urban Economics Association</i> , Fall, 1992.			✓	
Noha, E. A., Benchmarking: The Search for Best Practices in Corporate Real Estate, <i>Journal of Real Estate Research</i> , 1993, Fall.				✓

Academic Corporate Real Estate Articles 1989–2001 (continued)

Article, Author(s), Journal and Publication Date	Quadrant			
	1	2	3	4
	External Business	Internal Business	External Real Estate	Internal Real Estate
Nourse, H. O., Measuring Business Real Property Performance, <i>Journal of Real Estate Research</i> , 1994, Fall.	✓	✓	✓	✓
Nourse, H. O. and S. E. Roulac, Linking Real Estate Decisions to Corporate Strategy, <i>Journal of Real Estate Research</i> , 1993, Fall.	✓	✓	✓	✓
O'Mara, M. A., Strategic Drivers of Location Decisions for Information-Age Companies, <i>Journal of Real Estate Research</i> , 1999, 17:3.	✓	✓	✓	✓
Perrino, R. Spinoffs and Wealth Transfers: The Marriott Case, <i>Journal of Financial Economics</i> , 1997, February.			✓	
Pittman, R. and J. Parker, A Survey of Corporate Real Estate Executives on Factors Influencing Corporate Real Estate Performance, <i>Journal of Real Estate Research</i> , 1989, Fall.				✓
Prill, E. and E. Worzala, The Use of Geographic Information Systems by Corporate Real Estate Executives, <i>Journal of Real Estate Research</i> , 2001, 22:1 / 2.				✓
Rabianski, J. S., J. R. DeLisle and N. G. Carn, Corporate Real Estate Site Selection: A Community Specific Information Framework, <i>Journal of Real Estate Research</i> , 2001, 22:1 / 2.		✓		✓
Redman, A. and J. Tanner, The Financing of Corporate Real Estate: A Survey, <i>Journal of Real Estate Research</i> , 1991, Summer.			✓	✓
Redman, A. L. and J. Tanner, The Acquisition and Disposition of Real Estate by Corporate Executives: A Survey, <i>Journal of Real Estate Research</i> , 1989, Fall.			✓	✓

Academic Corporate Real Estate Articles 1989–2001 (continued)

Article, Author(s), Journal and Publication Date	Quadrant			
	1	2	3	4
	External Business	Internal Business	External Real Estate	Internal Real Estate
Rodriguez, M. and C. F. Sirmans, Managing Corporate Real Estate: Evidence from the Capital Markets, <i>Journal of Real Estate Literature</i> , 1996, January, 1996.			✓	
Roulac, S. E., Real Estate Value Chain Connections: Tangible and Transparent, <i>Journal of Real Estate Research</i> , 1999, 17:3.	✓	✓		✓
Roulac, S. E., Corporate Property Strategy is Integral to Corporate Business Strategy, <i>Journal of Real Estate Research</i> , 2001, 22:1 / 2.	✓	✓		✓
Rutherford, R. C. Empirical Evidence on Shareholder Value and the Sale-Leaseback of Corporate Real Estate, <i>Journal of the American Real Estate and Urban Economics Association</i> , 1990, Winter.			✓	
Rutherford, R. C. and R., Corporate Real Estate Unit Formation: Rationale, Industry and Type of Unit, <i>Journal of Real Estate Research</i> , 1989, Fall.				✓
Schaefers, W., Corporate Real Estate Management: Evidence from German Companies, <i>Journal of Real Estate Research</i> , 1999, 17:3.				✓
Seiler, M. J., A. Chatrath and J. R. Webb, Real Asset Ownership and the Risk and Return to Stockholders, <i>Journal of Real Estate Research</i> , 2001, 22:1 / 2.			✓	
Shilton, L. and C. Stanley, Spatial Patterns of Headquarters, <i>Journal of Real Estate Research</i> , 1999, 17:3.			✓	
Shilton, L. and C. Stanley, The Survival and Birth of Firms, <i>Journal of Real Estate Research</i> , 1999, 17:1 / 2.			✓	

Academic Corporate Real Estate Articles 1989–2001 (continued)

Article, Author(s), Journal and Publication Date	Quadrant			
	1 External Business	2 Internal Business	3 External Real Estate	4 Internal Real Estate
Simons, R. A., Public Real Estate Management-Adapting Corporate Practice to the Public Sector: The Experience in Cleveland, Ohio, <i>Journal of Real Estate Research</i> , 1993, Fall.				✓
Slovin, M. B., M. E. Sushka and J. A. Polonchek, Corporate Sale-and-Leaseback and Shareholder Wealth, <i>Journal of Finance</i> , 1990.			✓	
Toeh, W. K., Corporate Real Estate Management: The New Zealand Evidence, <i>Journal of Real Estate Research</i> , 1993, Fall.				✓
Veale, P. R., Managing Corporate Real Estate Assets: Current Executive Attitudes and Prospects for an Emergent Discipline, <i>Journal of Real Estate Research</i> , 1989, Fall.				✓

Appendix C

Research Methodologies, Statistical Tools and Databases Used by Academic Corporate Real Estate Publications 1989–2001

Article Citation, Research Methodology, Statistical Tool and Data Characteristics	PD	DRA	SD	IRA
Albert, J. and W. McIntosh, Identifying Risk-Adjusted Indifference Rents For Alternative Operating Leases, <i>Journal of Real Estate Research</i> , 1989, Fall. Pedagogical presentation of model accompanied by authors' illustration; no empirical tests.				✓
Allen, M. T., R. C. Rutherford and T. M. Springer, The Wealth Effects of Corporate Real Estate Leasing, <i>Journal of Real Estate Research</i> , 1993, Fall. Shareholder wealth time series event study supported by empirical tests using 1979–1991 CRSP secondary data on 67 lease announcements for 58 NYSE, AMES and NASDAQ firms.		✓	✓	
Alli, K., G. Ramirez and K. Yung, Corporate Headquarters Relocation: Evidence from the Capital Markets, <i>Journal of the American Real Estate and Urban Economics Association</i> , 1991, Winter. Shareholder wealth event, multiple regression, logit analysis, and matched paired <i>t</i> -tests applied to 1989 Compustat secondary data on 69 NYSE/AMEX firms and 43 NASDAQ firms reporting headquarters relocation announcements between Jan., 1980 and Dec., 1988.		✓	✓	
Alvayay, J. R., R. C. Rutherford and W. S. Smith, Tax Rules and the Sale and Leaseback of Corporate Real Estate, <i>Real Estate Economics</i> , 1995, Summer. Shareholder wealth event study supported by empirical test of a presented model using secondary CRSP data on 45 sale-leasebacks by NYSE or AMEX companies between 1982–1989.		✓	✓	
Ambrose, B. W., Corporate Real Estate's Impact on the Takeover Market, <i>The Journal of Real Estate Finance and Economics</i> , 1990, 3:4, 1990. A logit regression model supported by empirical tests applied to secondary 1981 CRST and COMPUSTAT data on samples of acquired and non-acquired non-regulated NYSE or ASE firms.		✓	✓	

Research Methodologies, Statistical Tools and Databases Used by Academic Corporate Real Estate Publications 1989–2001 (continued)

Article Citation, Research Methodology, Statistical Tool and Data Characteristics	PD	DRA	SD	IRA
Ball, J. N., R. C. Rutherford and R. Shaw, The Wealth Effects of Real Estate Spin-Offs, <i>Journal of Real Estate Research</i> , 1993, Fall. Shareholder wealth time series event study supported by empirical tests using 1968 to 1990 CRSP secondary data on real estate spin-off announcements for 39 NYSE, AMEX and NASDAQ firms.		✓	✓	
Blackwell, D. W., M. W. Marr and M. F. Spivey, Plant-Closing Decisions and the Market Value of the Firm, <i>Journal of Financial Economics</i> , 1990, August. Shareholder wealth event study supported by empirical tests using secondary CRSP data on 273 permanent plant-closings announcements of AMEX and NYSE companies from 1980 through 1984.		✓	✓	
Booth, G. G., J. L. Glascock and S. Sarkar, A Reexamination of Corporate Sell-Offs of Real Estate Assets, <i>Journal of Real Estate Finance and Economics</i> , 1996, March. Shareholder wealth event study supported by empirical tests using secondary CRSP data on 131 real estate acquisition (94) and divestiture (37) announcements (involving property or real estate divisions) from 1980 through 1989.		✓	✓	
Brown, M. G. Choosing a Company's Building Design: Models for Strategic Design Decisions, <i>Journal of Real Estate Research</i> , 2001, 22:1/2. Pedagogical discussion of building design processes that enable construction of key corporate buildings more consistent with appropriate real estate strategies tailored and focused as consistent support of a company's strategy.				✓
Carn, N., R. Black and J. Rabianski, Operational and Organization Issues Facing Corporate Real Estate Executives and Managers, <i>Journal of Real Estate Research</i> , 1999, 17:3. Delphi study in three stages gathering primary data from 18 corporate real estate "experts;" no empirical tests.	✓			✓
Chan, S. H., G. W. Gau and K. Wang, Stock-Market Reaction to Capital Investment Decisions: Evidence from Business Relocations, <i>Journal of Financial and Quantitative Analysis</i> , 1995, March. Shareholder wealth event study supported by empirical tests using secondary data on 447 business relocation announcements (206 for corporate headquarters relocations, 108 for subsidiary headquarters or unit office relocations and 133 for plant relocations) of NYSE, AMEX and NASDAQ companies from 1978 through 1990.		✓	✓	

Research Methodologies, Statistical Tools and Databases Used by Academic Corporate Real Estate Publications 1989–2001 (continued)

Article Citation, Research Methodology, Statistical Tool and Data Characteristics	PD	DRA	SD	IRA
Christensen, D. G. and D. R. Levi, Corporate Restructurings Involving Real Estate Assets: Some Earnings and Risk Signal Implications, <i>Journal of Real Estate Research</i> , 1993, Fall. Shareholder wealth time series event study supported by multiple empirical tests using 1984 and 1985 CRSP secondary data on an unspecified number of NYSE, AMEX and NASDAQ firms.		✓	✓	
Christensen, D. G. and D. R. Levi, Shareholder Wealth and Organizational Restructuring: Are Real Estate Master Limited Partnerships Different?, <i>Journal of Real Estate Research</i> , 1991, Winter. Shareholder wealth event study supported by empirical tests using secondary Compustat and CRSP data on 50 parent companies announcing formation of Master Limited Partnerships (13 MLPs with real estate assets and 37 non-real estate asset MLP formations).		✓	✓	
Dasso, J., W. Kinnard and J. Rabianski, Corporate Real Estate: A Course Outline and Rationale, <i>Journal of Real Estate Research</i> , 1989, Fall. Pedagogical discussion with authors' illustration; no empirical tests performed.				✓
Duckworth, S. L., Realizing the Strategic Dimension of Corporate Real Property Through Improved Planning and Control Systems, <i>Journal of Real Estate Research</i> , 1993, Fall. Pedagogical discussion of presented model illustrated using primary data taken from a case study of Digital Equipment Corporation; no empirical tests.	✓			✓
Elayan, F. A., The Announcement Effect of Real Estate Joint Ventures on Return to Stockholders: An Empirical Investigation, <i>Journal of Real Estate Research</i> , 1993, Winter. Shareholder wealth event study supported by empirical tests using secondary CRSP data on 139 firm (57 real estate and 82 non-real estate firms) which announced joint ventures between January, 1972 and December, 1989.		✓	✓	✓
Gale, J. and F. Case, A Study of Corporate Real Estate Resource Management, <i>Journal of Real Estate Research</i> , 1989, Fall. Survey research interviews of IDRC and/or NACORE real property executives at 30 companies in 15 industries; pedagogical reporting of corporate real estate management practices; methodology suggests grounded theory research.	✓	✓		

Research Methodologies, Statistical Tools and Databases Used by Academic Corporate Real Estate Publications 1989–2001 (continued)

Article Citation, Research Methodology, Statistical Tool and Data Characteristics	PD	DRA	SD	IRA
Ghosh, C., M. Rodriguez and C. F. Sirmans, Gains from Headquarters Relocations: Evidence from the Stock market, <i>Journal of Urban Economics</i> , 1995. Shareholder wealth event study supported by empirical tests using secondary CRSP data on 160 corporate headquarters relocations between 1966 and 1992.		✓	✓	
Gibson, V. A. and R. Barkham, Corporate Real Estate management in the Retail Sector, <i>Journal of Real Estate Research</i> , 2001, 22:1/2. Grounded theory 1998 retail industry survey of the practices and beliefs of corporate real estate executives at 27 large and diverse progressive U.K. retail chains; descriptive statistics presented as part of extensive pedagogical discussion; no empirical tests.	✓	✓		✓
Gibson, V. A. and C. M. Lizieri, Friction and Inertia: Business Change, Corporate Real Estate Portfolios and the U.K. Office Market, <i>Journal of Real Estate Research</i> , 2001, 22:1/2. Telephone questionnaire survey research with descriptive statistics reporting on primary data (organizational change, new work practices and new office technology impacts on corporate real property office portfolios over the previous 5-year period) gathered in 1997 from 45 progressive blue chip U.K. organizations (mostly private); additional interviews along with 3 focus group meetings attended by corporate users, developers and advisors provides additional support through grounded theory methodology for pedagogical discussion, interpretations and recommendations; no empirical tests.	✓	✓		✓
Gluscock, J. L., W. N. Davidson and C. F. Sirmans, An Analysis of the Acquisition and Disposition of Real Estate Assets, <i>Journal of Real Estate Research</i> , 1989, Fall. Shareholder wealth time series event study supported by empirical tests using 1981 through 1986 secondary CRSP data on 70 acquisitions and 9 divestitures.		✓	✓	
Gluscock, John L., Wallace N. Davidson III, and C.F. Sirmans, The Gains from Corporate Selloffs: The Case of Real Estate Assets, <i>The Journal of the American Real Estate and Urban Economics Association</i> , 1991, Winter. Shareholder wealth event study supported by empirical tests using secondary CRSP data on 99 acquisitions and 51 divestitures classified as real estate by Mergers and Acquisitions and Mergerstat for 1971–1986.		✓	✓	

Research Methodologies, Statistical Tools and Databases Used by Academic Corporate Real Estate Publications 1989–2001 (continued)

Article Citation, Research Methodology, Statistical Tool and Data Characteristics	PD	DRA	SD	IRA
Graff, R. A., Off-Balance-Sheet Corporate Finance with Synthetic Leases: Shortcomings and How to Avoid Them, <i>Journal of Real Estate Research</i> , 2001, 22:1 / 2. Pedagogical detailed discussion of financial risk associated with off-balance-sheet synthetic leases that can be addressed through innovative off-balance-sheet synthetic debt financing.				✓
Hoffman, J. J., M. J. Schniederjans, and Stacy Sirmans, A Multi-Criteria Model for Corporate Property Evaluation, <i>Journal of Real Estate Research</i> , Fall, 1990—Pedagogical discussion with author’s illustration; no empirical tests performed.				✓
Johnson, L. E. and T. Keasler, An Industry Profile of Corporate Real Estate, <i>Journal of Real Estate Research</i> , 1993, Fall. Descriptive statistical summary of secondary Compustat data on the real estate holdings (both by industry sector and asset subtype) of approximately 7,739 firms traded on one of the major organized stock exchanges during the 1984–1991 period; no empirical tests.		✓	✓	
Johnson, L. E., A. L. Redman and J. Tanner, Utilization and Application of Business Computing Systems in Corporate Real Estate, <i>Journal of Real Estate Research</i> , 1997, 13:2. Survey questionnaire research with descriptive statistics reporting on the primary data (i.e., types of computerized property data, reports, hardware, software, decision models and experts used by companies) gathered in 1993 from 179 NACORE, International real property executives; supplemented by ANOVA hypothesis testing.	✓	✓		
Kimbler, L. and R. C. Rutherford, Corporate Real Estate Outsourcing: A Survey of the Issues, <i>Journal of Real Estate Research</i> , 1993, Fall. Survey questionnaire research reporting on the 1990 primary data gathered from 53 real property executive IDRC members and 47 corporate real property service provider IDRC members; no empirical tests.	✓	✓		
Manning, C. A., Leasing Versus Purchase of Corporate Real Property: Leases with Residual Equity Interests, <i>Journal of Real Estate Research</i> , 1991, Spring. Grounded theory survey research (both face-to-face and phone interviews) of 30 real property executives and corporate real property service providers seeking new theory; no empirical tests performed.	✓			✓

Research Methodologies, Statistical Tools and Databases Used by Academic Corporate Real Estate Publications 1989–2001 (continued)

Article Citation, Research Methodology, Statistical Tool and Data Characteristics	PD	DRA	SD	IRA
Manning, C. A., Managing Environmental Risk and Investment Opportunities to Maximize Shareholder Wealth, <i>Journal of Real Estate Research</i> , 1992, Summer. Pedagogical discussion with author's illustration; no empirical tests performed.				✓
Manning, C. A. and S. E. Roulac, Structuring the Corporate Real Property Function for Greater 'Bottom Line' Impact, <i>Journal of Real Estate Research</i> , 1996, 12:3. Pedagogical synthesis and extension of corporate real estate literature; no empirical tests performed.				✓
Manning, C. A. and S. E. Roulac, Corporate Real Estate Research within the Academy, <i>Journal of Real Estate Research</i> , 1999, 17:3. Pedagogical discussion with some secondary data support; no empirical tests performed.			✓	✓
Manning, C. A. and S. E. Roulac, Lessons From the Past and Future Directions for Corporate Real Estate Research, <i>Journal of Real Estate Research</i> , 2001, 22:1/2. Survey research summarizing research methodologies and databases used by 59 academic corporate real estate articles published between 1989 and 2001; future directions for corporate real estate research suggested with pedagogical discussion and comparison to Carn, Black and Rabianski's (1999) delphi survey findings as well as the prior 59 CRE academic articles surveyed; no empirical tests.		✓	✓	✓
Manning, C. A., S. E. Roulac and C. Ghosh, Devising a Corporate Facility Location Strategy to Maximize Shareholder Wealth, <i>Journal of Real Estate Research</i> , 17:3, 1999—Shareholder wealth time series event study and regression supported by empirical tests using 1966–1995 secondary CRSP data on 182 corporate relocation announcements; plus significant pedagogical discussion partially supported by grounded theory survey research (both face-to-face and phone interviews).	✓	✓	✓	✓
Manning, C. A., M. Rodriguez and S. E. Roulac, How Much Corporate Real Estate Management Should be Outsourced?, <i>Journal of Real Estate Research</i> , 1997, 14:3. Pedagogical application of "theory of the firm" management literature; no empirical tests performed.				✓
Miles, M., J. Pringle and B. Webb, Modeling the Corporate Real Estate Decision, <i>Journal of Real Estate Research</i> , 1989, Fall. Pedagogical presentation of model followed by illustration with secondary 1986 data on Atlantic Richfield; no empirical tests.			✓	✓

Research Methodologies, Statistical Tools and Databases Used by Academic Corporate Real Estate Publications 1989–2001 (continued)

Article Citation, Research Methodology, Statistical Tool and Data Characteristics	PD	DRA	SD	IRA
Myer, F. C. N., L. T. He and J. R. Webb, Sell-offs of U.S. Real Estate: The Effects of Domestic Versus Foreign Buyers of Shareholder Wealth, <i>Journal of the American Real Estate and Urban Economics Association</i> , 1992, Fall. Shareholder wealth event study supported by empirical tests using secondary CRSP data on 48 real property asset sales to U.S. and foreign buyers.		✓	✓	
Noha, E. A., Benchmarking: The Search for Best Practices in Corporate Real Estate, <i>Journal of Real Estate Research</i> , 1993, Fall. Pedagogical summary and theoretical extension of LaSalle’s nine benchmarking studies between 1987 and 1993 of corporate real property management at over 60 Fortune 500 firms; no empirical tests performed.	✓	✓		✓
Nourse, H. O., Measuring Business Real Property Performance, <i>Journal of Real Estate Research</i> , 1994, Fall. Survey questionnaire research gathering primary data from a sample of senior corporate real estate executives at 11 companies with an overall bias toward linking their real estate strategy with business strategy. Few descriptive statistics, no empirical texts; but elements of “grounded theory” methodology supplemented by pedagogical interpretation.	✓	✓		✓
Nourse, H. O. and S. E. Roulac, Linking Real Estate Decisions to Corporate Strategy, <i>Journal of Real Estate Research</i> , 1993, Fall. Pedagogical discussion of corporate real property management decision framework; no empirical tests performed.				✓
O’Mara, M. A., Strategic Drivers of Location Decisions for Information-Age Companies, <i>Journal of Real Estate Research</i> , 1999, 17:3. Grounded theory research using 1995–1997 primary data gathered on 40 major relocation decisions of information age companies (<i>i.e.</i> , not manufacturing, retailing or distribution facilities); no empirical tests.	✓			✓

Research Methodologies, Statistical Tools and Databases Used by Academic Corporate Real Estate Publications 1989–2001 (continued)

Article Citation, Research Methodology, Statistical Tool and Data Characteristics	PD	DRA	SD	IRA
Perrino, R., Spinoffs and Wealth Transfers: The Marriott Case, <i>Journal of Financial Economics</i> , 1997, February. Shareholder and bondholder wealth event study of Marriott Corporation's October 1993, spinoff of its management businesses supported by empirical tests using secondary 1993 security price data on comparable securities of 6 similar hotel companies, in comparison to the secondary security price data on 13 of Marriott Corporation's senior note (and debenture) issues at the time as well as its common stock.		✓	✓	
Pittman, R. and J. Parker, A Survey of Corporate Real Estate Executives on Factors Influencing Corporate Real Estate Performance, <i>Journal of Real Estate Research</i> , 1989, Fall. Survey questionnaire research reporting on the primary data gathered in 1989 from 105 real property executive IDRC members; model of corporate real estate management effectiveness presented and empirically tested using OLS regression.	✓	✓		
Prill, E. and E. Worzala, The Use of Geographic Information Systems by Corporate Real Estate Executives, <i>Journal of Real Estate Research</i> , 2001, 22:1 / 2. Survey questionnaire research with descriptive statistics reporting on primary data (i.e., predominance of GIS usage; hardware, software, and data expenditures; types of data and its use in making decisions; availability of qualified GIS personnel; and importance of GIS to overall company mission) gathered in 1994 from 39% of the 82 NACORE International real property executives surveyed who used GIS; no empirical tests.	✓	✓		
Rabianski, J. S., J. R. Delisle and N. G. Carn, Corporate Real Estate Site Selection: A Community Specific Information Framework, <i>Journal of Real Estate Research</i> , 2001, 22:1 / 2. Comprehensive pedagogical discussion of the corporate facility site selection process to include a review of the literature, alternative approaches, an instructive model, listing of factors to be considered, and a review of both community and company-oriented supporting studies.				✓
Redman, A. L. and J. Tanner, The Financing of Corporate Real Estate: A Survey, <i>Journal of Real Estate Research</i> , 1991, Summer. Survey questionnaire research reporting on the primary data gathered from 218 corporate real property executives who are members of IDRC and/or NACORE International; no empirical tests performed.	✓	✓		

Research Methodologies, Statistical Tools and Databases Used by Academic Corporate Real Estate Publications 1989–2001 (continued)

Article Citation, Research Methodology, Statistical Tool and Data Characteristics	PD	DRA	SD	IRA
Redman, A. L. and J. Tanner, The Acquisition and Disposition of Real Estate by Corporate Executives: A Survey, <i>Journal of Real Estate Research</i> , 1989, Fall. Survey questionnaire research reporting on the primary data gathered from 92 real property executive NACORE International members; no empirical testing performed.	✓	✓		
Rodriguez, M. and C. F. Sirmans, Managing Corporate Real Estate: Evidence from the Capital Markets, <i>Journal of Real Estate Literature</i> , 1996, January. Survey research summarizing prior corporate real estate literature on how corporate real property management decisions have impacted shareholder wealth; no empirical tests.		✓	✓	
Roulac, S. E., Real Estate Value Chain Connections: Tangible and Transparent, <i>Journal of Real Estate Research</i> , 1999, 17:3. Pedagogical application of value chain management theory to corporate real property management decisions in order to suggest insights for marketplace competitiveness.				✓
Roulac, S. E., Corporate Property Strategy is Integral to Corporate Business Strategy, <i>Journal of Real Estate Research</i> , 2001, 22:1 / 2. Pedagogical discussion of how alternative real estate strategies contribute to different business strategies toward making a company more competitive.				✓
Rutherford, R. C., Empirical Evidence on Shareholder Value and the Sale-Leaseback of Corporate Real Estate, <i>Journal of the American Real Estate and Urban Economics Association</i> , 1990, Winter. Shareholder wealth event study supported by empirical tests using secondary CRSP data on 41 NYSE or AMEX firms completing sale-leasebacks of major facilities between 1980 and 1987.		✓	✓	
Rutherford, R. C. and R. Stone, Corporate Real Estate Unit Formation: Rationale, Industry and Type of Unit, <i>Journal of Real Estate Research</i> , 1989, Fall. Survey research reporting on the primary data gathered in 1988 from 82 real property executive NACORE International members; chi-square empirical tests performed.	✓	✓		

Research Methodologies, Statistical Tools and Databases Used by Academic Corporate Real Estate Publications 1989–2001 (continued)

Article Citation, Research Methodology, Statistical Tool and Data Characteristics	PD	DRA	SD	IRA
Schaefer, W., Corporate Real Estate Management: Evidence from German Companies, <i>Journal of Real Estate Research</i> , 1999, 17:3. Survey questionnaire research reporting on the primary data gathered from senior real property executives at 111 German companies about their real property management practices; empirical tests performed using cluster analysis and chi square.	✓	✓		
Seiler, M. J., A. Chatrath and J. R. Webb, Real Asset Ownership and the Risk and Return to Stockholders, <i>Journal of Real Estate Research</i> , 2001, 22:1 / 2. Shareholder diversification benefit study investigating whether higher levels of corporate real assets (to include real estate) contribute to higher risk-adjusted shareholder returns or lower systematic risk; two-stage OLS regression model empirical tests were performed using secondary quarterly Compustat data from 1985 through 1994 on 80 firms—20 firms randomly chosen from each of 4 industries.		✓	✓	
Shilton, L. and C. Stanley, Spatial Patterns of Headquarters, <i>Journal of Real Estate Research</i> , 1999, 17: 3. Cluster and discriminant analysis applied to secondary Compustat data on metropolitan headquarters locations (in 229 urban counties) of 5189 companies listed on the NYSE or AMEX, or reported by NASDAQ.		✓	✓	
Shilton, L. and C. Stanley, The Survival and Birth of Firms, <i>Journal of Real Estate Research</i> , 1999, 17:1 / 2. Regression analysis applied to 1997 secondary location data on 6,525 firm headquarters in 723 counties compared to secondary data on 1,455 firms in 366 counties whose headquarters “survived” within the same counties between 1986 and 1996.		✓	✓	
Simons, R. A., Public Real Estate Management-Adapting Corporate Practice to the Public Sector: The Experience in Cleveland, Ohio, <i>Journal of Real Estate Research</i> , 1993, Fall. Personal interview survey (54 questions) gathering primary data from municipal real property managers in twenty-one suburbs of the greater Cleveland, Ohio area; pedagogical discussion and comparisons suggesting elements of the grounded theory research approach; no empirical tests performed.	✓	✓		✓

Research Methodologies, Statistical Tools and Databases Used by Academic Corporate Real Estate Publications 1989–2001 (continued)

Article Citation, Research Methodology, Statistical Tool and Data Characteristics	PD	DRA	SD	IRA
Slovin, M. B., M. E. Sushka and J. A. Polonchek, Corporate Sale-and-Leaseback and Shareholder Wealth, <i>Journal of Finance</i> , 1990. Shareholder wealth event study supported by empirical tests using secondary CRSP data on sale-and-leaseback announcements of 59 facilities of NYSE and AMEX companies from 1975–1986.		✓	✓	
Toeh, W. K., Corporate Real Estate Management: The New Zealand Evidence, <i>Journal of Real Estate Research</i> , 1993, Fall. Survey questionnaire research reporting on the primary data gathered from senior executives at 66 New Zealand Stock Exchange companies; chi-square empirical tests performed using primary data on 41 companies.	✓	✓		
Veale, P. R., Managing Corporate Real Estate Assets: Current Executive Attitudes and Prospects for an Emergent Discipline," <i>Journal of Real Estate Research</i> , 1989, Fall. Survey questionnaire research reporting descriptive statistics on corporate real estate primary data gathered from executives at 284 organizations; pedagogical discussion and recommendations; no empirical tests performed.	✓	✓		

Notes: PD = Primary Data, DRA = Deductive Research Approaches, SD = Secondary Data, IRA = Inductive Research Approaches.

Appendix D

Academic Corporate Real Estate Articles from 1989 to 2001 Classified by Research Methodology, Statistical Tools and Type of Data

Deductive Research Approaches using Primary Data

Survey research without empirical testing (9): Gale and Case, 1989; Redman and Tanner, 1989; Veale, 1989; Redman and Tanner, 1991; Kimbler and Rutherford, 1993; Simons, 1993; Nourse, 1994; Gibson and Lizieri, 2001; and Prill and Worzala, 2001.

Survey research with empirical testing (5): Pittman and Parker, 1989; Rutherford and Stone, 1989; Teoh, 1993; Johnson, Redman and Tanner, 1997; and Schaefer, 1999.

Deductive Research Approaches using Secondary Data

Time series, logit and/or regression methodology (21): Glascock, Davidson and Sirmans, 1989; Ambrose, 1990; Blackwell, Marr and Spivey, 1990; Rutherford, 1990; Slovin, Sushka and Polonchek, 1990; Alli, Ramirez and Yung, 1991; Christensen and Levi, 1991; Glascock, Davidson and Sirmans, 1991; Myer, He and Webb, 1992; Allen, Rutherford and Springer, 1993; Ball, Rutherford and Shaw, 1993; Christensen and Levi, 1993; Elayan, 1993; Alwayay, Rutherford and Smith, 1995; Chan, Gau and Wang, 1995; Ghosh, Rodriguez and Sirmans, 1995; Booth, Glascock and Sarkar, 1996; Perino, 1997; Manning, Rodriguez and Gosh, 1999; Shilton and Stanley, 1999; Seiler, Chatrath and Webb, 2001.

Discriminant and cluster analysis (1): Shilton and Stanley, 1999.

Survey research summarization of secondary data (3): Johnson and Keasler, 1993; Rodriguez and Sirmans, 1996; and Manning and Roulac, 2001.

Inductive Research Approaches using Primary Data

Grounded Theory (3): Manning, 1991; O'Mara, 1999; and Gibson and Barkham, 2001.

Delphi (1): Carn, Black and Rabianski, 1999.

Case Study (1): Duckworth, 1993.

Inductive Research Approaches using Secondary Data

Case Study (1): Miles, Pringle and Webb, 1989.

Inductive Research Approach using Little or No Data

Pedagogical (14): Albert and McIntosh, 1989; Dasso, Kinnard and Rabianski, 1989; Hoffman, Schniederjans and Sirmans, 1990; Manning, 1992; Noha, 1993; Nourse and Roulac, 1993; Manning and Roulac, 1996; Manning, Rodriguez and Roulac, 1997; Manning and Roulac, 1999; Roulac, 1999, 2001; Brown, 2001; Graff, 2001; and Rabianski, DeLisle and Carn, 2001.

Endnotes

- ¹ The increasing importance of globalization in management thinking is particularly important in regard to global locational advantages for different operational aspects of multinational companies. With the larger number and variety of locational considerations available to senior management that can think globally about achieving competitive advantages (*e.g.*, operating efficiencies, marketing opportunities, etc.), corporate real estate management will take on even greater strategic importance in the future. For example, it is not unusual for a firm to locate production in Mexico, sales in New York, warehousing in Denver and R & D operations in Germany. Along with economies of scale and scope, locational advantage considerations have strongly influenced the dramatic increase in multinational mega-mergers during the 1990s. [For a more in-depth discussion of locational advantage considerations see Porter (1998) and Yip (1992)].
- ² This research includes the work of Glascock, Davidson and Sirmans, 1989; Ambrose, 1990; Blackwell, Marr and Spivey, 1990; Rutherford, 1990; Slovin, Sushka and Polonchek, 1990; Alli, Ramirez and Yung, 1991; Christensen and Levi, 1991; Glascock, Davidson and Sirmans, 1991; Myer, He and Webb, 1992; Allen, Rutherford and Springer, 1993; Ball, Rutherford and Shaw, 1993; Christensen and Levi, 1993; Elayan, 1993; Alwayay, Rutherford and Smith, 1995; Chan, Gau and Wang, 1995; Ghosh, Rodriguez and Sirmans, 1995; Booth, Glascock and Sarkar, 1996; Perrino, 1997; Manning, Rodriguez and Ghosh, 1999; and Shilton and Stanley, 1999.
- ³ For example, centralized vs. decentralized, and internal vs. outsource support to business unit managers (Pittman and Parker, 1989; Rutherford and Stone, 1989; Kimbler and Rutherford, 1993; Noha, 1993; Manning and Roulac, 1996; Johnson, Redman and Tanner, 1997; and Manning, Roulac and Rodriguez, 1997).
- ⁴ Key value drivers are discussed at length by Copeland, Koller and Murrin (1994, 2000). The essence of the key value driver concept is that senior management's strategic goals of cash flow, productivity, ROI, etc. can be translated into key operating ratios and/or statistics at all levels throughout an organization. Value based management (which makes use of key value drivers) places timely information on these key ratios at the appropriate decision (and control) level within the organization that can bring about the improvement in a particular key value driver's performance. For example, while senior management seeks to improve cash flow on invested capital (ROIC), this goal can be partially achieved by key value drivers at lower organizational levels such as deliveries per

- customer or miles driven per delivery, such that improving these operational aspects will be key to achieving senior management's goal of improving ROIC.
- ⁵ Thirty-nine of the forty-two corporate real estate articles published before 1999 looked at issues predominantly in either Quadrant 3 or 4 and typically used one of two research methodologies—time series or survey research. The three articles that looked at business issues in Quadrants 1 and 2 in addition to real estate issues in Quadrants 3 and 4 are Hoffman, Schniederjans and Sirmans (1990), Nourse and Roulac (1993) and Nourse (1994).
 - ⁶ The nineteen articles that focused on issues predominantly in Quadrant 4 are Dasso, Kinnard and Rabianski (1989); Gale and Case (1989); Miles, Pringle and Webb (1989); Pitman and Parker (1989); Redman and Tanner (1989, 1991); Rutherford and Stone (1989); Veale (1989); Manning (1991, 1992); Duckworth (1993); Johnson and Keasler (1993); Kimbler and Rutherford (1993); Noha (1993); Simons (1993); Toeh (1993); Manning and Roulac (1996); Johnson, Redman and Tanner (1997); Manning, Roulac and Rodriguez (1997). Eight of these nineteen reported on information gathered by written questionnaires from corporate real estate executives about how they do their jobs. These articles reporting on survey research were Pittman and Parker (1989); Redman and Tanner (1989, 1991); Rutherford and Stone (1989); Veale (1989); Kimbler and Rutherford (1993); Toeh (1993); and Johnson, Redman and Tanner (1997);.
 - ⁷ The seventeen articles that used time series research methodology to investigate impact on shareholder wealth are Glascock, Davidson, and Sirmans (1989, 1991); Blackwell, Marr and Spivey (1990); Rutherford (1990); Slovin, Sushka, and Polonchek (1990); Alli, Ramirez and Yung (1991); Christensen and Levi (1991, 1993); Myer, He, and Webb (1992); Allen, Rutherford and Springer (1993); Elayan (1993); Ball, Rutherford and Shaw (1993); Alwayay, Rutherford and Smith (1995); Chan, Gau and Wang (1995); Ghosh, Rodriguez and Sirmans (1995); Booth, Glascock and Sarkar (1996); and Perrino (1997). The three articles that looked at Quadrant 3 issues that did not investigate shareholder wealth impact using time series methodology are Albert and McIntosh (1989), Ambrose (1990) and Rodriguez and Sirmans (1996).
 - ⁸ The nine articles are by Carn, Black and Rabianski (1999); O'Mara (1999); Brown (2001); Gibson and Barkham (2001); Gibson and Lizieri (2001); Rabianski, DeLisle and Carn (2001); Manning, Rodriguez and Ghosh (1999); and Roulac (1999, 2001), with Manning, Rodriguez and Gosh (1999); O'Mara (1999); Roulac (1999, 2001), Brown (2001); Gibson and Barkham (2001); Gibson and Lizieri (2001) looking at Quadrant 1 and Quadrant 2 issues.
 - ⁹ Seventeen articles looked at the impact on a company's stock price as a result of some real property related action such as leasing (Allen, Rutherford and Springer, 1993), sale and leaseback (Alwayay, Rutherford and Smith, 1995; Rutherford, 1990; and Slovin, Sushka and Polonchek, 1990), corporate headquarters relocation (Alli, Ramirez and Yung, 1991; Chan, Gau and Wang, 1995; and Ghosh, Rodriguez and Sirmans, 1995), acquisition or disposition (Glascock, Davidson, and Sirmans, 1989, 1991; Myer, He and Webb, 1992; and Booth, Glascock and Sarkar, 1996;), corporate restructuring (Christensen and Levi, 1991, 1993; Ball, Rutherford and Shaw, 1993; and Perrino, 1997), joint ventures (Elayan, 1993) and plant closings (Blackwell, Marr and Spivey, 1990).
 - ¹⁰ Inductive reasoning starts with related known facts or theories and moves toward creatively generalizing about how these facts or theories may be related in a new insightful general theory. Deductive reasoning proceeds from the opposite direction by beginning with more general accepted theory, and concluding something to be true about

facts or other theories that are believed to be governed by the relevant more general theory. One of the most famous examples of inductive reasoning was Copernicus' insight that the retrograde motion of planets in our solar system (*i.e.*, the seeming backward movement in the sky of planets in relation to the stars) could be explained if it were true that the Earth, not only rotated on its axis each day, but that it also revolved around the Sun each year. Copernicus began his inductive reasoning with the facts of many visual observations of planets seeming to move backward at times combined with theories accepted at the time about gravity, astronomy, and religion in order to come up with a creative new idea to explain something that before was unexplainable. Most of the scientific discoveries that have transformed Western civilization since the Renaissance into the age of reason are the result of at least some inductive reasoning before these discoveries happened.

In contrast, the application of mathematical axioms and theorems to arrive at an answer or solution are examples of deductive reasoning (*e.g.*, $2 + 2 = 4$). Here, the relationship of specific data ($2 + 2 = ?$) is deduced according to accepted mathematical theory (addition). Thus, it can be said that where inductive reasoning extrapolates toward formulation of a generalized truth, which may be inferred from consideration of a number of particular occurrences or cases, deductive reasoning deduces, or concludes, starting from a point of more generally accepted theory, moving toward what should be true about a particular case or occurrence, due to the hypothesized applicability of the generally accepted theory.

- ¹¹ As illustrated in Exhibit 4, inductive research approaches more often than not need to rely on primary data for generating new theories. For example, of the twenty corporate real estate articles that used an inductive research approach, only one relied on secondary data.
- ¹² Diaz (1993:191) also suggests a similarity between the overall real estate discipline and marketing when he says: "... academic real estate may never become a highly focused discipline." Still, he does not consider this to be a problem as he goes on to state: "With its broad territory, real estate is unlikely to find a single, central focus capable of embracing its wide range of issues and problems. Other disciplines faced with such diversity of territory have adopted multiple foci and have developed into a set of strong sub disciplines."
- ¹³ It should be noted that while Kottler uses the word positive to refer to what is being done, and the word normative in reference to what should be done, Diaz (1993) uses the words descriptive vs. prescriptive, respectively, while others have used still different terms when making this same distinction.
- ¹⁴ For example, Roulac (1999) draws on the value chain management literature, Brown (2001) draws on the architecture literature, Gibson and Lizieri (2001) draw on the corporate restructuring management literature and Manning, Rodriguez and Roulac (1997) adapt the theory of the firm management literature (Weston, Chung and Hoag, 1990:26–53) to gain insights on how to think about the outsourcing of corporate real property services. This is in addition to O'Mara's (1997, 1999) use of grounded theory research methodology common in sociology.
- ¹⁵ O'Mara (1997) accomplished her earlier grounded theory research through ninety-six one-to-two hour interviews with corporate real estate managers, supplemented with observations and review of company documents, in order to develop inductive insights on how different patterns of organizational behavior result in different real estate strategies and physical setting outcomes at companies facing market uncertainty. Rather

than starting with preconceived notions of what variables are most important, grounded theory research methodology attempts to remain open to the phenomenon under observation, synthesize themes from several observations and report as objectively as possible. Grounded theory emphasizes the use of inductive reasoning grounded in the constant comparison of real life (empirical) observations. The grounded theory approach clarifies the relevant questions to be asked and offers insight into possible future trends. The goal of this type of research is theory generation, not theory testing (see also Glaser and Strauss, 1967; and Eisenhart, 1989).

¹⁶ For example, Duckworth, 1993; Joroff, Louargand, Lambert and Becker, 1993; Becker and Joroff, 1995; Becker, Joroff and Quinn, 1995; Lambert, Poteete and Waltch, 1995; Bell, 1997; and Materna and Parker, 1997, 1998.

¹⁷ A list of prior IDRC publications up to 1998, to include the other IDRC publications going back to 1968 as well as IDRC CRE 2000 reports and bulletins, can be found as an Appendix in Manning and Roulac (1999). In addition, IDRC publishes *Site Selection* that has included many corporate real estate professional articles.

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