



## Trends in Real Estate Research, 1988–2001: What's Hot and What's Not

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### **Abstract**

This paper examines publications and citations for topic and technique trends in *JREFE* and *REE* during the period 1988–2001. Publication and citation patterns reveal real estate as a largely empirical field. The mix of topics and techniques published by the two journals as well as sources cited and garnering citations are converging over time. Within topic or technique categories, the most frequently cited papers or authors tend to garner citations that vary with the relative popularity of the category in the broader literature. Yet, the impacts of top contributors reflect significant contributions outside their most cited research in one specialized one topic area or technique.

**Key Words:** citation analysis, research rankings, author rankings, research topics, research techniques

### **1. Introduction**

By all appearances, real estate has gone through a period of rapid expansion and change over the past 15 years as an academic field. This period saw the creation of a new major professional association (American Real Estate Society), new major journals (*Journal of Real Estate Research* in 1986 and the *Journal of Real Estate Finance and Economics* in 1988), and even a change in the name of a leading journal (*The AREUEA Journal* to *Real Estate Economics*). These highly visible developments bring to mind questions about how the more substantive aspects of the field are changing over time. In particular, has the focus of academic research in real estate changed over time? And has real estate become more distinct from finance and economics, or has it become more firmly integrated with its sister fields?

This paper examines the trends in topics and techniques in academic real estate research revealed by the *Journal of Real Estate Finance and Economics* (*JREFE*) and *Real Estate Economics* (*REE*) during the period from 1988 to 2001. It also uses citation counts to measure the extent to which real estate research draws upon nonreal estate journals in finance and economics as well as to identify the most cited published research in real estate itself. The 14-year sample period is long enough to identify trends (in any case, *JREFE* began publication in 1988, which precludes extending our study to earlier years). The focus is on identifying changes in emphasis in terms of both publication patterns and

citation patterns revealed by the research published in these two journals; the goal is to analyze trends in broad topics, the mode of analysis (theoretical, empirical, or simulation), the exporting–importing behavior of researchers in real estate, as well as identifying the most highly cited papers and individuals in these two journals over the sample period.

The results not only paint a picture of how real estate is evolving as a field, they also provide insight into the research production process in real estate and how it relates to that of other fields. There are two ways to measure research trends; the number of papers or published pages distributed across topics; or examine the citation patterns in the most widely recognized journals publishing academic research to identify popular sources and influential papers within and across real estate topics. Each approach answers different questions. Previous studies of research in real estate and related areas use both approaches. Sa-Aadu and Shilling (1988), Chung and Kolbe (1991), Allen and Kau (1991), and Dombrow and Turnbull (2000, 2002), Ong et al. (2001) use publication or page counts to identify the largest contributing individuals and institutions in important real estate journals. Claurette and Daneshvary (1993) use the publishing patterns of individuals in real estate and finance to examine the research ties between finance and real estate journals. They also use citations in these journals to rank contributing authors. Ong et al. (2001) use both publication counts and citation counts to examine the multinational pattern of publishing by real estate scholars in the United States, Europe, and Asia.

Little work has been done identifying research trends within academic disciplines. Stratham (1992) studies the trend in analytical techniques for papers published in the *Journal of Regional Science* while Rey and Anselin (2000) examine the mix of topics in regional science journals using keyword analysis; there is no comparable study of topic mix or trends for real estate. Ong et al. (2001) examine the mix of techniques used by papers published in American and U.K. real estate journals for the six-year period 1993–1998. Our study includes a detailed examination of the overall mix as well as trends in both topics and techniques over an extended 14-year period, 1988–2001.

Before turning to the results, it is worthwhile to consider the choice of *REE* and *JREFE* for the analysis. Both are included in the Social Science Citation Index (SSCI), making it feasible to trace how other journals in finance and economics cite papers published in these two journals. In addition, previous studies also identify these journals as important outlets for academic research specializing in real estate with less focus on professional topics than other widely read journals (Diaz et al., 1996; Gibler and Ziobrowski, 2002). Since our goal is to examine the trends in academic research, *JREFE* and *REE* are obvious journals to include. Finally, since the purpose is to see the extent to which real estate has developed into a discipline distinct from related areas in finance and economics, we must exclude from the analysis other journals that publish notable amounts of real estate research, like the *Journal of Urban Economics*, *Land Economics*, *Journal of Housing Economics*, and related outlets, because they also include significant amounts of research in broader economic topics, including housing, urban and transportation issues, and regional economics. Finally, we exclude the *Journal of Real Estate Research (JREER)* from the analysis largely because it is not included in the SSCI data base. Regardless of its role in the academic community, this fact precludes a comparable analysis of *JREER* at this time.<sup>1</sup>

## 2. Trends in topics

We begin by examining the mix of papers published in *JREFE* and *REE* according to topic areas. Table 1 defines the different topic categories used in this study. It is useful at this point to note that, as indicated in the table, the short topic headings are not intended to be fully descriptive; each includes a range of topics. There are nine broad categories delineated. Although there is a wide range of topics within each category, the category boundaries are designed to identify areas in the literature that share more in common within the boundaries than across boundaries. Of course, any definition of topic classifications is arbitrary to some extent and the assignment of papers to a single topic category may also be subjective for some papers. Our goal, however, was to set up categories that are broad enough to cover wide but related swathes of literature. Rather than rely upon the keywords or other formula, one coauthor of this study examined each article to evaluate the topic and technique category; the other then reviewed the results to identify possible inconsistencies or oversights, which were then reevaluated by the initial individual classifying each paper. Although painstaking, this procedure relies primarily on the judgement of a single individual in order to maximize consistency in assigning categories for each of the papers published in the two journals over the 14-year sample period.

Table 2 reports the mix of topics over the 14-year sample period, 1988–2001. Both journals are similar to the extent that investments and mortgages represent the two largest topics whether measured by percentage of articles or pages published. The appraisal topic area represents a distant third for both journals. Brokerage, institutions, and nonresidential real estate are not very popular topics during the sample period, each comprising 5 percent or less of published pages. The differences between journals appear to be limited to a greater number of papers on public policy in *JREFE* and greater number on nonresidential in *REE*. The allocation of pages in *JREFE* and *REE* shifts emphasis slightly to the appraisal and mortgage topic classifications, respectively. This difference in trends

Table 1. Topic categories and descriptions.

Appraisal	Hedonic price and rent analysis, valuing property and neighborhood attributes, constructing property price indices.
Brokerage	Real estate brokerage service market, positive and normative analysis of commission contracts, multiple listing services.
Housing	Housing markets, land markets, search and matching, rental markets, vacancy, subdivision development.
Institutions	Property rights, normative and positive analysis of contracts and leases, liability laws.
Investments	Real estate asset returns, portfolio analysis, REITs, secondary mortgage markets.
Mortgages	Pricing, prepayment and default, contract structure.
Nonresidential	Manufacturing, office, retail, and shopping center properties.
Public policy	Land use regulation, zoning, taxation, development fees, public housing policy, flood insurance, externalities.
Other	Remaining topics that do not fit into any of the above categories.

Table 2. Breakdown of topics across time.

Topic	Both Journals						JREFE			REE		
	Percent of Articles		Percent of Pages		Percent of Pages		Percent of Pages		Percent of Pages		Percent of Pages	
	Full Period	1988-1992	1993-1997	1998-2001	Full Period	1988-1992	1993-1997	1998-2001	Full Period	1988-1992	1993-1997	1998-2001
Appraisal	18.22	18.77	15.09	21.46	20.41	17.12	19.14	24.24	16.48	22.28	10.19	17.60
Brokerage	4.91	5.05	3.77	6.13	3.71	3.95	2.23	5.15	5.41	5.71	4.00	6.56
Housing	12.62	15.16	11.95	10.73	11.55	10.33	12.71	11.20	13.37	19.83	11.43	9.50
Institutions	3.15	2.17	4.72	2.30	3.38	3.11	6.21	0.47	2.29	0.99	0.42	5.34
Investments	21.61	18.05	22.01	24.90	22.39	15.86	24.20	25.27	24.21	21.73	23.43	27.24
Mortgages	24.53	23.10	29.25	20.31	22.98	30.82	20.22	20.16	27.30	14.59	42.73	23.15
Nonresidential	5.49	7.94	4.40	4.21	3.49	1.69	4.67	3.54	6.60	12.37	2.58	5.45
Other	3.15	1.81	3.14	4.60	2.71	0.74	3.38	3.46	2.15	1.82	2.23	2.37
Public policy	6.31	7.94	5.66	5.36	9.39	16.39	7.25	6.52	2.20	0.67	2.97	2.80

measured in terms of pages versus number of papers largely reflects longer papers on average in appraisal and mortgage topics for each journal.

In order to identify underlying trends over the sample period, Table 2 breaks down the topic mix across journals for the three subperiods 1988–1992, 1993–1997, and 1998–2001. While the appraisal topic has steadily risen in importance in *JREFE*, it has generally declined and exhibited much greater variation in *REE*. Published research in mortgages dropped significantly from 31 to 20 percent of pages in *JREFE* between the first and second subperiods contrasting with the dramatic jumps from 15 to 42 percent and back down to 23 percent for the subperiods in *REE*. Part of the instability in mix over time observed in *REE* relative to *JREFE* is likely a reflection of the periodic changes in editors in the former journal compared with the continuity experienced by the latter.

Other trends are more consistent across both journals. In particular, investments gained importance while the popularity of housing, nonresidential, and public policy topics waned during the sample period.

### 3. Trends in techniques

We now consider the mix of papers published using various techniques. The technique categories used in this study are the five broad classifications: empirical, method, literature review, simulation, and theory. Papers were classified according to technique using the same general procedure used above for assigning topic categories, with the overriding goal of consistency when assigning papers to the different categories. Nonetheless, some explanation of the underlying rationale is appropriate at this point. A quick look at any given issue of *REE* or *JREFE* will illustrate that many papers presenting formal theoretical modeling include empirical analysis based on the model. We classify these papers as theoretical only when the empirical part of the study could be ignored without losing much contribution, or when the authors identify the empirical part of the paper as an example or a specific application illustrating the more general theoretical result. On the other hand, most papers presenting both theoretical and empirical analysis use the theory to derive one or several empirical relationships between observable variables that are subsequently estimated using data. These papers are categorized as empirical. In sum, an effort was made to identify the single most important contribution of each paper—theoretical or empirical—and to categorize each paper accordingly.

In contrast, distinguishing theory from simulation is relatively straightforward. Papers that present theoretical models and then analyze the question at hand using the comparative statics methodology without quantifying or measuring the size of comparative static effects using explicit functional forms or data fall into the theoretical analysis category.<sup>2</sup> Papers relying on algebraic examples to resolve ambiguous comparative static predictions are classified as simulation studies.

The empirical classification includes any study using real (as opposed to simulated) data and typically frequentist (classical) or Bayesian econometric methods to evaluate hypotheses. Papers that estimate key parameters in order to calibrate models for simulations are classified as simulation studies. Methodological studies are those whose

sole purpose is to develop and/or explain a novel technique for consideration by research scholars. If econometric estimation is included in the paper, the application must be stated as subsidiary to the method by the author. Many of the papers importing established econometric techniques from finance or economics justify the technique as a better way of estimating a particular effect or result. They are classified as empirical studies rather than methodological research when they contain no systematic comparison of the new application and the more widely accepted technique. Given the applied nature of real estate research, it is not surprising that we identified relatively few papers in the method category. Nonetheless, we believe that the distinction between empirical and method categories is wide enough to be meaningful for our purposes.

We acknowledge that our classifications likely differ from those that would be suggested by others. For example, Strathman (1992) categorizes regional science research as theory, method, or empirical. Ong et al. (2001) on the other hand categorize real estate papers as theory, empirical methods, case study, or descriptive. This illustrates the reason why we introduce our own classification system rather than relying upon each author's own description of his or her work as empirical, theory, or whatever: opinions differ across individuals; therefore, use of authors' own keywords or abstracts would lead to an inconsistent classification system.

Table 3 reports the mix of papers in the different technique categories by journal and the three subperiods. Not surprisingly, empirical analysis represents the largest single technique category for either journal. Over 63 percent of *JREFE* articles and about 72 percent of *REE* articles fall into this category, representing approximately 67 and 74 percent of published pages in each journal, respectively.

Methodology papers and literature reviews comprise slightly greater percentages of pages in *JREFE* than *REE* over the sample period, but the numbers are so small that the differences are not appreciable. The major differences between the two journals appear to be in the mix of empirical and theoretical research; *JREFE* exhibits a relatively heavier mix (over 16 percent of pages) of theory than does *REE* (about 10 percent of pages).

Looking at other differences across techniques, both journals reveal that the average number of authors per empirical paper is just over two for either journal while the average number of authors per theoretical paper is about one and two thirds. Put somewhat differently, theory papers are more likely to be the product of a single author than empirical papers. Literature reviews are even more likely to be single authored than are theory papers, while simulation papers appear closer to the average for empirical papers. This is not surprising given the way we defined the technique categories. Research bringing together a wide range of skills, from theoretical modeling to econometric technique, will most likely be included in the empirical category in this study.

Table 3 also reports trends in techniques across the three subperiods based on percentage of pages published. The comparisons based on the percentage of papers published are similar to those reported here. *JREFE* exhibits a large increase in empirical research published, from about 49–79 percent. At the same time, it shows a relative decline in theory over the 14-year period, from almost 23 percent to just over 11 percent of pages published. The pattern for empirical research published in *REE* is less pronounced but also shows a significant increase over time. The percentage of pages dedicated to empirical

Table 3. Breakdown of technique across time.

Technique	Both Journals			JREFE			REE					
	Percent of Articles			Percent of Pages			Percent of Pages					
	Full Period	1988–1992	1993–1997	1998–2001	Full Period	1988–1992	1993–1997	1998–2001	Full Period	1988–1992	1993–1997	1998–2001
Empirical	67.17	59.21	66.35	76.63	66.78	49.32	67.47	79.06	73.69	68.79	72.39	79.43
Method	1.75	2.53	1.26	1.53	2.34	4.00	2.51	0.09	1.46	2.22	0.00	2.26
Review	6.89	10.47	5.66	4.60	5.66	10.75	3.88	3.81	3.37	7.69	2.83	0.00
Simulation	8.64	10.83	8.81	6.13	8.47	13.07	8.44	5.07	11.32	11.34	12.57	10.04
Theory	15.54	16.97	17.92	11.11	16.75	22.87	17.70	11.16	10.16	9.95	12.21	8.28

studies rises from about 69–79 percent, resembling to some extent the trend shown by the other journal. On the other hand, the percentage of pages dedicated to theory rises and falls, with no strong discernable trend over the entire sample period.

Overall, empirical research has grown while theoretical contributions have become relatively less important in real estate journals, the latter result primarily from the fact that the page mix in *JREFE* converges to the *REE* page mix over the period. The relative importance of empirical and theoretical research measured by citations is considered in later sections.

Table 4 breaks down the mix of techniques for the nine topic categories used in the previous section. Each entry in the table represents the percentage of the number of pages of published papers in that topic category using the specified technique. For example, the largest single category is the empirical investment literature, representing just over 19 percent of the total published literature in *JREFE* and almost 23 percent in *REE*. Empirical appraisal and mortgage topics also represent large categories relative to the others summarized in the table.

The information in Table 4 reinforces the contrast between the empirical and theoretical literatures in real estate. The four topics to which theoretical analysis is most often applied are mortgages, housing, policy analysis, and brokerage issues. Finally, the results also illustrate that simulation is applied overwhelmingly in the mortgages topic area, in large part reflecting the popularity of option pricing models in this topic.

Table 4. Topics and techniques.

	Empirical	Method	Review	Simulation	Theory
<i>JREFE</i>					
Appraisal	17.17	1.55	0.08	0.15	1.45
Brokerage	1.62	0	0.03	0.53	1.54
Housing	7.96	0.14	0.25	0.37	2.84
Institutions	0.75	0	0.80	0.43	1.40
Investments	19.29	0	0.25	1.20	1.65
Mortgages	13.45	0.37	1.43	4.51	3.22
Nonresidential	2.12	0	0.19	0.18	1.00
Other	0.94	0.28	0.76	0	0.73
Public policy	3.50	0	1.87	1.09	2.93
<i>REE</i>					
Appraisal	13.76	1.33	0.45	0.85	0.09
Brokerage	1.90	0	0.39	1.02	2.09
Housing	9.60	0	0.12	1.11	2.54
Institutions	1.33	0	0	0.42	0.54
Investments	22.56	0	0.39	0.79	0.47
Mortgages	18.07	0	1.03	6.16	2.04
Nonresidential	4.51	0.14	0.52	0.98	0.45
Other	1.12	0	0.39	0	0.64
Public policy	0.84	0	0.06	0	1.30



#### 4. The role of special issues

Special issues play an important role in publishing real estate research. *JREFE* and *REE* both publish special issues, although *JREFE* relies more heavily on special issues than does *REE* for the period under study. Academic research does not flow as easily between Asia, Europe, and the Americas as it does within North America. Real estate is no different than other academic disciplines in this respect (Ong et al., 2001). Earlier research illustrates that special issues are effective in bringing the work of authors at European and Asian institutions into U.S. mainstream outlets (Dombrow and Turnbull, 2000). Another rationale for special issues is they widen the scope of real estate in important ways, by searching out and bringing topics and techniques into mainstream real estate journals that otherwise might not be accepted by the standard pool of referees without expertise in these other areas. Perhaps as compelling is the notion that there are rational authors who, when deciding where to submit their research for publication, overlook real estate journals because they are aware that the journals have no history of publishing papers like theirs. In such cases, editors can use special issues to credibly signal that the designated topics now lie within the purview of the journal, regardless of previous practice.

So, does the observed mix of topics and techniques in special issues differ from regular issues? Table 5 presents a summary of special issues compared with regular issues, broken down by percentage of pages published by topic and technique. The breakdown for the two types of journals is roughly 70 percent of pages in regular issues and 30 percent in special issues. Relative to this mix, literature reviews appear to be overrepresented in special

Table 5. Percentage of pages for special issues.

	<i>JREFE</i>		<i>REE</i>	
	Regular Issue	Special Issue	Regular Issue	Special Issue
Technique				
Empirical	68.83	63.00	74.89	69.87
Method	3.41	0.36	1.02	2.88
Review	1.70	12.98	1.92	7.97
Simulation	8.57	8.28	11.09	12.03
Theory	17.49	15.38	11.08	7.25
Topic				
Appraisal	22.67	16.21	16.49	16.45
Brokerage	4.47	2.29	7.11	0
Housing	9.55	15.27	12.55	15.99
Institutions	2.32	5.33	3.00	0
Investments	27.47	12.98	29.15	8.48
Mortgages	20.63	27.34	22.74	41.80
Nonresidential	4.73	1.18	4.39	13.62
Other	3.05	2.09	1.76	3.39
Public policy	5.11	17.32	2.81	0.26

issues. A little reflection, however, reveals why this might be so: special issues typically have short overview articles of the content provided by the special issue editor. As these are classified as literature reviews in our system, we should expect to find this technique over-represented in special issues. Interestingly, though, methodology papers are also over-represented in regular issues. Other than these two differences, regular and special issues appear to have much the same mix of published research by technique.

With respect to topics, however, we do see some interesting differences between regular and special issues. Indeed, this is as expected if special issues are performing the functions hypothesized above. Housing, mortgages, nonresidential, and public policy are all overrepresented in special issues. Special issues bring more research to one of the most popular areas (mortgages) but also increase the presence of several less popular areas (nonresidential real estate and public policy). Thus, special issues do expand the range of topics published in real estate research, but special issues also reinforce select popular topics as well.

## 5. Sources and uses of real estate research

Our analysis of the sources and uses of real estate research is based on citation counts. We used SSCI data as the foundation of our data set, manually adding the citations from articles in *JRER* to the relevant *JREFE* and *REE* articles in our sample period. Our examination of the *JRER* citations shows that the articles published in *JRER* are significant users of research published in both *JREFE* and *REE*, so that relying solely on SSCI data and omitting the citations from *JRER* would seriously bias any citation-based measures of the relative contributions of articles published in *JREFE* and *REE*.

Table 6 lists the journals that are most frequently cited by papers published in *JREFE* and *REE*. The first column reports the most cited journals for both *JREFE* and *REE* combined. (While not reported in the table, we note here that the citations by each of the two sources individually for the entire sample period do not significantly deviate from this list.) Several results are evident. First, as expected, the journals that are widely recognized in the academic real estate community as important outlets for real estate research are important sources for researchers publishing in the two core real estate journals examined here: *REE* and *JREFE*, of course, but also the *Journal of Urban Economics*, *Land Economics*, *Journal of Housing Economics*, and *Regional Science and Urban Economics*.<sup>3</sup> Over the entire sample period, papers published in *JREFE* generated 9,168 citations while papers published in *REE* generated 8,222 citations. Within the top 20 cited journals, finance journals (*Journal of Finance*, *Journal of Financial Economics*, *Journal of Financial and Quantitative Analysis*, and *Journal of Portfolio Management*) account for 866 citations by papers in *JREFE* and 977 by papers in *REE*. In contrast, general economics journals (*American Economic Review*, *Journal of Political Economy*, *Quarterly Journal of Economics*, and *Review of Economics and Statistics*) only account for 675 and 601 citations in the two real estate journals, respectively. On balance, published real estate research in the two core journals appears to draw more heavily from finance than from general economics journals. The relationship between real estate and finance journals is

Table 6. Journals being cited by time period by both journals.

Full Period	1988–1992	1993–1997	1998–2001
Real Estate Economics	1,937	547	734
Journal Finance	957	267	347
Journal Real Estate Finance	823	245	286
Journal Urban Economics	792	164	278
Journal Financial Economics	554	164	192
American Economic Review	529	108	187
Econometrica	438	92	174
Journal Real Estate Research	379	79	144
Journal Political Economy	359	75	142
Review of Economics & Statistics	255	74	93
Land Economics	240	61	92
Housing Finance Review	189	58	87
Journal Money Credit & Banking	184	52	80
Journal American Statistical Association	178	47	76
Journal Portfolio Management	167	42	73
Journal Financial & Quant. Analysis	165	42	66
Journal Business	164	40	55
Regional Science & Urban Economics	152	34	49
Quarterly Journal of Economics	133	31	42
Journal Econometrics	126		42
			656
			476
			343
			269
			198
			188
			178
			156
			125
			87
			83
			74
			74
			72
			69
			62
			61
			57
			55
			54

closer than that between real estate and economics journals. This closeness is not superficial. It is, to some extent, a reflection of the ties acknowledged by the popular practice of housing real estate faculty within finance departments.

Table 6 also breaks down the citations to other journals into the three sub-periods 1988–1992, 1993–1997, and 1998–2001. *REE* is the top cited source throughout the sample period. However, the steady rise of *JREFE* over time as a source for real estate scholars is also evident in the table. Although not reported here, the breakdown by individual years shows *JREFE* breaking into the top 20 cited journals in 1991, only three years after its inaugural issue. It rises to the fourth to fifth rank during 1992–1996, third rank in 1997, then ranked second from 1998–2001, the end of our sample period. Interestingly, in 2001 the number of citations to papers in *JREFE* is 132, approaching the 159 citations to *REE* papers for the year. The convergence in these two journals in terms of both from where sources are cited and as sources themselves provides support for the widely held view of these journals as the top specialized outlets for academic real estate research.

Redman et al. (1998) identify the top journals cited by the articles published in *JRER*, *Appraisal Journal*, *JREFE*, and *REE* over 1990–1995. Their list includes *REE*, *Journal of Finance*, *Journal of Urban Economics*, *Journal of Financial Economics*, *American Economic Review*, *Journal of Political Economy*, *Land Economics*, *Econometrica*, *JREFE*, *Appraisal Journal*, *JRER*, *Review of Economics and Statistics*, and *Journal of Portfolio Management*, which overlaps with our list in Table 6. This similarity suggests that the citation pattern for papers published in *JRER* and the *Appraisal Journal* resemble those found in *JREFE* and *REE*.

Table 7 ranks the 20 papers most cited by research published in the two real estate journals for the sample period. Not surprisingly, the majority of the most heavily cited individual papers were published during the 1980s to early 1990s period. Important papers are drawn from both economics and finance sources, but a large component appears in *JREFE* and *REE* themselves. This shows a degree of self-containment within real estate; continuing advances in the field draw as heavily from real estate as they do from finance and economics combined.<sup>4</sup>

Having examined the background sources for the papers published in these real estate journals, we now turn to the question of which journals draw from the research published in *JREFE* and *REE*. Table 8 lists the top 20 journals citing research published in *JREFE* and *REE*. Over the entire 14-year sample period, papers in *JREFE* have been cited 1,864 times while those in *REE* have been cited 2,599 times. Not surprisingly, papers in *JREFE* and *REE* are cited most heavily by other papers in these two journals, being third and first in the rankings. Papers in *JRER* are the second most important source of citations of the research published in *JREFE* and *REE*. Other widely recognized outlets for real estate research also draw from the work in the two core journals (*Journal of Urban Economics*, *Journal of Housing Economics*, etc.). In addition, *Journal of Financial Services Research*, *Environment and Planning A*, *New England Economic Review*, *Journal of Banking and Finance*, *Review of Economics and Statistics*, *Applied Economics*, *Journal of Money, Credit, and Banking*, *Review of Financial Studies*, and *Applied Economics Letters* are also among the top 20 users of *JREFE* and *REE* papers, although the total number of citations arising from this group is overshadowed by those from the more traditional real estate

Table 7. Top 20 papers cited by *JREFE* and *REE*.

Reference	Citations
Case, K. E., and R. J. Shiller, 1989, <i>American Economic Review</i> , v79, p125	63
Rosen, S., 1974, <i>Journal of Political Economy</i> , v82, p34	43
Bailey, M. J., R. F. Muth, and H. O. Nourse, 1963, <i>Journal of the American Statistical Association</i> , v58, p933	40
White, H., 1980, <i>Econometrica</i> , v48, p817	38
Cox, J. C., J. E. Ingersoll, and S. A. Ross, 1985, <i>Econometrica</i> , v53, p385	37
Ibbotson, R. G., and L. B. Siegel, 1984, <i>Real Estate Economics</i> , v12, p219	37
Dunn, K. B., and J. J. McConnell, 1981, <i>Journal of Finance</i> , v36, p599	36
Gyourko, J., and D. B. Keim, 1992, <i>Real Estate Economics</i> , v20, p457	36
Hartzell, D., J. Hekman, and M. Miles, 1986, <i>Real Estate Economics</i> , v14, p230	35
Ross, S. A., and R. C. Zisler, 1991, <i>Journal of Real Estate Finance and Economics</i> , v4, p175	34
Brennan, M. J., and E. S. Schwartz, 1985, <i>Real Estate Economics</i> , v13, p209	33
Geltner, D., 1989, <i>Real Estate Economics</i> , v17, p463	33
Case, K. E., and R. J. Shiller, 1987, <i>New England Economic Review</i> , v23, p45	32
Geltner, D. M., 1991, <i>Journal of Real Estate Finance and Economics</i> , v4, p327	32
Green, J., and J. B. Shoven, 1986, <i>Journal of Money, Credit &amp; Banking</i> , v18, p41	31
Chan, K. C., P. H. Hendershott, and A. B. Sanders, 1990, <i>Real Estate Economics</i> , v18, p431	30
Foster, C., and R. Van Order, 1984, <i>Housing Finance Review</i> , v3, p351	30
Kau, J. B., D. C. Keenan, W. J. Muller, and J. F. Epperson, 1992, <i>Journal of Money, Credit and Banking</i> , v24, p279	29
Brueggeman, W. B., A. H. Chen, and T. G. Thibodeau, 1984, <i>Real Estate Economics</i> , v12, p333	27
Schwartz, E. S., and W. N. Torous, 1989, <i>Journal of Finance</i> , v44, p375	27

outlets. To summarize, not surprisingly the three core real estate journals are the main users of research in *JREFE* and *REE*, urban and regional economics journals are the second largest group of users of this research, and finance and general economics are not heavy users of published real estate research.

The table also reports the journals that are the largest users of research published in *JREFE* and *REE* separately. Although there are some differences in the top 20 users of research in the two journals, most overlap. This is more evidence of the extent to which the characteristics of *JREFE* and *REE* are converging.

## 6. Citations of individual papers and authors

This section also examines the sources and uses of research published in *JREFE* and *REE*, but with a focus now on measuring the contributions of individual papers and authors, for both real estate as a whole as well as individual topic classifications.

Before turning to the results, it is important to remember what citations do and do not measure. First, as stated earlier, some tools or methods have become so much a part of the real estate research toolkit that they are used by individuals without formal citation;

Table 8. Top 20 journals citing papers from *JREFE* and *REE*.

Journals Citing Either	Journals Citing <i>JREFE</i>	Journals Citing <i>REE</i>
REE	1,064	452
Journal Real Estate Research	984	Journal Real Estate Research
JREFE	932	REE
Journal Urban Economics	238	Journal Urban Economics
Journal Housing Economics	197	Journal Housing Economics
Urban Studies	155	Urban Studies
Regional Science & Urban Economics	89	Regional Science & Urban Economics
Journal of Financial Services Research	41	Journal of Financial Services Research
Housing Policy Debate	37	Land Economics
Environment and Planning A	32	Review of Economics & Statistics
Land Economics	29	Environment & Planning A
Review of Economics & Statistics	26	Housing Policy Debate
New England Econ Rev	25	Housing Studies
Housing Studies	21	Journal Economic Perspectives
Applied Economics	20	Journal Regional Science
Journal Banking & Finance	20	Journal Business & Economics Statistics
Journal Money Credit & Banking	20	Journal Money Credit & Banking
Journal Regional Science	17	New England Econ Rev
Review of Financial Studies	16	Review of Financial Studies
Applied Economics Letters	13	Urban Geography
		REE
		Journal Real Estate Research
		JREFE
		Journal Urban Economics
		Journal Housing Economics
		Urban Studies
		Regional Science & Urban Economics
		Housing Policy Debate
		Environment & Planning A
		New England Economic Review
		Applied Economics
		Journal Banking & Finance
		Journal of Financial Services Research
		Journal Money Credit & Banking
		Land Economics
		Review of Economic & Statistics
		Housing Studies
		Omega-International Journal Management Science
		Applied Economics Letters
		Geographical Analysis
		Journal Finance
		Journal Regional Science
		Review of Financial Studies

citation counts therefore underrepresent the contributions of these researchers to the field. Second, the common practice of guiding literature searches using bibliographies of previous papers on the topic can steer subsequent generations of citations to those who popularize innovations in widely read journals rather than the original innovators in more obscure and older outlets; citation counts reflect visibility in the profession, but not necessarily relative worth (Vincent and Ross, 2000). Further, high citation rates need not imply lasting impact; novel insights or results that draw much initial attention can nonetheless “quickly lose favor among researchers ... [leaving] ... little lasting influence” (Borokhovich et al., 2000, p. 1466).<sup>5</sup> Durden and Ellis (1993) discuss other advantages and disadvantages of relying upon citation counts.

With these caveats in mind, citation counts still provide rudimentary measures of publication quality or impact and for that reason is a popular tool in publication analysis (Beattie and Ryan, 1991; Strathman, 1992; Claurette and Dansehvary, 1993; Hopsapple et al., 1993; Redman et al., 1998; Ong et al., 2001).

One approach to evaluate the sources drawn upon by real estate researchers is to count the references used by papers published in these two journals. Table 9 reports the individual papers most cited by research published in each of the topic categories in *JREFE* and *REE*. Note that the most frequently cited paper in a particular topic category need not be in that topic itself; see below for the most frequently cited papers within each category from the two journals. Although all topics draw from journals outside of real estate, the specific citation patterns of researchers in different topics differ. No two topic areas share the same most frequently cited paper.

Table 9. Top cited papers used by papers in *JREFE* and *REE* by topic and technique.

	Citations	Individual Reference
Topic		
Appraisal	34	Case, K. E., and R. J. Shiller, 1989, <i>American Economic Review</i> , v79, p125
Brokerage	21	Yinger, J., 1981, <i>American Economic Review</i> , v71, p591
Housing	11	Haurin, D., 1988, <i>Real Estate Economics</i> , v16, p396
Institutions	4	Coase, R. H., 1960, <i>Journal of Law &amp; Economics</i> , v3, p1
Investments	33	Gyourko, J., and D. B. Keim, 1992, <i>Real Estate Economics</i> , v20, p457
Mortgages	31	Cox, J. C., J. E. Ingersoll, and S. A. Ross, 1985, <i>Econometrica</i> , v53, p385
Nonresidential	13	Voith, R., and T. Crone, 1988, <i>Real Estate Economics</i> , v16, p437
Public policy	4	Henderson, J. V., 1985, <i>Journal of Urban Economics</i> , v18, p302 Ohls, J. C., R. C. Weisberg, and M. J. White, 1974, <i>Journal of Urban Economics</i> , v1, p428
Technique		
Empirical	45	Case, K. E., and R. J. Shiller, 1989, <i>American Economic Review</i> , v79, p125
Method	4	Case, K. E., and R. J. Shiller, 1989, <i>American Economic Review</i> , v79, p125 Colwell, P. F., R. E. Cannaday, and C. Wu, 1983, <i>Real Estate Economics</i> , v11, p11
Review	5	Dunn, K. B., and J. J. McConnell, 1981, <i>Journal of Finance</i> , v36, p599
Simulation	15	Cox, J. C., J. E. Ingersoll, and S. A. Ross, 1985, <i>Econometrica</i> , v53, p385
Theory	9	Yinger, J., 1981, <i>American Economic Review</i> , v71, p591

Finally, we consider the citation experience of papers published in the two real estate journals themselves. Figure 1(a) shows the synthetic life cycle of citations per year for papers published in *JREFE* and *REE*. Papers are generally not cited until after they have been in print for two years. The number of citations per year rises to a peak in the third to eighth year after publication, with a rapid decline thereafter. The figure reveals that papers in *REE* are more highly cited on average than papers in *JREFE*, a result confirmed by regression.<sup>6</sup> In an attempt to ascertain how much of this difference is attributable to the expected lower citation rates for papers in the early years of *JREFE* before it had established its presence in the real estate community as an important research outlet, Figure 1(b) presents the synthetic life cycle of citations per year ignoring the period from 1988 to 1992. Although the time period is rather limited, the graph reinforces the view that the citation performances of the two journals are converging in recent years.

The average citation life cycle is interesting, but how representative is it for the bulk of papers that appear in print? One might expect that, in real estate, like other disciplines, very few papers are cited heavily and most are cited hardly at all. Table 10 reports various

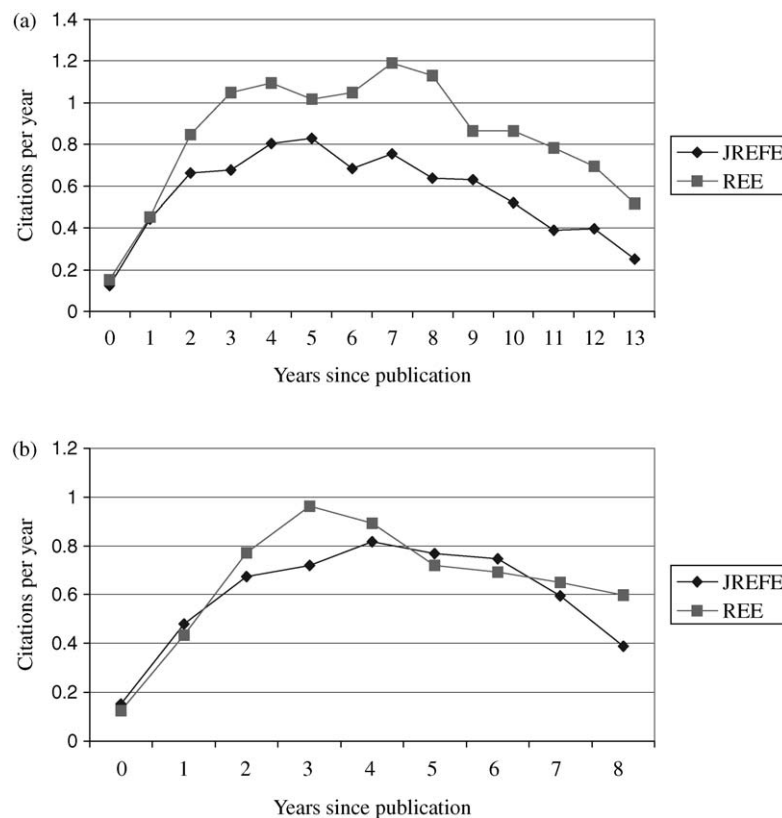


Figure 1. Synthetic life cycle for papers published in (a) 1988–2001, (b) 1993–2001.



Table 10. Summary statistics for number of citations to papers in *JREFE* and *REE* by year.

	Percentile									
	<i>JREFE</i>					<i>REE</i>				
	25th	50th	75th	99th	Mean	25th	50th	75th	99th	Mean
1988	2	3	6	24	5.4	2	7	14	44	10.8
1989	1	4	7	30	6.0	2	7	17	52	11.4
1990	1	4.5	10	18	6.2	4	9	16	61	13.3
1991	2	4	13	55	11.3	6	10	19	33	12.1
1992	1	3	6	37	6.5	3.5	9.5	13	62	11.1
1993	1.5	2.5	5.5	17	4.3	1	4	11	20	6.6
1994	1	3	8	32	5.6	2	4	6	16	4.6
1995	1	2	4	29	4.3	2	4	8	13	4.8
1996	0.5	1.5	4	15	2.6	1	2	4	8	2.9
1997	0	2	6	15	3.6	1	2	4	8	2.7
1998	0	2	4	9	2.5	1	2.5	5	11	3.2
1999	0	1	2	6	1.7	0	1	3	6	1.6
2000	0	0	1	5	0.7	0	0	1	5	0.7
2001	0	0	0	1	—	0	0	0	1	—

percentiles and the mean number of citations per paper. The difference between the average and median number of citations for papers reveals the expected skewed distribution of citations across papers.<sup>7</sup>

Table 11 identifies the 10 most heavily cited papers in *JREFE* and *REE* from any source during the sample period.<sup>8</sup> The total number of citations falls off rapidly with rank for papers in each of the journals. While comparing the most highly cited papers regardless of topic is interesting, it might be more appropriate to compare citation counts for papers dealing with similar topics in order to get a better measure of relative impact or importance (Peritz, 1992). The number of potential citations for a particular paper depends to a large extent on the number of subsequent papers written in the same topic category. Other things equal, we expect papers written in more popular topics (like investments or mortgages) to have more citations than an equally useful paper written in a less popular category (like brokerage or institutions). To control for this topic effect, Table 12 lists the top cited papers published in each of the topic categories in *JREFE* and *REE* based on the same method of measuring citations used in Table 11. Only two papers, Gyourko and Keim (1992) and Geltner (1991) in Table 12, are both the top cited papers in a topic and in a technique category. Gyourko and Keim's paper is both the most popular empirical paper in the core journals and the most popular paper in the investments topic. Geltner's paper is both the most highly cited methodology paper and the most popular paper written in the appraisal topic.

In order to measure the overall impact of individual authors on subsequent real estate research, Table 13 presents a ranking of individual authors based upon the total number of citations in *JREFE*, *REE*, and *JRER* regardless of where the cited paper was published.

Table 11. Top 10 cited papers from individual journals.

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*JREFE*

- Geltner, D., 1991, "Smoothing in Appraisal-Based Returns," v4, p327  
 Ross, S. A., and R. C. Zisler, 1991, "Risk and Return in Real Estate," v4, p175  
 Liu, C. H., and J. Mei, 1992, "The predictability of Returns on Equity REITs and Their Co-Movement with Other Assets," v5, p401  
 Quan, D. C. and J. M. Quigley, 1991, "Price formation and the Appraisal Function in Real Estate Markets," v4, p127  
 Fisher, J. D., D. M. Geltner, and R. B. Webb, 1994, "Value Indices of Commercial Real Estate: A Comparison of Index Construction Methods," v9, p137  
 Arnott, R., 1989, "Housing Vacancies, Thin Markets, and Idiosyncratic Tastes," v2, p5  
 Grenadier, S. R., 1995, "The Persistence of Real Estate Cycles," v10, p95  
 Berkovec, J. A., G. B. Canner, S. A. Gabriel, and T. H. Hannan, 1994, "Race, Redlining, and Residential Mortgage Loan Performance," v9, p263  
 Williams, J. T., 1991, "Real Estate Development as an Option," v4, p191  
 Yezer, A. M. J., R. F. Phillips, and R. P. Trost, 1994, "Bias and Estimates of Discrimination and Default in Mortgage Lending: The Effects of Simultaneity and Self-Selection," v9, p197

*REE*

- Gyourko, J., and D. B. Keim, 1992, "What Does Real Estate Tell Us About Real Estate Returns?," v20, p457  
 Chan, K. C., P. H. Hendershott, A. B. Sanders, 1990, "Risk and Return on Real Estate: Evidence from Equity REITs," v18, p431  
 Geltner, D., 1989, "Estimating Real Estate's Systematic Risk from Aggregate Level Appraisal-Based Returns," v17, p463  
 Linneman, P., and S. Wachter, 1989, "The Impacts of Borrowing Constraints on Homeownership," v17, p389  
 Case, K. E., and R. J. Shiller, 1990, "Forecasting Prices and Excess Returns in the Housing Market," v18, p253  
 Haurin, D., 1988, "The Duration of Marketing Time of Residential Housing," v16, p396  
 Voith, R., and T. Crone, 1988, "Vacancy Rates and the Persistence of Shocks in the U.S. Office Markets," v16, p437  
 Wheaton, W. C., and R. G. Torto, 1988, "Vacancy Rates and the Future of Office Rents," v16, p430  
 Yavas, A., 1992, "A Simple Search and Bargaining Model of Real Estate Markets," v20, p533  
 Case, B., H. O. Pollakowski, and S. M. Wachter, 1991, "On Choosing Among House Price Index Methodologies," v19, p286  
 Giliberto, S. M., 1988, "A Note on the Use of Appraisal Data in Indexes of Performance Measurement," v16, p77
-

Table 12. Top cited papers in *JREFE* and *REE* by topic and technique.

	Citations	Individual Reference
Topic		
Appraisal	55	Geltner, D., 1991, "Smoothing in Appraisal-Based Returns," <i>JREFE</i> , v4, p327
Brokerage	34	Yavas, A., 1992, "A Simple Search and Bargaining Model of Real Estate Markets," <i>REE</i> , v20, p533
Housing	51	Linneman, P., and S. Wachter, 1989, "The Impacts of Borrowing Constraints on Homeownership," <i>REE</i> , v17, p389
Institutions	13	Capozza, D. R., and G. A. Sick, 1991, "Valuing Long-term Leases: The Option to Redevelop," <i>JREFE</i> , v4, p209
Investments	62	Gyourko, J., and D. B. Keim, 1992, "What Does Real Estate Tell Us About Real Estate Returns?," <i>REE</i> , v20, p457
Mortgages	28	Berkovec, J. A., G. B. Canner, S. A. Gabriel, and T. H. Hannan, 1994, "Race, Redlining, and Residential Mortgage Loan Performance," <i>JREFE</i> , v9, p263
Nonresidential	37	Voith, R., and T. Crone, 1988, "National Vacancy Rates and the Persistence of Shocks in the U.S. Office Markets," <i>REE</i> , v16, p437
Public policy	14	Olsen, E. O., 1988, "What Do Economists Know About the Effect of Rent Control on Housing Maintenance?," <i>JREFE</i> , v1, p295
Technique		
Empirical	62	Gyourko, J., and D. B. Keim, 1992, "What Does Real Estate Tell Us About Real Estate Returns?," <i>REE</i> , v20, p457
Method	55	Geltner, D., 1991, "Smoothing in Appraisal-Based Returns," <i>JREFE</i> , v4, p327
Review	24	Dunn, K. B., and C. S. Spatt, 1988, "Private Information and Incentives: Implications for Mortgage Contract Terms and Pricing," <i>JREFE</i> , v1, p47
Simulation	29	Grenadier S. R., 1995, "The Persistence of Real Estate Cycles," <i>JREFE</i> , v10, p95
Theory	37	Quan, D. C., and J. M. Quigley, 1991, "Price formation and the Appraisal Function in Real Estate Markets," <i>JREFE</i> , v4, p127

The inadequacy of the SSCI data for identifying coauthors makes it necessary to manually count individual citations. We use a two-step approach to keep the task manageable. In step one, we use the bibliographies from papers published in *JREFE*, *REE*, and *JRER* to manually count the number of citations to *all* authors and coauthors of papers published in *JREFE* and *REE*. (The last column in Table 13 reports these citation counts.) We then rank all of these authors by their *JREFE*, *REE*, and *JRER* citation counts and identify the top 25 authors in this set. In step two, we manually count the total number of citations in *JREFE*, *REE*, and *JRER* bibliographies to all of these 25 authors' papers regardless of where the cited paper was published and regardless of their order in the list of coauthors. The resultant citation count measures the broad overall contribution of these 25 authors to real estate research.

The first two columns of Table 13 report the results based on this impact measure. As is usual in such rankings, the citation counts exhibit a steep decline at the top ranks that quickly levels off. C. F. Sirmans, Patrick Hendershott, and David Geltner are the top three

Table 13. Top cited authors in *JREFE*, *REE*, and *JRER*, 1988–2001.

Rank	Author	Citations to All Papers	Citations to <i>JREFE</i> and <i>REE</i> Papers Only
1	Sirmans, C. F.	627	133
2	Hendershott, P. H.	478	189
3	Geltner, D. M.	346	256
4	Shilling, J. D.	261	69
5	Quigley, J. M.	259	99
6	Kau, J. B.	253	66
7	Hartzell, D. J.	225	70
8	Wheaton, W. C.	205	92
9	Ling, D. C.	192	79
10	Wachter, S. M.	188	123
11	Clapp, J. M.	184	102
12	Haurin, D. R.	171	121
13	Linneman, P. D.	155	71
14	Giliberto, S. M.	151	65
15	Liu, C. H.	147	108
16	Vandell, K. D.	146	68
17	Capozza, D. R.	145	64
18	Wang, K.	125	68
19	Gyourko, J.	124	88
20	Yavas, A.	122	64
21	Pollakowski, H. O.	112	71
22	Mei, J. P.	103	87
23	Miceli, T. J.	98	78
24	Torto, R. G.	96	75
25	Sanders, A. B.	82	66

authors with the greatest impact on real estate research published in *JREFE*, *REE*, and *JRER* over the sample period. Their 1,451 combined citations almost equal the 1,583 combined citations of the rest of the top 10 authors identified in the table.

One of the patterns that emerged earlier was that the citation pattern varies across topic areas and technique niches. While Table 13 identifies those individuals whose bodies of work have had the greatest impact on subsequent real estate research, it does not identify individuals' contributions by topic or technique. To do so, Table 14 lists the top cited authors within each of the technique while Table 15 lists the top five cited authors within each of the topic areas. These rankings are based upon citations from the bibliographies of *JREFE*, *REE*, and *JRER* to the listed authors' papers published in *JREFE* and *REE*. Each author's cumulative citations pertain only to his or her papers published within the indicated category.

David Geltner is the only top cited author in both more than one technique (empirical and method). Geltner is also the top cited author writing in appraisal. James B. Kau is the top cited author in both the simulation technique category and the mortgages topic area.

Table 14. Top cited authors of papers in *JREFE* and *REE* by technique.

Technique	Author	Citations
Empirical	Geltner, D. M.	163
	Hendershott, P. H.	150
	Sirmans, C. F.	112
	Liu, C. H.	104
	Wachter, S. M.	90
Method	Geltner, D. M.	55
	Case, B.	33
	Pollakowski, H. O.	33
	Wachter, S. M.	33
	Meese, R. A.	24
Review	Wallace, N. E.	24
	Haurin, D. R.	33
	Hendershott, P. H.	33
	Dunn, K. B.	24
	Scott, C. S.	24
Simulation	Hooks, D. L.	19
	Zumpano, L. V.	19
	Kau, J. B.	56
	Keenan, D. C.	51
	Ling, D. C.	47
Theory	Geltner, D. M.	38
	Follain, J. R.	35
	Miceli, T. J.	69
	Arnott, R.	54
	Yavas, A.	49
	Quan, D. C.	37
	Quigley, J. M.	37
	Read, C.	37

Not surprisingly, many of the top ranked authors appearing in Table 13 also appear in the narrower contribution rankings by topics and technique categories in Tables 14 and 15. The citation counts in the different tables reveal that their overall contributions to the literature are broader than their contributions within their individual topic areas.

Another interesting observation is the range of citations for the top cited authors across techniques and topics. Generally, except for mortgages, authors writing in the more popular topics have more citations than the top authors writing in less popular topics. The distribution of citations across top authors using different techniques generally reflects the relative popularity of the different techniques in these journals. This point should be kept in mind when using citation counts to assess an individual's research for evaluation or promotion purposes.

Table 15. Top cited authors of papers in *JREFE* and *REE* by topic.

Topic	Author	Citations
Appraisal	Geltner, D. M.	131
	Clapp, J. M.	76
	Hendershott, P. H.	73
	Haurin, D. R.	61
	Case, K. E.	49
	Shiller, R. J.	49
Brokerage	Zumpano, L. V.	62
	Miceli, T. J.	59
	Yavas, A.	56
	Elder, H. W.	43
	Anglin, P. M.	29
Housing	Linneman, P. D.	51
	Wachter, S. M.	51
	Haurin, D. R.	49
	Read, C.	37
	Arnott, R.	30
Institutions	Capozza, D. R.	13
	Sick, G. A.	13
	Hadan, B.	7
	Rudolph, P. M.	7
	Speyrer, J. F.	6
Investments	Liu, C. H.	108
	Geltner, D. M.	89
	Gyourko, J.	87
	Mei, J. P.	80
	Sanders, A. B.	66
Mortgages	Kau, J. B.	66
	Keenan, D. C.	51
	VanOrder, R.	45
	Quigley, J. M.	44
	Muller, W. J.	42
Nonresidential	Wheaton, W. C.	73
	Torto, R. G.	57
	Sirmans, C. F.	48
	Benjamin, J. D.	39
	Voith, R. P.	38
Public policy	Olsen, E. O.	14
	Heffley, D. R.	8
	McDonald, J. F.	8
	Turner, B.	8

## 7. Conclusion

This paper examined the pattern of publication and citation in two core academic real estate journals, *JREFE* and *REE*, focusing on the relative popularity of topics and techniques over the 14-year period 1988–2001. Real estate literature is clearly dominated by certain topics and there is a surprising amount of stability over the sample period. Although the specific questions within the broad topic areas change over time, the broad topic areas have stayed surprisingly stable in terms of journal space. Similarly, the specific empirical techniques have also changed over time, but real estate remains a largely empirical field, as revealed by both the proportion of journal space dedicated to empirical studies and the relative citation patterns.

With respect to the two journals, we see convergence in the topics and techniques of research published in each over time. The sources for published research (measured by sources cited) and the contributions of real estate (measured by citations) also reveal convergence for the two journals over the 14-year period.

We also used citation counts to rank individual papers appearing in each of the journals within topic category and technique classification and individual authors. As expected, topic contributors (in terms of citations to their work) tend to specialize in one topic area or technique category. Also as expected, the top cited papers or authors in each topic or technique tend to garner citations that vary with the relative popularity of those topics or techniques in the two core real estate journals examined here. Somewhat surprisingly, though, top cited individual authors tend to have significantly greater overall impacts on the broader real estate literature than indicated by their contributions within individual topic or technique categories. For many of these individuals, their impact on real estate research comes from the large body of their work rather than a subset of papers published within a single narrow topic category.

## Notes

1. We gathered citations from papers in *JRER* manually in order to include them in our citations count.
2. Comparative statistics can be informal, depicted graphically, or derived formally. We do not require mathematical formalism in order to classify a paper as theoretical.
3. See the survey of the profession by Diaz et al. (1996). *Regional Science and Urban Economics* is not included in that survey but Ong et al. (2001) and Dombrow and Turnbull (2002) identify it as a significant outlet for real estate research. The cross-citation patterns observed here provide further evidence of the role of *RSUE* as a journal publishing a significant amount of real estate research.
4. Some econometric and statistical methods papers are under-cited in the real estate literature, a common dilemma for methodology contributions that enter the mainstream. For example, few researchers using 2SLS cite the original sources of the method. Conversely, inclusion as a named subroutine in statistical software may enhance the number of citations in this literature (e.g., White, 1980).
5. Although often used as an argument against using citation counts to measure impact, we think the role of negative or critical citations distorting the citation count-impact nexus is over-stated in most cases. Errors can be quickly identified in the literature with few subsequent citations. We also believe that the “fruitful error,” in which an error or incorrect conjecture stimulates a flurry of work extending the subsequent corrections (Cole and Cole, 1971), is an extremely rare event and so does not appreciably distort the citation-impact connection.
6. This difference is significant in a regression of the cumulative number of citations of each paper on a third degree polynomial of time since publication, a *REE* dummy variable, and a dummy variable for special issues.

There is, however, no difference between citations of papers in special issues versus regular issues of the journals at the 10 percent or lower level.

7. Approximately one quarter of papers have zero citations after five years in print, the average is less than one citation per year. These numbers are surprisingly close to the citation patterns in the *Journal of Regional Science*. Strathman (1992) finds that approximately 17 percent of the articles published in 1967–1980 garnered zero citations within five years of publication.
8. The citations are calculated from the SSCI and so are based on journals covered by that index. Because *JRER* is not included in the SSCI, *JRER* citations were manually counted and added to the SSCI totals in order to improve the measure of real estate journal coverage.

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