

# World Ranking of Real Estate Research: Recent Changes in School Competitiveness and Research Institutions

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**Abstract** Real estate programs are ranked based upon page counts of articles published in three major real estate journals. The page counts are employed to capture many variations in the length of articles. For each author, his/her most recent affiliation is used to evaluate the school competitiveness of current faculty members rather than a perceived school reputation of the past. In this study, we find that top-tier schools in real estate research are not necessarily the most famous schools in economics and finance; progressive universities specializing in real estate research hold the top ranks. Furthermore, school competitiveness has changed substantially in the United States. The changes are mainly because of a mobility of faculty members. The results also show that U.S. institutions dominate research in real estate.

**Keywords** World ranking · Real estate research · School competitiveness

**JEL Classifications** A10 · A14 · A20

## Introduction

There are numerous studies of university rankings in economics and finance. However, real estate research has neither been counted for the rankings of economics nor for finance programs. Although a late comer, real estate research has been growing rapidly in accordance with the growing importance of the role of real estate markets in the economy. This rapid growth also raised people's interest in searching

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for competitive research universities. Sa-Aadu and Shilling (1988) ranked universities worldwide based on the number of articles published in the first specialized journal *Real Estate Economics*, while Hardin et al. (2006) used subsequent citations of papers as a measure of article popularity. Clauretie and Daneshvary (1993) used another specialty journal, *Journal of Real Estate Research*, to rank universities; the rankings were recently brought up to date by Urbancic (2007). The third specialty journal, *Journal of Real Estate Finance and Economics*, was counted separately by Dombrow and Turnbull (2000), while another study by Dombrow and Turnbull (2002) combined all three real estate journals, plus five other journals most related to real estate. Recently, all these rankings were updated and synthesized by Chan et al. (2008) after adding one more journal.

All of these studies evaluated schools based on author affiliations at the time of publication. Nothing is wrong with this approach, but more robust would be the changes in the competitiveness of current faculty members rather than a perceived school reputation of the past. For example, Hogan (1984), Conroy et al. (1995), and Scott and Mitias (1996), among others, used the current affiliation of authors to rank U.S. universities in economics; Jin and Yao (1999) and Jin and Hong (2008) also used current affiliations for Asian university rankings in economics; and this type of using current affiliation is getting popular in other areas as well (see Heck (2007), among others, for the ranking of finance Ph.D. programs). The use of current affiliations for school ranking is similar to gauging the reputation of a sports team. Successful matches during a season depend upon how competitive current team members are rather than on their past rosters. However, no such ranking studies in the real estate literature have used the current affiliation of authors.<sup>1</sup>

One important advantage of using current faculty's research productivity is that we can identify recent changes in the competitiveness of world universities. For example, when a fine research scholar enters a job market, universities are buying his or her future flow of research as well as the stock of past and current research the scholar would bring to the university. Such mobility of research-active scholars may either improve or worsen school competitiveness depending on the degree of openness of universities toward high profile researchers worldwide. Hence, it is useful for school administrators, government policy makers and businessmen, as well as academia, to identify which schools are rising or falling based on current faculty members.

Another advantage of using current affiliations is to provide most updated information for graduate students who would like to study real estate. More specifically, if a school is located in a city with a heavy fluctuation of property prices, such an environment may encourage the school to produce more real estate research (e.g. Porter 1990). Higher research activities may also get financial supports from the government in the form of research grants. Based upon such comparative advantages, the school can specialize in the production of real estate research. The specialization of research in one specific field may have spillover effects on other related areas as well, and hence it will enhance a school's overall reputation. Research-active scholars also attract more talented students from overseas.

<sup>1</sup> Chan et al. (2008, Exhibit 5) attempted to identify the current affiliations of individual authors, but it was not directly used to construct school rankings.

Therefore, this type of information on current research activities is especially important to research students. If the students simply applied to a graduate school based on its perceived past fame, but research-active scholars recently moved to another school (or retired), it would prove frustrating to research-motivated graduate students.<sup>2</sup>

## Methodology and Data

To achieve these goals, several criteria should be used. First, this paper counts the pages of the articles that were published in three major specialty journals: *Journal of Real Estate Finance and Economics (JREFE)*, *Journal of Real Estate Research (JRER)*, and *Real Estate Economics (REE)*. The page counts used here are similar to the page counts of the eight ‘blue-ribbon’ economics journals in Dusansky and Vernon (1998). In this case, general journals, such as *American Economic Review (AER)*, were not counted here because real estate research seldom appears in the top general journals. Other field journals that are partly related to real estate were not counted either because these journals included some articles that are not directly related to real estate issues; it was also difficult to differentiate all these articles sharply. The pages published in the three core journals of real estate research were converted to *JREFE*-equivalent length pages. More specifically, the number of words was counted for three typical pages in each journal that did not include equations, tables and figures, and an average was taken to reduce variations in quantity. Based upon the average number of words in a *JREFE* page, the page weights used are:  $JREFE = 1.00$ ,  $JRER = 0.92$  and  $REE = 0.85$ . In other words, total pages published were standardized to a size of *JREFE*. This type of page count, rather than simply counting the number of articles published, allows the greater intellectual contributions of longer articles to be represented.<sup>3</sup>

Second, publications by most recent faculty members are used here to evaluate changes in the competitiveness of current members as a team (e.g. Jin and Hong 2008). For each author, his/her most recent affiliation was updated and re-confirmed from school websites (as of November 2009), and their stock of past and current publications reflects how competitive each school is in the field of real estate research. It should be noted that many authors moved from school to school. The frequent mobility of research-active scholars is not surprising, given the fact that a number of fine research scholars have been increasingly appreciated at the job market and moved to better known universities locally or overseas. Unlike other ranking studies in economics or finance, the detection of current affiliation of

<sup>2</sup> Of course, a recent development of the Internet facilitates the search of individual faculty members without much difficulty, but the relative research productivity of current faculties is not available in public. This paper thus attempts to conduct the first systematic comparison of research-active scholars worldwide in the field of real estate.

<sup>3</sup> One might object to this type of school ranking because all journals were equally weighted in quality. Quality-adjusted rankings in the literature employed ‘impact factors’ for top-tier economics journals (e.g. Conroy et al. 1995); different groups of quality journals were also used for a broad number of journals (e.g. Scott and Mitias 1996). But for the three specialty journals used here, their impact factors fluctuate year by year and, on balance, their impact factors may turn out to be nearly identical. Grouping quality journals is also subjective.

authors was difficult because research-active scholars in real estate could be found not only in real estate departments, but also in finance, economics, architecture, or even in construction and engineering departments. Because of this peculiar phenomenon of real estate research, we employed all types of search engines through the Internet. Retired professors were presumed less active in education and thus not counted as current team members even if at present affiliated with their schools as emeritus professors. By contrast, some authors had established their own consulting firms after retirement, while others were deceased. Several Ph.D. students who got a teaching post after publishing papers while in school were also detected to find their new affiliations.

In addition, most papers were found to be coauthored, and thus the pages published were divided by the number of coauthors and equally credited to each coauthor. If the coauthors were affiliated to more than one institution (i.e. joint appointments), the pages of a particular article assigned to each coauthor were, again, divided by the number of joint appointments and credited equally to each affiliated institution. Finally, the whole sample period 1973–2008 was initially used for computing the world ranking. To find out more about recent changes in research competitiveness of universities, most recent 10 years 1999–2008 is used separately for the rankings of U.S. and non-U.S. universities. Over 800 universities and research institutions worldwide were found involved in real estate research, and the eventual data file in Excel contained approximately 5,000 lines in total.

## World Ranking

Table 1 shows JREFE-equivalent length pages for top-50 universities worldwide over the entire sample period 1973–2008. As noted earlier, world universities and research institutions are ranked based on research output of current affiliations (as of November 2009). This type of ranking, which is based on the current affiliation of authors, takes into account the most recent movements of scholars; thus recent changes in the competitiveness of schools can be identified. The results are reported in the column of (1). Alternatively, page counts can be done based on author affiliations at the time of publication, which is most commonly used in the literature. It is the basis for our original data set as well. The results are reported in the column of (2). The difference between the two ways of page counts appears in the last column of the table. In this way, we can identify which schools are recently more productive in academic research and competitively rising, and which schools are falling with less prolific faculty members. If the changes are positive, current faculty members are, on average, regarded as research active and competitive; the competitiveness may fall if the signs are negative. Among 800 universities and research institutes worldwide, only the 50 best performers are reported in Table 1.

The University of Connecticut (UConn) was found to rank as the top school in the world for real estate research. Its total publication in the three major real estate journals is prominently greater than the rest of the schools and its rank as number one is robust and remains intact regardless of the use of old or new faculty members over different sample periods. Florida State University (FSU) publishes total pages similar to those of UConn and ranks second. If the published pages were counted

**Table 1** World ranking of real estate research: JREFE-equivalent pages, 1973–2008

Rank	Institution	Country	Pages based on current affiliations (Nov 2009) (1)	Pages based on affiliations at the time of publication (2)	(1)–(2)
1	U Connecticut	U.S.A	858.23	1376.02	–517.79
2	Florida State U	U.S.A	806.70	310.68	496.02
3	U Florida	U.S.A	589.49	669.18	–79.69
4	UC, Berkeley	U.S.A	535.29	655.81	–120.52
5	Georgia State U	U.S.A	518.87	513.94	4.93
6	MIT	U.S.A	499.59	435.87	63.72
7	Penn State U	U.S.A	487.02	514.95	–27.93
8	National U Singapore	Singapore	486.82	509.19	–22.37
9	DePaul U	U.S.A	432.33	113.17	319.16
10	U Wisconsin, Madison	U.S.A	392.60	637.55	–244.95
11	UC, Irvine	U.S.A	374.64	2.43	372.21
12	UC, Los Angeles	U.S.A	330.39	412.62	–82.23
13	U Pennsylvania	U.S.A	327.72	494.63	–166.91
14	U Cincinnati	U.S.A	325.03	423.81	–98.78
15	Cornell U	U.S.A	324.40	181.56	142.84
16	U Georgia	U.S.A	320.39	584.96	–264.57
17	U Southern California	U.S.A	284.89	521.55	–236.66
18	California State U, Fullerton	U.S.A	283.14	310.24	–27.10
19	Federal Reserve Board	U.S.A	272.70	667.25	–394.55
20	Cleveland State U	U.S.A	271.09	758.26	–487.17
21	U Nevada, Las Vegas	U.S.A	262.02	227.43	34.59
22	CUNY, Baruch	U.S.A	255.98	58.37	197.61
23	Virginia Commonwealth U	U.S.A	250.49	78.04	172.45
24	Roulac Group, Inc.	U.S.A	239.74	225.94	13.80
25	U Michigan, Ann Arbor	U.S.A	233.29	273.55	–40.26
26	American U	U.S.A	232.95	422.06	–189.11
27	Clemson U	U.S.A	230.31	77.61	152.70
28	U Texas, San Antonio	U.S.A	223.21	170.40	52.81
29	George Washington U	U.S.A	222.37	256.07	–33.70
30	Brigham Young U	U.S.A	220.63	243.25	–22.62
31	Yale	U.S.A	217.64	182.17	35.47
32	LSU Baton Rouge	U.S.A	213.69	501.10	–287.41
33	Marquette U	U.S.A	213.12	50.77	162.35
34	U Alabama, Tuscaloosa	U.S.A	209.17	273.36	–64.19
35	Harvard	U.S.A	205.21	232.46	–27.25
36	U Texas, Austin	U.S.A	194.55	245.51	–50.96
37	U North Carolina, Chapel Hill	U.S.A	187.11	429.55	–242.44
38	U North Carolina, Charlotte	U.S.A	185.11	71.26	113.85
39	City U London	U.K	180.32	145.66	34.66

**Table 1** (continued)

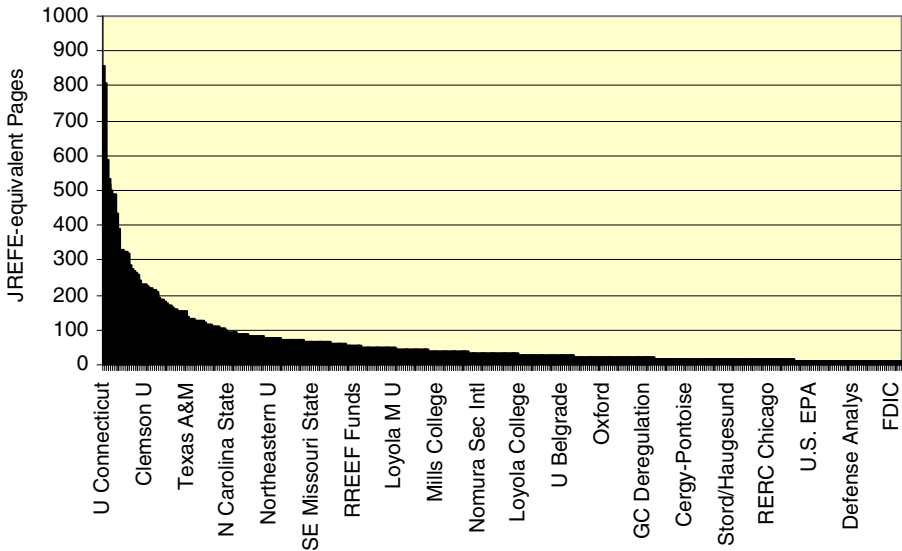
Rank	Institution	Country	Pages based on current affiliations (Nov 2009) (1)	Pages based on affiliations at the time of publication (2)	(1)–(2)
40	U Memphis	U.S.A	176.18	35.96	140.22
41	Freddie Mac	U.S.A	174.27	311.86	–137.59
42	U Colorado, Boulder	U.S.A	169.96	52.25	117.71
43	Simon Fraser U	Canada	169.71	126.61	43.10
44	Florida International U	U.S.A	164.49	88.81	75.68
45	U Reading	U.K	161.69	290.19	–128.50
46	Fannie Mae	U.S.A	157.17	309.10	–151.93
47	U Hong Kong	Hong Kong	156.56	140.09	16.47
48	Maastricht U	Netherlands	155.01	106.28	48.73
49	Temple U	U.S.A	154.54	155.27	–0.73
50	U South Alabama	U.S.A	153.17	37.03	116.14

Values are JREFE-equivalent length pages. The page weights used are: JREFE = 1.00, JRER = 0.92, REE = 0.85

based on author affiliations at the time of publication, FSU would drop to 26th place. The rapid growth of FSU is largely linked to the work of C.F. Sirmans who recently moved to FSU from UConn. The next immediate followers are University of Florida (3rd), UC Berkeley (4th), and Georgia State University (5th). After that, smaller variations are found among MIT (6th), Penn State (7th), and National University of Singapore (8th). For these schools, smaller changes are also observed between two different types of page counts. In other words, these schools remain competitive. However, the research output of Wisconsin-Madison (10th) drops by 38% when current affiliations are used. Similar drops are also observed in University of Georgia (16th) and University of Southern California (17th). Even worse is Cleveland State University (20th), whose current research output falls by more than 60%. Some may also be surprised by Louisiana State University's 32nd place finish when recent affiliations are used. The fall of these schools is mainly due to the retirements, deaths, and mobility of research-active scholars in recent years.

In contrast, several lesser known schools entered the top tier. For example, National University of Singapore (8th) and DePaul University (9th) are in this category. Other than that, weak research performance in lower ranks appears to be similar to each other, and the rankings may change dramatically if one star professor moves in. Figure 1 also shows that the gap among top-tier schools appears to be relatively large and distinct, while publications in lower ranks slowly decrease and are nearly of the same height. This type of the publication-based ranking is generally a good approximation of Zipf's (1949) law to the rank-size regularity of research output in which the publication size of a school is inversely proportional to its school ranking.<sup>4</sup>

<sup>4</sup> The results are available upon request. Jin (2009) shows a similar finding. Other examples are Mantegna and Stanley (1995) on the S&P index, and Ulubasoglu and Hazari (2004) on tourism.



**Fig. 1** World ranking based on current affiliation of authors (500 institutions worldwide). Notes: Three specialty journals in real estate were counted pages for 500 universities and research institutes worldwide over the period 1973–2008. The current affiliation of authors (as of November 2009) was used. The numbers in the vertical axis are JREFE-equivalent length pages. Institution names in the horizontal axis appear only in every 26th ranking

Notice, however, that top-tier schools in real estate are not necessarily best known schools in economics or finance. Some renowned universities, such as MIT, Yale, Harvard, Cambridge, among others, publish less in the field of real estate. It is also interesting to find that U.S. universities dominate the research in real estate. Nearly 90% of the top-50 schools are located in the U.S. More detail on recent school competitiveness is discussed below.

### School Competitiveness over the Most Recent Ten Years

Table 2 ranks U.S. universities only, based on real estate research for the most recent 10 years of publications by current faculty members. The page counts of current faculty members (as of November 2009) for the most recent ten-year period (1999–2008) allow us to identify which schools are more active in recent research rather than the research of earlier decades. The recent research, of course, does not necessarily mean the proportion of the research conducted by junior members only, since many seniors are still active in research. Hence, the results in Table 2 disclose which schools are, overall, rising these days and which schools are falling. Again, University of Connecticut ranks first, Florida State University second and University of Florida third. Other than that, the ranking of top-tier schools varies competitively. For example, compared to the ranking in Table 1 that uses the entire sample period, the school rankings in this table that employ the most recent 10 years rise prominently for USC (8th), Brigham Young (9th) and Florida International (18th),

**Table 2** Ranking of U.S. universities: 1999–2008 (most recent 10 years)

Rank	Institution	Pages	Rank	Institution	Pages
1	U Connecticut	443.38	26	George Washington	120.02
2	Florida State U	378.89	27	Colorado, Boulder	116.67
3	U Florida	365.82	28	UC Irvine	112.76
4	Georgia State U	265.25	29	Mississippi State	106.57
5	MIT	246.60	30	Texas, San Antonio	104.48
6	Penn State U	235.56	31	U Memphis	98.73
7	DePaul U	225.94	32	American U	97.83
8	USC	214.85	33	Syracuse U	92.07
9	Brigham Young U	208.15	34	OSU Columbus	91.67
10	UCLA	207.04	35	Alabama, Tuscaloosa	83.14
11	Wisconsin, Madison	203.07	36	Wichita State U	82.68
12	Cal State, Fullerton	197.71	37	Yale	80.51
13	UC, Berkeley	195.54	38	Florida Atlantic U	80.16
14	Virginia Commonwealth	172.26	39	U Louisville	71.94
15	U Cincinnati	171.07	40	UNC Greensboro	69.83
16	U Georgia	155.95	41	Cleveland State U	69.71
17	U Penn	154.08	42	U Washington	68.01
18	Florida Int'l U	152.07	43	U Central Florida	67.33
19	UNC Charlotte	141.75	44	College Charleston	63.55
20	Cornell U	139.87	45	LSU Baton Rouge	62.66
21	Marquette U	138.97	46	U South Alabama	62.10
22	UNLV	124.82	47	George Mason U	61.83
23	Middle Tennessee	122.19	48	U Texas, Austin	60.77
24	Michigan, Ann Arbor	121.42	49	Hofstra U	56.37
25	CUNY, Baruch	120.03	50	U Delaware	55.98

See Table 1

while UC Berkeley's rank falls to 13th, and UC Irvine's to 28th. Many ups and downs are also observed in the rest of the schools.

Table 3 examines the recent research competitiveness of non-U.S. universities. As expected, National University of Singapore (NUS) ranks top among non-U.S. schools. The NUS economics department is relatively large and its departmental ranking, in general, steadily appears among the top five in Asia.<sup>5</sup> However, NUS is particularly equipped with active faculty members in real estate research. Their publications especially in this area appear to bear a favorable comparison with top U.S. universities. City U of London ranks second, Simon Fraser University in Canada third and Technion Israel Institute of Technology fourth. The immediate follower is City University of Hong Kong (5th). CityU would also rank 22nd in the U.S. ranking

<sup>5</sup> For Asian rankings of the economics profession, see, for example, Jin and Hong (2008) and Jin and Yao (1999).



**Table 3** Ranking of non-U.S. universities: 1999–2008 (most recent 10 years)

Rank	Institution	Country	Pages
1	National U Singapore	Singapore	463.82
2	City U London	U.K	180.32
3	Simon Fraser U	Canada	151.43
4	Technion Israel Institute of Technology	Israel	127.30
5	City U Hong Kong	Hong Kong	125.12
6	Cambridge	U.K	120.36
7	U Reading	U.K	119.03
8	Maastricht U	Netherlands	102.75
9	Chinese U Hong Kong	Hong Kong	102.70
10	U Hong Kong	Hong Kong	94.26
11	U Amsterdam	Netherlands	88.94
12	Royal Institute of Technology	Sweden	79.44
13	Erasmus U Rotterdam	Netherlands	76.04
14	U British Columbia	Canada	67.60
15	Manchester Business School	U.K	66.98
16	Yuan Ze U	Taiwan	65.17
17	U Geneva	Switzerland	63.64
18	U Aberdeen	U.K	62.08
19	National Taiwan U	Taiwan	60.55
20	Laval U	Canada	57.27

See Table 1

(Table 2). It is not surprising to find such high ranking of CityU, given the productivity of research-active scholars in its College of Business and related departments, as well as the openness of the university toward high profile researchers worldwide.

In addition, the previous top European schools in Table 1, which was based on author affiliations at the time of publication, are now found to be reversed in their current rankings in Table 3. For example, the column (2) in Table 1 shows that U of Reading (290.19 pages) had more productive faculty members than City U of London (145.66 pages) over the past three decades. By contrast, Table 3 shows that the publication of City U of London (180.32 pages) based on the current affiliation of authors for the most recent 10 years is now greater than that of U of Reading (119.03 pages). Perhaps, recently, more productive scholars moved to City U of London. Accordingly, City U of London currently ranks number one in Europe, while U of Reading falls to third, after Cambridge. As in U.S. universities, the competitiveness of top-tier universities in Europe has shifted over the past decade; the changes are, however, smaller for lower-ranked schools.<sup>6</sup>

<sup>6</sup> It is also noted that the research emphasis seemed to be reduced noticeably at the University of New South Wales in Australia. Even worse was the University of Technology Sydney in Australia. Further rankings below 20th are available upon request.

**Table 4** Ranking of non-academic research institutions: 1999–2008 (most recent 10 years)

Rank	Institution	Country	Pages
1	Federal Reserve Board	U.S.A	197.14
2	Comptroller of Currency	U.S.A	119.10
3	Roulac Group, Inc.	U.S.A	115.62
4	Freddie Mac	U.S.A	108.35
5	CRA International	U.S.A	60.55
6	Fannie Mae	U.S.A	57.31
7	Space Analytics, LLC	U.S.A	57.04
8	Property and Portfolio Research	U.K	54.28
9	LoanPerformance	U.S.A	51.06
10	Econsult Corporation	U.S.A	45.27
11	John Hancock Real Estate Investment Group	U.S.A	42.32
12	Torto Wheaton Research	U.S.A	41.54
13	Cornerstone Realty Advisers	U.S.A	40.32
14	RREEF Funds	U.S.A	37.26
15	Electrum Partners	U.S.A	36.80
16	Real Property Analytics, Inc.	U.S.A	35.88
17	Europa Capital Partners	U.K	35.26
18	Case Shiller Weiss, Inc.	U.S.A	34.18
19	King Sturge & Co.	U.K	34.04
20	Henderson Global Investors Inc.	U.S.A	32.20

See Table 1

Table 4 attempts to provide the first ranking of non-academic research institutions in the real estate literature. Real estate research is more applied and closely related to peoples' daily lives, and hence many business firms, as well as governments, have their own research institutions for academic research. The U.S. Federal Reserve Board traditionally produced heavy research outputs in real estate. Two other government-linked organizations, Freddie Mac and Fannie Mae, also published a lot in the past, but many active researchers there have recently moved to other research institutions including universities. It is also noted that U.S. institutions dominate the publications of non-academic research institutes.

### The Hall of Fame

Table 5 further ranks individual scholars based on the stock of their past publications in total over the entire sample period 1973–2008. Many scholars were found to have moved from school to school, and some people retired or passed away. To construct the 'hall of fame' in real estate research, their life-time publications in three major journals were counted. Their current affiliations were updated through the Internet; several search engines were employed. C.F. Sirmans at Florida State University ranks world number one. It is interesting to find that his publications appear to

**Table 5** Hall of fame: 1973–2008

Rank	Authors	Current affiliations	Pages
1	Sirmans, C. F.	Florida State U	478.15
2	Webb, James R.	Cleveland State U <sup>b</sup>	375.48
3	Hendershott, Patric	Ohio State U <sup>a</sup>	283.92
4	Ling, David C.	U Florida	278.42
5	Vandell, Kerry D.	UC, Irvine	270.74
6	Ambrose, Brent W.	Penn State	248.58
7	Colwell, Peter F.	U of Illinois, Urbana-Champaign <sup>a</sup>	246.55
8	Clapp, John M.	U Connecticut	240.99
9	Turnbull, Geoffrey K	Georgia State U	239.86
10	Chinloy, Peter T.	American U	232.95
11	Shilling, James D.	DePaul U	225.44
12	Benjamin, John D.	American U <sup>a</sup>	220.85
13	Geltner, David M.	MIT	211.73
14	Jud, G. Donald	UNC-Greensboro <sup>a</sup>	211.70
15	Roulac, Stephen E.	Roulac Group, Inc.	207.54
16	Capozza, Dennis R.	U Michigan, Ann Arbor	191.41
17	Lacour-Little, Micha	California State U, Fullerton	178.78
18	Yavas, Abdullah	U Wisconsin, Madison	177.58
19	Wang, Ko	CUNY, Baruch	176.67
20	Sirmans, G. Stacy	Florida State U	164.13
21	Pace, R. Kelley	Louisiana State U, Baton Rouge	154.29
22	Rutherford, Ronald C	U Texas, San Antonio	139.55
23	Springer, Thomas M.	Clemson U	133.72
24	Epley, Donald R.	U South Alabama	131.00
25	Hardin III, William	Florida International U	130.13
26	Miceli, Thomas J.	U Connecticut	129.54
27	Eichholtz, Piet M.A.	Maastricht U	128.85
28	Clayton, Jim	Cornerstone Realty Advisers	123.78
29	Ghosh, Chinmoy	U Connecticut	123.14
30	Shilton, Leon G.	Fordham U <sup>a</sup>	120.47
31	Wheaton, William C.	MIT	120.02
32	Pavlov, Andrey D.	Simon Fraser U	119.68
33	Downs, David H.	Virginia Commonwealth U	119.08
34	Goetzmann, William N	Yale	118.48
35	Graff, Richard A.	Electrum Partners	117.74
36	Liu, Crocker H.	Cornell	117.37
37	Zumpano, Leonard V.	U Alabama, Tuscaloosa	116.34
38	Sa-Aadu, J.	U Iowa	114.30
39	Clauretie, Terrence	U Nevada, Las Vegas	113.78
40	Stevenson, Simon	City U London	113.58
41	Follain, James R.	James R Follain LLC	113.37
42	Young, Michael S.	RREEF Funds <sup>a</sup>	109.82

**Table 5** (continued)

Rank	Authors	Current affiliations	Pages
43	Ben-Shahar, Danny	Technion Israel Institute of Technology	108.60
44	Van Order, Robert A.	George Washington U	106.80
45	Riddiough, Timothy J	U Wisconsin, Madison	106.46
46	Brueckner, Jan K.	UC, Irvine	103.90
47	Manning, Christopher	Loyola Marymount U	101.78
48	Thibodeau, Thomas G.	U Colorado, Boulder	100.71
49	Weicher, John C.	Hudson Institute	100.29
50	Wachter, Susan M.	U Penn	100.01

See Table 1

<sup>a</sup> indicates retired

<sup>b</sup> indicate deceased

influence substantially the school ranking of his past affiliations in different decades. For example, Table 1 shows that LSU once ranked 13th in the world because of his major contribution there in the 1980s; U of Connecticut remained world number one because of Sirmans' significant contribution in the 1990s and early 2000s; and recently he brought up all his publications to his current affiliation FSU that is now world number two in real estate research.

In addition, James Webb played a key role at Cleveland State University (but has recently passed away). Patric Hendershott also retired from Ohio State University, in which his contribution represented more than half of OSU's real estate publications. Since the retired faculty members were not counted for current rankings, these people are likely to be the causes behind the fall of their school rankings. Other influential authors are Kerry Vandell at UC Irvine whose contribution represented more than two thirds of its publications; Peter Colwell whose recent retirement from U of Illinois Urbana-Champaign led to the fall of its ranking to 73rd; and James Shilling at DePaul University contributed approximately 70% of the improvement of the current school ranking to number nine. Many others also influenced school rankings substantially.

The results thus suggest that the mobility of research-active scholars affects the school rankings considerably. More specifically, the ranking of top-tier schools will rise if one or two star professors are newly hired. For lower-ranked schools, just one fine new scholar will improve their rankings substantially. In contrast, some schools recently fell in current rankings because of their loss of productive scholars. Hence, the current reputation of school competitiveness depends on how much the universities are open to hiring high profile researchers.

## Alternative Rankings

The world ranking of universities and research institutions in Table 1 was based on total number of pages published in three major real estate journals. However, the university ranking may change depending on which journals are counted and how

**Table 6** Alternative rankings based on small number of journals, 1973–2008

Rank	Institution	Rank1 (JREFE)	Rank2 (JRER)	Rank3 (REE)	Rank4 (JREFE + JRER)	Rank5 (JREFE + REE)	Rank6 (JRER + REE)	Highest rank	Lowest rank	S.D
1	U Connecticut	1	21	1	3	1	2	1	21	7.96
2	Florida State	3	1	4	1	2	1	1	4	1.26
3	U Florida	8	13	2	6	4	3	2	13	4.05
4	UC Berkeley	6	85	3	9	3	5	3	85	32.65
5	Georgia State	5	3	20	2	10	8	2	20	6.60
6	MIT	11	26	5	13	6	4	4	26	8.23
7	Penn State	4	41	11	5	5	10	4	41	14.18
8	Nat'l U Singapore	2	23	21	4	7	18	2	23	9.22
9	DePaul	16	25	7	14	8	6	6	25	7.26
10	Wisconsin, Madison	10	60	10	16	9	12	9	60	20.00
11	UC Irvine	30	80	6	43	11	7	6	80	28.75
12	UCLA	18	n.a	8	46	12	14	8	46	15.19
13	U Penn	34	67	9	47	14	9	9	67	23.71
14	U Cincinnati	9	19	35	7	18	24	7	35	10.25
15	Cornell	13	103	14	18	13	21	13	103	35.74
16	U Georgia	7	84	31	10	15	41	7	84	28.92
17	USC	20	n.a	12	49	16	22	12	49	14.60
18	Cal State, Fullerton	66	10	17	22	23	11	10	66	20.88
19	Fed Reserve Board	22	95	16	35	17	23	16	95	30.32
20	Cleveland State	51	4	79	11	61	16	4	79	30.80
21	UNLV	17	8	102	12	31	33	8	102	34.88
22	CUNY Baruch	78	11	19	29	29	15	11	78	24.55
23	Virginia Common	46	22	22	24	28	19	19	46	9.85
24	Roulac Group, Inc.	n.a	2	n.a	8	n.a	13	2	13	5.51
25	Michigan, Ann Arbor	29	262	15	54	19	28	15	262	96.09
26	American U	24	32	45	19	26	35	19	45	9.24
27	Clemson U	26	9	107	15	39	34	9	107	35.47
28	UT San Antonio	35	17	49	21	37	30	17	49	11.59
29	George Washington	12	166	50	20	21	66	12	166	57.78
30	Brigham Young U	100	14	27	36	40	20	14	100	31.18

Each ranking is based on page counts of the research output in each journal (journal names in parentheses) published by current faculty members in each institution (as of November 2009) over the entire sample period (1973–2008)

*JREFE* Journal of Real Estate Finance and Economics, *JRER* Journal of Real Estate Research, and *REE* Real Estate Economics. S.D stands for standard deviation. Not available (n.a) means no publication and hence no ranking available

many journals are included (Coupe 2003, among others). For example, some schools tend to publish only in one or two particular journals because authors, once accepted, normally get approved academically from the accepted journals. At the same time, journal editors also tend to minimize a potential risk of publishing mistakenly inaccurate papers (Laband and Piette 1994b). Thus, school rankings can be biased if only one journal is counted.<sup>7</sup> The potential sensitivity of the ranking is thus examined using the degree of variations of the ranks when a single journal is used. For the robustness of the results, two journals are combined to see any differences of the ranks.

Table 6 provides the results of six alternative rankings. The world ranking in Table 1 is used here as a benchmark rank. Six alternative rankings are computed in Table 6 based on page counts of the research output in each journal (journal names are in parentheses) published by current faculty members (as of November 2009) over the entire sample period (1973–2008). Basically, the same criterion is used as in Table 1. It is found that U of Connecticut concentrates in particular journals JREFE and REE, and publishes less in JRER. In contrast, FSU publishes more or less evenly in all three journals. Overall, the top-two schools UConn and FSU are essentially tied: both universities have ranked as world number one three times, as shown in this table. The table also computes some relevant statistics for comparison. The highest and lowest ranks provide evidence that top-tier schools are competitive at least in one journal, and thus the highest rank itself approximately shows best performers in order and identifies first- and second-tier universities worldwide.

The standard deviation (SD) that normalizes the sum of squared deviations from the mean ranking shows how much the rankings are sensitive to the selection of journals. For example, top-tier schools, except for UC Berkeley, are less sensitive to the journal selections, while variations are relatively wide in lower ranks. In other words, top-tier schools publish more or less evenly in three major journals and thus the selection of a particular journal may not significantly alter the overall ranking of top-tier schools. In contrast, many lower-ranked schools are skewed toward particular journals, and hence their school rankings would be sensitive to the selection of particular journals.

## Concentration Indexes

Table 7 further reports the concentration index for each institution as a measure of relative publication concentration in a particular journal. More specifically, institutions with heavy concentrations in a particular journal exhibit lower overall rankings, while top-tier institutions may have their publications diversified. The rise or fall of rankings may be due to the concentration or diversification of publications across three core journals. The calculation procedure is similar to the computation of ‘employment concentration’ for major cities in the United States (U.S. Bureau of Labor Statistics 2007).

<sup>7</sup> Most ranking papers in the real estate literature counted a single journal. See a brief review of the literature in “Introduction” for relevant discussion.

**Table 7** Concentration indexes

Rank	Institution	JREFE	JRER	REE	Total Pages	RPC (JREFE)	RPC (JRER)	RPC (REE)
1	U Connecticut	306.51	86.36	465.36	858.23	1.11	0.37	1.32
2	Florida State	250.16	270.54	286.00	806.70	0.97	1.24	0.86
3	U Florida	165.50	96.14	327.85	589.49	0.88	0.61	1.36
4	UC Berkeley	205.83	31.05	298.41	535.29	1.20	0.22	1.36
5	Georgia State	220.00	176.30	122.57	518.87	1.32	1.26	0.58
6	MIT	149.47	73.14	276.98	499.59	0.93	0.54	1.35
7	Penn State	244.00	54.58	188.44	487.02	1.56	0.42	0.94
8	Nat'l U Singapore	289.97	83.72	113.13	486.82	1.86	0.64	0.57
9	DePaul	127.14	77.58	227.61	432.33	0.92	0.67	1.28
10	Wisconsin, Madison	152.16	41.08	199.36	392.60	1.21	0.39	1.24
11	UC Irvine	75.42	33.58	265.64	374.64	0.63	0.33	1.73
12	UCLA	107.67	0.00	222.72	330.39	1.02	0.00	1.64
13	U Penn	69.67	37.72	220.33	327.72	0.66	0.43	1.64
14	U Cincinnati	154.93	87.50	82.60	325.03	1.49	1.00	0.62
15	Cornell	142.75	25.30	156.35	324.40	1.37	0.29	1.18
16	U Georgia	202.51	31.58	86.30	320.39	1.97	0.37	0.66
17	USC	106.16	0.00	178.73	284.89	1.16	0.00	1.53
18	Cal State, Fullerton	42.00	103.25	137.89	283.14	0.46	1.35	1.19
19	Fed Reserve Board	98.75	26.70	147.25	272.70	1.13	0.36	1.32
20	Cleveland State	52.34	175.54	43.21	271.09	0.60	2.40	0.39
21	UNLV	115.50	111.66	34.86	262.02	1.38	1.58	0.32
22	CUNY Baruch	35.30	97.90	122.78	255.98	0.43	1.42	1.17
23	Virginia Common	56.17	85.49	108.83	250.49	0.70	1.27	1.06
24	Roulac Group, Inc.	0.00	239.74	0.00	239.74	0.00	3.71	0.00
25	Michigan, Ann Arbor	76.33	7.82	149.14	233.29	1.02	0.12	1.56
26	American U	95.51	63.78	73.66	232.95	1.28	1.02	0.77
27	Clemson U	92.40	104.19	33.72	230.31	1.25	1.68	0.36
28	UT San Antonio	69.67	88.30	65.24	223.21	0.97	1.47	0.71
29	George Washington	144.32	14.72	63.33	222.37	2.03	0.25	0.69
30	Brigham Young U	28.50	96.14	95.99	220.63	0.40	1.62	1.06
Total Pages available		12770	10734	16343	39847			
Pages by top-30 institutions		3877	2421	4794	11092			
Concentration Index (%)		30.4	22.6	29.3				

See Tables 1 and 6. RPC stands for relative publication concentration in each journal for each institution

For each institution, the relative publication concentration (RPC) is computed here as the ratio of an institution's concentration in a particular journal to the world average concentration of the journal. That is,

$$\begin{aligned} \text{RPC}_{ij} &= \frac{\text{Institution } i\text{'s concentration in journal } j}{\text{World average concentration in journal } j} \\ &= \frac{\text{Inst } i\text{'s pub in journal } j / \text{Inst } i\text{'s total pub}}{\text{World pub in journal } j / \text{World pub in total}} \end{aligned} \quad (1)$$

where  $i$  = institution names, and  $j$  = journal names. We first compute the percentage of publications in each journal for each institution over the entire sample period. Second, the average percentage of world publications in each journal over the period is computed. Then, the relative index of publication concentration is the ratio of these two percentages. The relative index of 1.0 indicates an institution's publication concentration which is identical to the world average. For most top-tier institutions, the computed RPCs are close to 1.0. A few exceptions are U of Connecticut and UC Berkeley whose publications in JRER are substantially lower than the world average, whereas Penn State and NUS have published in JREFE a lot more than the world average. More variations are observed in lower-ranked institutions. The results are, in general, consistent with the findings in Table 6.

In addition, the concentration index that is reported at the bottom of the table computes the quality of journals. Unlike the relative index of publication concentration mentioned above, the concentration index for each journal shows the percentage of research that was published by top-tier institutions, and hence the remainder stands for how many publication slots remain for lower-ranked institutions (Klemkosky and Tuttle 1977). That is, the higher the concentration index, the higher would be the quality of the journal. This type of quality index is similar to the 'impact factor' that is most commonly used in the literature to compute the quality of journals (Laband and Piette 1994a). The difference between the two quality measures is that the impact factors use the citation index and hence the citation impact factor index identifies the gap between high and low quality journals as big, while the concentration index identifies the gap as smaller.

To compute the concentration index, we first add up total number of pages available for publication in each journal over the entire sample period 1973–2008. Second, we compute total pages published by top-30 institutions only. In this case, scholars from top-30 institutions are regarded as higher quality researchers. There are thousands of authors from more than 800 institutions in total, but labor market competitions ensure that higher quality researchers, on average, get hired by higher quality institutions, and hence quality papers tend to get concentrated in higher-ranked institutions (Borokhovich et al. 1995). Thus, the proportion of publications by top-30 institutions is computed for each journal as its own concentration index. As expected, the quality of three core journals is found to be similar to each other; but if firmly ranked, it would be the order of JREFE, REE, and JRER.



## Concluding Remarks

This paper has ranked universities and research institutions worldwide based upon page counts of articles published in three major real estate journals. The page counts were employed to capture many variations in the length of articles. For each author, his/her most recent affiliation was used to evaluate the school competitiveness of current faculty members rather than a perceived school reputation of the past. The main findings are summarized as follows. First, top-tier schools in the ranking of real estate research are not necessarily the most famous schools in economics or finance. Some renowned universities such as MIT, Yale, Harvard, Cambridge, among others, publish less in the field of real estate. This suggests that small but progressive universities can specialize in one or two sub-fields, based upon comparative advantages in their specialty areas. Otherwise, it will be extremely difficult to compete with big schools in all subjects.

Second, school competitiveness has been changed substantially in the United States. The changes found here are mainly due to a mobility of research-active scholars. For example, during the past decade, a number of fine research scholars have been increasingly appreciated at the job market and moved to better known universities locally or overseas. Florida State University and National University of Singapore are good examples. In contrast, European universities are less competitive, and university rankings are seldom shaken up. Third, the hall of fame in real estate research ranks individual scholars based on the stock of their life-time publications and further confirms that the mobility of research-active scholars changes school rankings considerably. Fourth, the sensitivity test that ranks institutions using a varied selection of journals suggests that top-tier schools are, in general, less sensitive to journal selections, while variations are relatively wide in lower ranks. The results are further supported by computing the relative index of publication concentrations for each institution. The concentration index also ranks an approximate journal quality.

Finally, the university rankings in this specialized field of real estate research should not be generalized to the ranking of the whole economics or finance departments or to a comprehensive university ranking. It should also be noted that the ranking procedure based solely on page counts reaches its limits. Like Nobel laureates, the impact of their scientific achievements in their fields might be more important than the volume of their publications. Quality-adjusted ranking is a subject for further research.

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