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RANKING AND EXPLAINING THE SCHOLARLY IMPACT OF LAW SCHOOLS

THEODORE EISENBERG and MARTIN T. WELLS*

ABSTRACT

This article measures 32 law schools' academic reputations by citations to their faculties' works. Yale, Chicago, Harvard, and Stanford rank alone at the top. Seven or eight schools compose the next group. We also explore the relation between scholarly impact and entry-level or lateral hire status, gender, minority status, subjects taught, and years in teaching. Lateral hires systematically outperform entry-level hires. We find no substantial evidence of male-female differences. We find some evidence of lower citations for minority females, but this difference is largely attributable to those in teaching fewer than 8 years. For faculty members in teaching more than 7 years, we find no significant minority effects but find marginal evidence that minority professors are more likely to be in the bottom quartile of citations. Controlling for different numbers of years in teaching is necessary to meaningfully compare groups.

I. INTRODUCTION

RANKING is in the air. Popular magazines, academic panels, and student-run journals rank academic departments, including law schools.¹ Faculties

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¹ Kenneth A. Borokhovich *et al.*, *Finance Research Productivity and Influence*, 50 J. Fin. 1691 (1995); Michael E. Conroy *et al.*, *The Productivity of Economics Departments in the U.S.: Publications in the Core Journals*, 33 J. Econ. Lit. 1966 (1995); Charles J. Corrado & Stephen P. Ferril, *Journal Influence on the Design of Finance Doctoral Education*, 52 J. Fin. 2091 (1997); Colleen M. Cullen & S. Randall Kalberg, *Chicago-Kent Law Review Faculty Scholarship Survey*, 70 Chi.-Kent L. Rev. 1445 (1995); James Lindgren & Daniel Seltzer, *The Most Prolific Law Professors and Faculties*, 71 Chi.-Kent L. Rev. 781 (1996); National Research Council, *Research-Doctorate Programs in the United States: Continuity and Change* (1995); David A. Pendlebury, *Which Psychology Papers, Places, and People Have Made a Mark?* 9 APS Observer 14 (January 1996); Richard A. Wright & Ellen G. Cohn, *The Most-Cited Scholars in Criminal Justice Textbooks, 1989–1993*, 24 J. Crim. Just. 459 (1996); *Law Schools*, U.S. News & World Rep., March 18, 1996, at 82; Symposium on Trends in Legal Citations and Scholarship, 71 Chi.-Kent L. Rev. 743 (Fred R. Shapiro & Jean Stenfancic

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confer about the import and desirability of rankings. Admissions offices ponder how to make schools appear more selective without overly distorting the admissions process. Law schools invoke studies in which they rank highly.² Some schools simply cheat in an effort to rank highly.³ A backlash against existing ranking techniques, some of it warranted, has already set in.⁴

Reasonably done rankings should convey useful information. Students, faculty, staff, and administrators must choose among schools. Many factors influence these choices, including locale, friends and family, cost, and quality. For law schools with a serious commitment to research, the faculty's academic reputation is an important measure of its quality.

This article measures 32 top law schools' academic reputations by assessing the degree to which the major consumers of legal scholarship, legal academics, use the schools' scholarly output. It thus assesses not what scholars say about schools' academic reputations but what they in fact do with schools' output. We measure what academics do by the number of times they cite scholarly works.

Substantial differences exist in the rate at which law schools' scholarly output is used. Four schools, Yale University, University of Chicago, Harvard University, and Stanford University, rank at the top. Within this group, Yale and Chicago outperform Harvard and Stanford. No other law school can plausibly claim to have the scholarly impact of these four schools or to be in the same group with them. Three law schools—Columbia University, Cornell University, and University of Michigan—make up a next possible grouping. But the difference between these three and several other schools—University of California, Berkeley; Northwestern University; New York University (NYU); University of Virginia; and perhaps University of Pennsylvania—is small, much smaller than the difference between the second group of three and the highest-ranked four schools. A third

eds. 1996); Terry L. Zivney & William J. Bertin, *Publish or Perish: What the Competition Is Really Doing*, 47 J. Fin. 295 (1992).

² Mark Tushnet, *An Expanded Community of Scholars*, Geo. Law, Fall 1995, at 3; Mason's Faculty Is Making Its Mark on the Academic World, George Mason University School of Law 1998 Prospectus, at 10 (citing draft of this study).

³ U.S. News & World Report, *supra* note 1, at 81.

⁴ Jerry L. Anderson, *Ranking Isn't Everything*, 83 A.B.A. J. 112 (March 1997); Peter Applebone, *Fighting the Rankings of a College Guide*, N.Y. Times, January 5, 1997, Educ. Life, § 4A, at 16; Arthur Austin, *The Reliability of Citation Counts in Judgments on Promotion, Tenure, and Status*, 35 Ariz. L. Rev. 829 (1993); Christopher A. Francese, *Rancorous College Rankings*, Wall St. J., December 19, 1996, at A22; Stephen Glass, *The College Rankings Scam*, Rolling Stone, October 16, 1997, at 93; Brendan A. Maher, *The NRC's Report on Research Doctorate Programs: Its Uses and Misuses*, Change, November 21, 1996, at 54.

group of schools with less impact than the second group consists of Cardozo Law School; University of Colorado; Duke University; Emory University; Georgetown University; University of Illinois; University of Indiana; University of Iowa; University of Minnesota; University of California, Los Angeles (UCLA); University of Southern California (USC); University of Texas; and Vanderbilt University, with George Washington University also plausibly includable in this group.

Although we report school ranks, collecting schools into groups with similar impact is more meaningful. Ranking without identifying the spacing between institutions can be misleading. Movement of one or two professors to or from a school or a change in methodology could easily change the rankings. Slight but insignificant changes in rankings should not be a cause for alarm on the part of schools or their applicants.⁵ Groupings, in contrast to rankings, are more robust to small changes in personnel or methodology. We would not expect a school to change groups except over the long term. Rank within a group is more volatile and for many purposes would be better ignored.

We also seek to explain the observed pattern of scholarly impact. The factors we study include entry-level compared with lateral status, gender, minority status, subjects taught, and years in teaching. Scholarly impact depends on the area of law in which one labors. Writing about constitutional law offers the opportunity for the greatest impact on other scholars, probably because the most people teach and write in this area and because student law reviews may be especially amenable to articles about constitutional law.

Schools differ in the extent to which they rely on lateral hiring and in the relative performance of entry-level and lateral hires. Even controlling for years of teaching, lateral hires systematically outperform entry-level hires. Yale's high place in the rankings is attributable to a high rate of lateral hires with significant scholarly impact. But the pattern of entry-level and lateral differences varies among schools. Chicago's faculty does not include a high proportion of lateral hires, yet it ranks very highly. And, surprisingly, at some schools entry-level hires outperform lateral hires.

We find no substantial evidence of differences in the rates at which males and females are cited. Initial differences fade when one accounts for years in teaching, and significant differences are limited to those in teaching

⁵ But see Glass, *supra* note 4, at 94 (describing an expected 5 percent drop in applications and 10 percent drop in high school student visits because Yale University dropped from first to third in *U.S. News & World Report's* rankings); Jane Stancill, UNC Law School Battles a Slump, *News & Observer* (Raleigh, N.C.), May 8, 1997, document no. 1997 WL 7834330 (discussing concerns over decline in the University of North Carolina's Law School ranking in *U.S. News & World Report*).

fewer than 8 years. We find some evidence of lower mean citations based on female minority status, but this difference is largely a function of differences for those in teaching fewer than 8 years. We also find some marginally significant evidence that minority professors are more likely to be in the bottom quartile of citations.

The data also suggest a time trend that is important to consider when comparing groups, such as males and females, with substantially different years of teaching experience. References to one's work peak at about 15–20 years into one's career. After that, citations level off.

As with any ranking system, the system developed here can be misused. The system is not a method for perfectly selecting leading legal scholars. Someone who ranks low in this system may well be an excellent scholar laboring in a field that does not generate many citations in the database we use. Or their scholarly impact may not be measurable through a simple count of citations. And someone who ranks highly may be producing large amounts of citable but weak scholarship. In ranking entire schools rather than individuals, however, we would not expect these features to be overly distorting.

Section II describes the study's methodology. Section III reports the ranking and grouping of schools. Section IV explores sources of difference in scholarly impact.

II. METHODOLOGY

Scholarly impact is related to but distinguishable from two other bases for ranking: quantity and quality of publications. Quantity measures output. Quality assesses merit. Impact can account for both. A school's faculty cannot have substantial impact if it lacks substantial scholarly production. Holding productivity constant, a faculty is likely to have higher scholarly impact than other schools if its output is of higher quality.⁶

⁶ There are limits on how satisfactorily one can measure either quality or quantity. With respect to any specific scholarly work, there may not be a consensus about its quality. If we allow gradations of quality, there almost certainly will be disagreement. Quantity, more objectively measurable than quality, also is not self-defining. Should one count articles published or pages published? Counting articles gives the same credit to a 10-page article as to a 50-page article. Some 10-page articles, though few even exist in law reviews and almost no 10-page work would be marketed as an article, may be better than some 50-page articles. But the author of a 50-page article is, by one measure, more productive than the author of a 10-page article. Counting pages instead of articles raises the problem of rewarding wordiness rather than useful production. And how should we account for books? Is one book worth three articles? Surely it is more acceptable to treat each book on its own in assessing quantity. One can overstate the objections to measuring both quality and quantity. Although scholars may not agree on which articles are best or worst, few would assert that all articles are equal. A survey asking scholars to assess several articles would be unlikely to produce random results. The existence of different plausible measures of productivity—pages and articles, for

Measuring impact requires an index or measure that reasonably correlates with impact. We use on-line citations to faculty members as our index. Using them to assess impact requires a source of citations, a set of scholars to study, and a search methodology.

A. *What We Measure*

Counting the number of documents in which a scholar's name appears in on-line sources provides a measure of how often others invoke his or her work or thoughts. One whose works are cited more often has, by one measure, more impact. Monitoring reliance on a scholar's work also helps measure quality. One usually does not cite works not worth mentioning. One can fuss about whether scholarly impact is positive or negative, but the impact is undeniable. And a cottage industry has emerged describing the non-meritorious reasons why works might be cited.⁷ Across many articles and scholars, however, the most often cited articles tend to be regarded as those with the highest quality. This is not to say that every widely cited article is superior to every article less frequently cited. For the purpose of ranking schools, it is only necessary that citation frequency correlates with objective quality, not that it perfectly reflects quality. Appearing on lists of the most-cited articles is rarely viewed as damning of one's work.

Another measure of impact is a school's scholarly reputation as measured by surveys. Surveys have obvious weaknesses, but in general, one would expect a high correlation between survey results and scholars' actual use of schools' output. To the extent the two measures differ, comparing them should be illuminating.

B. *Data Source*

Quantitatively assessing scholarly impact requires a data source that accounts for a large volume of scholarly output that can also be systematically

example—does not mean that neither measure is valid. In fact, one expects them to be highly correlated. Scholars who produce the most articles tend to produce the most pages. Cullen and Kalberg show a high, but not perfect, correlation between ranking schools by pages and ranking schools by the number of articles published in leading law reviews. They also show that, in ranking a school's productivity, it may not matter which measure is chosen. And since most of legal academia's scholarly output is in the form of articles, it may not overly skew results, in comparing schools' output, to ignore books, as has been done. See Cullen & Kalberg, *supra* note 1.

⁷ J. M. Balkin & Sanford Levinson, How to Win Cites and Influence People, 71 Chi.-Kent L. Rev. 843 (1996); R. H. Coase, The Problem of Social Cost: The Citations, 71 Chi.-Kent L. Rev. 809, 811–12 (1996); Richard Delgado, The Colonial Scholar: Do Outside Authors Replicate the Citation Practices of the Insiders, But in Reverse? 71 Chi.-Kent L. Rev. 969 (1996); William M. Landes & Richard A. Posner, Heavily Cited Articles in Law, 71 Chi.-Kent L. Rev. 825, 826–27 (1996); Nancy Levit, Defining Cutting Edge Scholarship: Femi-

searched at the individual faculty member level. West Publishing's Westlaw Texts and Periodicals database, referred to on-line as "tp-all," contains works from hundreds of journals and other sources dating back to the 1980s. The kinds of documents include law reviews, texts, continuing legal education materials, bar journals, and practice-oriented periodicals.⁸ The tp-all database does not necessarily include every article from each of its sources. For many leading law reviews, however, tp-all contains full coverage for several years. Westlaw's "scope" command describes tp-all's coverage as follows, "Full coverage is available for many of these periodicals; however, to enhance the research potentiality of the database, coverage of most periodicals is limited to those selected works that present pragmatic discourses on legal issues of national interest." A single-spaced listing of the sources available in the tp-all database, as of October 4, 1995, occupies a bit under 13 single-spaced pages, or approximately 550 journals or other sources.⁹ Our own tests show it to be more comprehensive than the most comparable Lexis database. And the Social Science Citations Index contains many fewer law reviews.¹⁰ West Publishing often updates tp-all both through additional publications by sources already in the database and through the addition of new sources.¹¹

C. Which Faculty Members and Schools?

Not all faculty members' primary responsibilities include regular scholarly production. Law school faculties have become more specialized since the advent of clinical legal education. Many clinicians engage in the day-to-day supervision of students and in the conduct of litigation. Their job requirements at many schools do not include the regular production of scholarship. Assessing scholarly impact could include these clinicians and simply count them, as a group, as scholars with little impact. But it seems

nism and Criteria of Rationality, 71 Chi.-Kent L. Rev. 947, 950-52 (1996); Fred R. Shapiro, The Most-Cited Law Review Articles Revisited, 71 Chi.-Kent L. Rev. 751, 754 (1996).

⁸ Westlaw's "scope" command reports the general categories of documents in tp-all. "The TP-ALL database contains documents from law reviews, texts, CLE [continuing legal education] course materials, bar journals and legal practice-oriented periodicals" (response to Westlaw scope command, October 4, 1995).

⁹ *Id.*

¹⁰ Lindgren and Seltzer report that the Social Science Citation Index counts citations to about 95 law reviews but excludes a substantial number of standard law reviews. Lindgren & Seltzer, *supra* note 1, at 786.

¹¹ From October 4, 1995, to June 16, 1996, the number of single-spaced, 10 point, courier font pages, with 1-inch margins needed to list the periodicals in tp-all grew from 13 to 17 single-spaced pages.

more appropriate to treat clinicians as not being expected to regularly produce scholarship.

We thus limit the population of professors studied to those tenured and tenure-track faculty members whose full-time job requires the production of scholarship.¹² This principle has implications for groups other than clinicians. Under this principle, adjunct professors are excluded because their primary job is almost always more or solely oriented toward teaching. In a similar manner, administrators, legal writing instructors, librarians, and deans (one per school, but not associate deans who are faculty members) are not included in the study.

Subject to the above exclusions, the faculty members searched for, at each school, consist of those appearing in the Association of American Law Schools (AALS) directory for the 1993–94 academic year. Since the searches were conducted in late 1995 and early 1996, all faculty members included in this study have been in teaching at least 2 years. We further control for length of time in teaching by limiting some results to those with more than 7 years of teaching experience and by stating many results in terms of time-adjusted citations. We do not account for post-1994 movement of faculty members.

One must decide which schools to include in the study. We include all schools that *U.S. News & World Report's* 1996 ranking of law schools lists as being in the top 20 in academic reputation. Our selection of the 12 additional schools is eclectic. Most were chosen because we thought they were reasonable candidates for top 20 inclusion. George Mason University is included because of its distinctive approach to legal education. We are confident that nearly all reasonable candidates for top 20 status are included. But we have not systematically identified the top 32 schools. Some schools not included in this study probably would outrank schools near the bottom of our rankings. Failure to include a school is not evidence that it ranks below the included schools. We simply had to stop including schools at some point.

D. *The Search Query and Its Implications*

Having settled on the population of schools, faculty members within schools, and on a data source, one needs an on-line search strategy. Our basic search algorithm is, within the tp-all database, to enter the following query for each faculty member at each school in the study: “first name

¹² For similar exclusions, see Borokhovich *et al.*, *supra* note 1, at 1695 (excluding deans and administrators); Deborah Jones Merritt & Barbara F. Raskin, Sex, Race, and Credentials: The Truth about Affirmative Action in Law Faculty Hiring, 97 Colum. L. Rev. 199, 209–10 (1997).

w/2 last name''. Westlaw responds to the query by reporting the number of documents in tp-all in which the search term appears. This response is the number used in this study.

Understanding this study, and its limitations, requires understanding what the number of documents reported in a Westlaw search represents. According to Westlaw's scope command for the tp-all database, "A document is an article, a note, a symposium contribution, a product review, or other materials published in one of the available periodicals, or a section from one of the available texts." Thus, for example, if a search consisting of "John w/2 Doe" returns the number 50, then the tp-all database contains 50 documents that contain the name "John Doe."

The Westlaw definition of document and the search query used can lead to overcounting or undercounting a professor's scholarly impact. Where possible and practical, we adjust the search query and counting method to minimize these problems. To the extent such adjustment is not possible, we must assume that the problems of overinclusion and underinclusion do not substantially differ across schools.

Sources of Overinclusion. One issue of concern is that the search may return false positives. If more than one person named John Doe appears in tp-all, then the John Doe of interest may incorrectly be credited with having his name appear in more documents than he should. The problem arises mostly for people with common names and for people with names similar to names of historical figures who may be the subject of articles in tp-all. For example, the name "John Marshall" will return many more documents than those in which Professor John Marshall's name appears because the "w/2" search also counts all documents in which Chief Justice John Marshall's name appears.

We deal with false positives by sampling the documents returned by the Westlaw search. For professors with common names, historically important names, or with a surprisingly high number of documents satisfying the basic w/2 search term, we examine the first 10 or 20 documents satisfying the w/2 search. We examine enough of each document to ascertain whether the document counts as a false positive. After examining the 10 or 20 sample documents, we multiply the total number of documents satisfying the w/2 search by the proportion of sampled documents that are not false positives.

For example, assume that John Doe is a common name that is ripe for sampling. The w/2 search reports 50 documents containing John Doe. We examine the first 20 documents and find that 12 of them are false positives. The nonfalse-to-positive rate for the sampled documents is 8/20, or .40. We multiply 50 by .40 to arrive at 20, John Doe's number of citations for purposes of analysis.

A concern raised by Westlaw's definition of a document stems from its

inclusion of "a section from one of the available [on-line] texts" as a response to the scope command. If a professor authors a treatise that is available on-line via Westlaw, Westlaw counts every section of the treatise as a document in which the professor's name appears. We reviewed the list of on-line treatises and conducted searches to exclude documents that satisfy the w/2 search merely because the document was a section in an on-line treatise.

For example, a leading on-line, and off-line, treatise is Charles A. Wright and Arthur R. Miller's *Federal Practice and Procedure*.¹³ If one runs the w/2 search using one of the authors' names, Westlaw reports that several thousand documents satisfy the search criteria. In fact, the vast bulk of documents Westlaw reports consists of the on-line sections of the treatise or its on-line supplement and not documents in which other parties cite to the treatise. Thus, in using the w/2 search for professors with on-line treatises, we add a restriction that the document satisfying the search term not be the on-line treatise or the on-line supplement to the treatise.

Sometimes professors' names appear in a document for reasons unrelated to the content of their work. For example, one's name may appear in the acknowledgment note that appears in many articles. This thank-you may reflect hours of intensive labor in reviewing a colleague's draft or a polite colleague who sees little cost in adding a name to the first footnote. Documents in which one's name appears only as an acknowledgement are included in a professor's count for two reasons. First, eliminating those documents would impose high costs on the study; every document would have to be scrutinized to determine whether appearance of the professor's name is merely an acknowledgment. Second, including the acknowledgment citations allows one to give credit to those colleagues who may not produce much on their own but who are valuable to others' scholarly work.

Sources of Underinclusion. The methodology employed has two separable sources of underinclusion, which we will call "substantive" and "technical." "Substantive" underinclusion stems from Westlaw not including as documents many kinds of scholarly endeavors. "Technical" underinclusion stems from search methodology and citation form.

With respect to substantive underinclusion, interdisciplinary faculty members raise an important issue. Professors with degrees in both law and another discipline or with degrees only in another discipline may have their greatest impact in the journals and books of the nonlaw discipline. One can define the problem away by stating that citations in such journals do not reflect legal scholarly impact. But this is not fully satisfactory. Law faculty

¹³ Charles A. Wright & Arthur R. Miller, *Federal Practice and Procedure* (1997).

members with substantial influence in other law-related fields do not self-evidently have less scholarly impact than faculty members whose impact is limited to legal academic outlets. For example, some interdisciplinary law faculty members are frequently cited in the criminal justice literature and will not receive similar credit in this study unless they are also frequently cited in documents appearing in tp-all.¹⁴

A few factors ameliorate this problem. First, the vast majority of law faculty publications are not in other disciplines' journals. Second, interdisciplinary scholars exist at most good law schools so that, in measuring schools' impact and not individuals' impact, this issue should not substantially skew results. Third, if an interdisciplinary scholar's work is highly successful, it should be cited in publications that appear in Westlaw. Since we measure impact and not productivity, the publication in which a scholar's work appears is not critical to its success under our standard. What is critical is that others decide to cite the scholar's work. We include interdisciplinary professors on the ground that they are expected to produce scholarship and that some of that scholarship should be trying to influence purely legal scholars.¹⁵ Nevertheless, schools with a substantial number of interdisciplinary faculty members whose primary law-related publication outlets are not represented in tp-all may suffer in the system used here.

The development of electronic publication raises a further question. Some schools have impact through electronic sources other than Westlaw. Some professors' publications may be published only or primarily on-line through World Wide Web sites¹⁶ or on CD-ROM.¹⁷ These publications may reach hundreds or thousands of users a week, potentially dwarfing all other methods of disseminating legal information and scholarship.¹⁸ This study

¹⁴ Wright & Cohn, *supra* note 1.

¹⁵ Economists are probably the most common interdisciplinary category of professors. In addition to containing the traditional law reviews in which many law and economics professors publish, Westlaw also contains journals oriented toward economists, including the following: *Industrial and Labor Relations Review*, *International Review of Law and Economics*, *Journal of Law and Economics*, *Journal of Law, Economics and Organization*, *Journal of Legal Studies*, *Stanford Journal of Law, Business and Finance*, and *University of Miami Business Law Journal*.

¹⁶ For example, Peter W. Martin, What Do Law Students with Laptops and Electronic Casebooks Do? The Chicago-Kent Computer Section (1995-96) (Internet version October 15, 1996, available at <http://www.law.cornell.edu>). For Internet sources with substantial information about the legal system, see <http://www.law.cornell.edu>; <http://teddy.law.cornell.edu:8090/questata.htm>.

¹⁷ Peter W. Martin, Martin on Social Security, in *Social Security Plus* CD-ROM, December 1997. *Social Security Plus* is part of what its publisher, Clark Boardman Callaghan, describes as "an Integrated Electronic Practice System."

¹⁸ For example, Martin, note 17 *supra*, is used by the Social Security Administration itself.

does not account for on-line publications and dissemination through web sites.

The interdisciplinary and on-line professors are but two important instances of the limited substantive content of Westlaw. Other sources include those who invest time in producing outputs not well reflected in Westlaw. Examples quickly gleaned from Cornell faculty efforts include American Law Institute restatements, legal history projects, publications in foreign languages or addressed to foreign audiences, efforts to influence or shape a field of law through casebooks, and reports to or for the profession. Other strong schools may have different unmeasured outputs. This study depends on the collection of unmeasured outputs either not being systematically different across schools or not being large enough to dwarf the results from scholarly output picked up by Westlaw.

Technical sources of underinclusion result from the nuances of Westlaw and citation forms. Just as some professors might receive credit for having scholarly impact when they should not, some will not receive credit for having impact when they should receive it. The reasons for underinclusion, in addition to those with respect to the interdisciplinary and other professors noted above, are related to the structure of names and to the methods of citation.

A few professors publish under names that are too long to be detected by the w/2 search. For example, the w/2 search would fail to detect citations to "John A. B. Doe" though it would detect citations to "John A. Doe." For professors who use names that would elude the w/2 search, we changed the w/2 restriction to "w/3." Some professors may publish under names other than those appearing in the AALS directory or nicknames. We did not attempt to search for citations to names other than those in the directory.

A journal's citation form can result in failure to count citations to one's work. The w/2 and w/3 searches are not practicable tools if one cannot use an author's first name as part of the search. Searching by last name only or by first initial and last name would require verifying by individual document inspection too many documents to be practicable. Yet many journals' historical citation format required citation only to an author's last name or, in the case of books, to an author's first initial and last name.

But the dominant form of citation changed several years ago. The influential *Bluebook: A Uniform System of Citation* has required use of first and last names since the fifteenth edition, published in 1991.¹⁹ So the bulk of the stock of documents on Westlaw in recent years includes authors' last

¹⁹ Compare *The Bluebook: A Uniform System of Citation*, rules 15.1.1, 16.1 (Columbia Law Review *et al.* eds., 15th ed. 1991), with *The Bluebook: A Uniform System of Citation*, rules 15.1, 16.1 (Columbia Law Review *et al.* eds., 14th ed. 1986).

and first names. Those who tended to publish in journals that employed full names before the *Bluebook* required citation by full names will have an advantage.²⁰ So one should think of this study as systematically measuring "current" scholarly impact, with current meaning approximately since 1991.

Some residual problems remain for multiauthored works. If the citation to one's work is in sufficiently old sources, the citations will not be counted at all because the citing document will not be in the tp-all database. If the citation form used in a journal does not require citation of each author's full name, then second-listed and later-listed authors of works will be undercounted.²¹ This unfortunate citation form is mandated by the *Bluebook* for works with more than two authors.²²

Adjusting for Changes in the Database over Time. The tp-all database's increasing size over time and the search methodology used raise an issue about the compatibility of search results across schools. It is logistically difficult to search for all professors at all 32 schools studied on the same day. In fact, the searches spanned a period of a few months in late 1995 and early 1996. By the time we searched for the last school's faculty, however, the tp-all database undoubtedly was larger than when we searched for the first school's faculty. Professors at schools whose faculty members were searched for later in time could receive higher impact ratings merely because they were searched for later and not because they actually had greater scholarly impact.

Assuring interschool comparability thus requires accounting for growth in the tp-all database. One possible technique is to restrict all searches to a common ending date. A date-restricted search, however, will not account for the fact that documents may be added to tp-all at a date subsequent to the date restriction and still be counted as documents in the search.²³ This

²⁰ Thus, those authors publishing in journals using the "Maroon Book," The University of Chicago Manual of Legal Citation (University of Chicago Law Review & University of Chicago Legal Forum eds. 1989), will be favored by our system because the Maroon Book has required citations to full names since 1989, while the *Bluebook* has required such citations only since 1991.

²¹ And, as in any computer-based search, spelling of one's name is crucial, and documents using informal nicknames will not be detected.

²² *Bluebook* (15th ed.), *supra* note 19, rule 15.1.1. This rule has been both protested and breached. See James W. Paulsen, An Uninformed System of Citation, 105 Harv. L. Rev. 1780, 1793 & n.87 (1992), reviewing the *Bluebook*.

²³ For example, suppose one restricts all searches by limiting them with a "before January 1, 1996" date restriction. A search conducted on February 1, 1996, may return fewer documents than a search on March 1, 1996, with the same date restriction. Any documents added to tp-all between February 1 and March 1 that bear a document date earlier than January 1, 1996, will show up in the March search but not in the February search. Dates in Westlaw

means that the same search with the same date restriction but conducted on different days can yield different results.

An alternative technique is to construct an index that roughly measures the growing size of the tp-all database. To construct such an index, we used citations to two frequently cited authors, Richard Posner and Laurence Tribe. Works by these authors are frequently cited, and increases in the size of tp-all should be reflected in increased citations to both authors. Therefore, at the beginning of each search session, we searched for "Richard w/2 Posner" and "Laurence w/2 Tribe." We added the results of these two searches to construct a Posner-Tribe index. All citations reported here are adjusted to reflect this index. This provides some adjustment for the different days on which different schools' faculty members were searched for. The index also allowed us to correct mistakes, introduced through typographical or other errors, by searching affected faculty members at a later date and using the index to deflate their citations to enhance comparability with earlier searches. Use of the index does not materially affect the results reported here.

E. Comments on the Methodology

Having identified some of our methodology's limitations, we note some of its appealing features. First, as noted above, our techniques measure whether others use one's work, not just whether one is producing a large volume of work. Second, our methods are replicable, and the data source used is widely available. Anyone wishing to rank a school or schools ought to be able to do so using similar methodology.

Third, the methodology allows one to receive credit for works not contained in the tp-all database. If one writes an influential book or article that is not included in tp-all, one receives credit for that work if a document within the database cites the work using the author's first and last name. We make no arbitrary choices of the top 10 or 20 journals with the unfortunate result that work not appearing in those journals is not counted at all.²⁴

Fourth, the nature of Westlaw's output precludes self-citation from enhancing one's performance in this study. Westlaw counts documents in which a search term appears, not the number of citations to a search term within a document. For example, assume John Doe publishes an article that is reproduced in tp-all. In addition, assume that John Doe cites 10 of his

are the dates borne by the document, not the dates that documents are added to Westlaw. The later-searched faculty members would again enjoy an advantage.

²⁴ We suspect that Stanford's, Michigan's, and NYU's surprisingly low rankings in the Chicago-Kent productivity study stem from that study's limitation to a small number of law reviews. See Table 4.

own prior works in that same article. The w/2 search will count the article as one document satisfying the search query. The fact that the article also contains 10 references to John Doe's other works will not change this result; the document counts as one document.

Our methodology also responds in part to each of the four concerns William M. Landes and Posner voiced about Fred Shapiro's citation study. Their concerns were as follows: "The first is the ranking of individual articles rather than scholars; the second is the failure to take account of differences among articles in their age or time since publication; the third is the exclusion of books; and the fourth is the exclusion of articles more than half the citations to which appear in nonlegal journals."²⁵ We use scholars, not individual articles, to assess schools' performances. We include in some of the rankings time-based criteria. Our methodology, as discussed, includes books, and we do not arbitrarily exclude articles based on their publisher.

A residual effect of Westlaw's document-based counting is that the w/2 search, standing alone, cannot account for multiple citations to one's work in a single document authored by others. For example, compare the above John Doe article, containing 10 instances of self-citation, with an article in which someone other than John Doe makes 10 references to John Doe. The article not authored by John Doe is counted by Westlaw as one document satisfying the w/2 search term, not 10. In addition, the study does not account for the quality of the journal in which one's work is cited.

Most concerns about the database and search strategy likely diminish in assessing schools and relative scholarly impact in contrast to individuals or absolute levels of scholarly impact. Given the limitations of the tp-all database, one should regard the numbers reported below as indices of performance and not regard them as measuring absolute levels of performance.

III. RANKING AND GROUPING LAW SCHOOLS

For each faculty member, the w/2 search reports the number of documents in which the faculty member's name appears. For each school, we compute the mean number of documents citing the school's faculty per faculty member and the median number of citations for the faculty. We use these means and medians to rank the schools.

Both the mean and median are useful measures of a school's scholarly impact. Limiting the ranking system to means would benefit schools with a small group of high-impact scholars. Limiting the ranking system to medians would ignore the fact that scholars above the median can vary widely in their influence. Combining the two measures allows schools to receive

²⁵ Landes & Posner, *supra* note 7, at 825.

credit for their superstars without neglecting the import of the faculty as a whole.

A. *Ranking and Grouping*

Table 1 presents the mean and median scores for each faculty, the sum of the mean and median scores, and the ranking of the school based on that sum. It presents results both for the entire faculty and for faculty members with more than 7 years of teaching experience. The 7-years restriction should effectively restrict the results to only permanent, tenured faculty members. It eliminates those who may dabble in teaching but decide that it is not the profession for them or who do not perform up to their school's long-term standards.

Looking solely at the "full faculty" columns in Table 1, one could argue that Yale is alone at the top. Its extraordinary median drives the sum of its mean and median to a level well above that of any other school. But Chicago ranks higher based on the mean and outperforms Yale for faculty in teaching more than 7 years.²⁶ Whichever measure is used, there is a noticeable gap between Yale, Chicago and the next two schools, Stanford and Harvard. Little difference exists between Stanford and Harvard.

Regardless of measure, another large gap exists between Stanford and Harvard and any other school. The data support a grouping of four top schools. Defining a "top five" requires imposing a more arbitrary cutoff.

In the next group, Cornell, Columbia, and Michigan are almost indistinguishable. Columbia and Michigan trade places depending on whether one uses the full faculty or faculty in teaching more than 7 years. Using either method, Cornell is between Columbia and Michigan. Using the sum-of-means-and-medians criteria, a noticeable but not very large gap exists between the Cornell, Columbia, and Michigan group and a next group of four schools, NYU, Virginia, Berkeley, and Northwestern. If one limits the sample to faculty with more than 7 years of teaching experience, Pennsylvania could plausibly be added to this group. So, depending on one's criteria, there are either four or five schools in the third-highest group. If one were forced to pick the "top 10" schools, one could respectably stop after the 11 or 12 schools in the top three groups.

Since the rankings vary based on the ranking criteria, it is natural to ask the extent to which the rankings would change if other criteria were used. For example, adding the mean and median could be viewed as giving undue

²⁶ Although Easterbrook and Posner continue to teach regular courses at Chicago, the selection criteria used exclude Easterbrook and Posner from the Chicago faculty since they were full-time judges in 1993-94. Including them would lead to Chicago ranking first by a wide margin.

TABLE 1
LAW SCHOOL RANKING BY SCHOLARLY IMPACT

	FULL FACULTY			FACULTY TEACHING MORE THAN 7 YEARS			SCHOOL RANK		
	Sum	Mean	Median	Sum	Mean	Median	Full Faculty	Faculty Teaching More than 7 Years	AVERAGE RANK
Yale	713.4	378.5	334.9	739.3	383.8	355.5	1	2	1.5
Chicago	577.4	412.5	164.8	940.7	546.6	394.1	2	1	1.5
Stanford	517.6	310.0	207.6	601.1	354.3	246.8	3	3	3.0
Harvard	516.0	348.3	167.7	591.0	396.5	194.4	4	4	4.0
Columbia	343.6	206.0	137.5	354.9	210.0	144.9	5	7	6.0
Cornell	327.7	188.8	139.0	376.8	222.5	154.3	6	6	6.0
Michigan	318.8	194.1	124.7	395.7	218.1	177.5	7	5	6.0
NYU	292.8	191.3	101.5	334.7	211.4	123.3	8	8	8.0
Virginia	281.2	146.2	135.0	315.0	165.6	149.4	9	10	9.5
Northwestern	265.3	166.9	98.4	321.3	184.6	136.7	11	9	10.0
Berkeley	274.2	164.4	109.8	293.6	174.0	119.6	10	11	10.5
Pennsylvania	233.4	145.3	88.1	290.6	169.2	121.4	12	12	12.0
UCLA	233.3	140.6	92.7	269.7	166.8	103.0	13	13	13.0
Illinois	229.3	137.7	91.6	259.0	157.2	101.7	14	14	14.0
Texas	223.6	137.9	85.7	251.2	155.0	96.2	15	15	15.0
Georgetown	217.0	149.6	67.4	236.8	161.1	75.7	16	17	16.5
USC	207.4	135.3	72.1	246.2	159.2	87.0	19	16	17.5
Duke	216.0	130.3	85.7	226.2	138.5	87.7	17	18	17.5
Minnesota	207.8	139.0	68.8	215.7	146.8	68.8	18	19	18.5
Colorado	182.9	132.4	50.4	199.8	142.3	57.5	20	21	20.5
Emory	165.5	88.2	77.2	202.5	102.2	100.3	21	20	20.5
Vanderbilt	158.0	88.6	69.3	165.6	92.3	73.3	22	23	22.5
Iowa	157.0	102.6	54.4	169.4	111.3	58.1	23	22	22.5
Indiana	151.8	80.4	71.4	154.0	82.6	71.4	24	24	24.0
Cardozo	140.3	77.1	63.2	142.4	79.2	63.2	25	26	25.5
George Washington	131.0	79.9	51.2	144.8	87.6	57.2	26	25	25.5
Chicago-Kent	118.9	66.9	52.1	120.6	69.5	51.1	27	28	27.5
Boston University	101.4	62.5	38.9	123.2	73.8	49.5	29	27	28.0
Wisconsin	108.8	72.7	36.1	115.7	76.8	39.0	28	29	28.5
George Mason	92.3	66.2	26.0	104.5	77.5	27.0	30	30	30.0
North Carolina	86.4	50.9	35.5	88.2	53.2	35.0	31	31	31.0
Washington, Seattle	75.9	48.9	27.0	83.9	53.4	30.5	32	32	32.0

SOURCES.—Westlaw tp-all database; Association of American Law Schools, The AALS Directory of Law Teachers, 1993–1994 (1993).

weight to the mean because it can be so more widely distributed than the median. One way to control for this effect is to reduce the means and medians to a common scale before combining them. We have tried this with no material effect on the results.

We also use cluster analysis to group the schools. The aim of cluster analysis is to classify objects into groups that are internally cohesive yet externally isolated.²⁷ An important output from the hierarchical agglomeration algorithm we use is the classification tree (see Figure 1). The diagram represents the entire clustering process graphically and enables one to see which objects and groups are merged at the various stages of the algorithm. In this tree diagram, the leaves represent the objects, and the numerical scale is a measure of the dissimilarity within the clusters. The magnitude of dissimilarity within a cluster is not important relative to the membership of the cluster itself. And the order of appearance of schools in the diagram is not a ranking; it is based on graphical considerations. The diagram portrays differences and dissimilarity of clusters, not ordinal rankings.

In performing the cluster analysis, we use four variables: citations per faculty member, citations per faculty member per year of teaching, median citations per faculty member, and median citations per faculty member per year of teaching. We cut off the grouping process at the level of five distinctive groupings. Table 2 reports a summary of the results of the cluster analysis, with groups in ranked order and schools listed alphabetically within groups.

The intergroup separation is more graphically depicted in the classification tree in Figure 1. The groups are naturally defined by the pruning of the classification tree. In Figure 1, one can see that the first group is quite different from the other groups, and within this group, Yale and Chicago are isolated from Harvard and Stanford. One can see that groups 2 and 3 separate from groups 4 and 5. Within group 2, Columbia, Cornell, and Michigan are isolated from the others. From Table 1, we see that Virginia is different from the others in group 2 in that it has a relatively high median and a low mean. The clustering algorithm finds this and isolates Virginia from the NYU, Northwestern, and Berkeley subgroup. The reader can inspect Figure 1 along with Table 1 to make further comparisons.

Cluster analysis thus largely confirms the groupings suggested by Table 1, though there are some differences. For example, our casual search for

²⁷ Brian S. Everitt, *Cluster Analysis* (3d ed. 1993); A. D. Gordon, *Classification: Methods for the Exploratory Analysis of Multivariate Data* (1981). The hierarchical agglomeration algorithm we use starts with each object in a group of its own. At each iteration it merges two groups to form a new group; the merger chosen is the one that leads to the smallest increase in the within-group sum of squares dissimilarity measure. The number of iterations is equal to the number of objects minus one, and at the end, all of the objects are together in a single group.

FIGURE 1.—Hierarchical cluster tree of law schools' scholarly impact on the basis of citations per faculty member, citations per faculty member per year of teaching, median citations per faculty member, and median citations per faculty member per year of teaching. Sources: Westlaw tp-all database; Association of American Law Schools, The AALS Directory of Law Teachers, 1993–1994 (1993).

TABLE 2
GROUPING OF SCHOOLS ON THE BASIS OF HIERARCHICAL CLUSTERING

-
1. Chicago, Harvard, Stanford, Yale
 2. Berkeley, Columbia, Cornell, Michigan, Northwestern, NYU, Virginia
 3. Colorado, Duke, Georgetown, Illinois, Minnesota, Pennsylvania, Texas, UCLA, USC
 4. Cardozo, Chicago-Kent, Emory, George Washington, Indiana, Iowa, Vanderbilt
 5. Boston University, George Mason, North Carolina, Washington, Wisconsin
-

SOURCES.—Westlaw tp-all database; Association of American Law Schools, The AALS Directory of Law Teachers, 1993–1994 (1993).

NOTE.—The spacing between group 1 and groups 2 and 3 indicates that the difference between group 1 and groups 2 and 3 is larger than the difference between group 2 and group 3. In a similar manner, the difference between group 3 and groups 4 and 5 is larger than the difference between group 4 and group 5.

groupings based on Table 1 permitted including Pennsylvania in group 2. This and other differences are probably explained by the slightly different criteria used for the hierarchical clustering than the criteria used in Table 1. In particular, the inputs into the hierarchical clustering-based rankings included mean citations per year of teaching and median citations per year of teaching as well as the simpler means and medians reported in Table 1.

Using the more traditional statistical approach, we also conduct tests in which we treat an initial group of schools as a unit and then analyze the effect of adding a specific school to that unit. We note that the cluster approach is preferred since there is no need to control for the possibility of the increased probability of making a type I error due to carrying out multiple hypothesis tests. Furthermore, the clustering takes the multivariate nature of the mean, median, mean per year of teaching variable, and median per year of teaching variable into account, whereas the more traditional analysis is only on the individual univariate means and medians.

To illustrate the more traditional approach, suppose one accepts that Chicago, Harvard, Stanford, and Yale are a group of similar schools as measured by their faculty members' citations. Using Kruskal-Wallis (for medians) and ANOVA (for means) tests, one can obtain a *p*-value for the hypothesis that these schools are from the same population. For these four schools, the *p*-values are .377 and .453, respectively. One can then observe the effect on the *p*-values of adding any other school to the group. A substantial drop in *p*-value is evidence that the candidate school does not belong in the group.

The *p*-values show substantial declines when one constructs a group of five schools by adding any other school to the group consisting of the top

four. One can reject the hypothesis that a group of five schools (the top four plus each candidate school for inclusion in the top four) has similar citation patterns at the level of at least $p = .08$ for the Kruskal-Wallis test of medians and at the level of $p = .16$ for the ANOVA test of means (logs). Only the inclusion of Columbia (Kruskal-Wallis $p = .08$; ANOVA $p = .16$) and Cornell (Kruskal-Wallis $p = .05$; ANOVA $p = .02$) cannot be rejected for both tests at $p \leq .05$.

Suppose one next accepts that Columbia, Cornell, and Michigan are a plausible unit against which to test the inclusion of other schools (other than the top four schools). Using Kruskal-Wallis and ANOVA tests, the p -values for the hypothesis that these schools are from the same population are .721 and .370, respectively. Several schools can be added as a fourth member of this group without p -values for the resulting group of four becoming small. On this basis, one could not reject the hypothesis that Berkeley, Northwestern, Pennsylvania, UCLA, or Virginia belong in the same group as Columbia, Cornell, and Michigan. New York University (Kruskal-Wallis $p = .434$; ANOVA $p = .096$) could be included or excluded depending on the selection criteria, as could Illinois (Kruskal-Wallis $p = .172$; ANOVA $p = .113$). All other schools could be rejected for inclusion because at least one of the tests yields p -values falling at or below the .05 level. There are thus from eight to 10 schools in a second logical grouping by these measures, with Illinois not warranting clear inclusion or exclusion by either test.

To explore a third group, we start by treating Duke, Georgetown, Illinois, Minnesota, USC, and Texas as a unit. Using Kruskal-Wallis and ANOVA tests, the p -values for the hypothesis that these schools are from the same population are .987 and .992, respectively. One could not reject the hypothesis that Colorado, Emory, Vanderbilt, Iowa, Indiana, Cardozo, George Washington, Chicago-Kent School of Law, and George Mason belong with this group. Boston University (Kruskal-Wallis $p = .165$; ANOVA $p = .733$) and University of Wisconsin (Kruskal-Wallis $p = .106$; ANOVA $p = .341$) are borderline decisions, and University of North Carolina (Kruskal-Wallis $p = .079$; ANOVA $p = .472$) and University of Washington, Seattle, (Kruskal-Wallis $p = .006$; ANOVA $p = .042$) could plausibly be excluded.

To further explore the robustness of our rankings, we test the effects on school rank of the most frequently cited members of each faculty. If one excludes from every school the faculty members in the school's highest citations decile, no school would move ahead of the top four schools or ahead of Michigan, Cornell, or Columbia. The solidity of the top group of four schools also survives excluding the top decile from *only* those four schools. They would still be the top four schools. Thus, for example, Chicago could lose its three most highly cited faculty members and still remain ahead of all schools other than Yale, Harvard, and Stanford. Our groupings are not

attributable to one or two frequently cited scholars at leading institutions. They thus should be resistant to dramatic change based on the movement of one or two faculty members.

B. Big Schools versus Small Schools and the Per-Faculty-Member Decision

Citations per faculty member takes into account faculty size. Citation literature does not always follow this practice.²⁸ Adjusting for faculty size raises the question whether the study favors small schools over large schools. Certainly, not adjusting for faculty size would favor large schools over small schools. Other things being equal, one simply needs more faculty members to rank more highly. It is not clear that per capita rankings favor small schools. Large schools should be expected to have a larger absolute number of low-impact faculty members. But their percentage should not be higher. If a school with 60 faculty members might be expected to have 20 percent low-impact scholars, yielding 12, then a school with 30 faculty would be expected to have six low-impact faculty members. Unless large schools are somehow expected to have a larger percentage of low-impact scholars because of their size, a per capita measure should not be biased against them. And three of eight large schools (more than 50 faculty members) do rank in the top 10, with a fourth ranking eleventh, even using a per capita system.

Even using the per-faculty-member methodology, large schools may have a small inherent advantage. Suppose a large school has four people teaching constitutional law, that they each write one article, and that they each cite each other in those articles. That yields four articles and 16 cites for that school. Dividing by four yields a per capita citation rate of four. Now suppose a small school has two people teaching constitutional law, that they each write one article, and that they each cite each other in those articles. That yields two articles and four citations for that school. Dividing by two yields a per capita citation rate of two.

Yet the only difference between the large and small school here may be in their within-school impact. The rest of the world may think the large and small schools' works are equally citable. So, even using a per capita method, large schools may have a slight advantage if they have more people working in the same field who cite each others' work.

Other factors cloud the question whether a particular methodology favors large schools over small schools. On the one hand, if large schools tend to

²⁸ Conroy *et al.*, *supra* note 1. But it seems more informative to report results that both do and do not account for faculty size, as is done here and in Borokhovich *et al.*, *supra* note 1, at 1699, 1703, 1704, 1706, 1708, 1709.

have large student bodies, they need more people teaching basic courses like constitutional law and presumably writing in the area. Works in areas covered by basic courses may be more likely to be cited in law reviews.²⁹ On the other hand, if large schools (measured by number of faculty) have relatively small student bodies, they can offer more esoteric courses. People writing in more esoteric areas are less likely to be cited by other people. The net effect of the large versus small distinction is not clear. Per capita rankings can be thought of as measuring how well schools allocate their resources rather than as measuring how much overall impact they have.

For those favoring absolute rather than per capita impact, Table 3 presents the sum of citations for each school, with schools divided into three size categories: those with fewer than 40 faculty members, those with 40–50 faculty members, and those with more than 50 faculty members.

Table 3's most striking feature is that using total citations does not alter the top four schools. Chicago, Yale, Stanford, and Harvard have the four greatest total citations. Even below the top four, accounting for size by Table 3's crude size categories rather than per capita does not dramatically shift Table 1's results. For example, Cornell, which ranks from fifth to seventh on a per capita basis, is the second-most-cited school with less than 40 faculty members (ranking behind Chicago), even though its faculty size, 30, is at the low end of this group of schools. In the second size group, Stanford ranks behind Yale, with Columbia and Michigan substantially behind Stanford, but substantially ahead of any other school. The largest schools, such as Harvard, NYU, Texas, and Georgetown would rank noticeably higher if total citations were used.

C. *Comparison with Other Published Rankings*

Since no single ranking system can capture all relevant features of academic impact, it is instructive to compare our results with other ranking systems. The first comparison is not with a system but with an impressionistic, partially tongue-in-cheek, essay on citations. Jack Balkin and Sanford Levinson regard the top three schools as being so obvious that citation studies may be unnecessary.³⁰ Their advice: if you want to be cited, teach at Harvard, Yale, or the University of Chicago. These schools apparently are grouped in a class by themselves.³¹ This study suggests that methods of analysis slightly more rigorous than theirs would include Stanford in the

²⁹ Table 7 shows that citations to constitutional law teachers exceed the citations to almost all other subjects.

³⁰ Balkin & Levinson, *supra* note 7.

³¹ But see *id.* at 853 n.39 (treating John Ely's move to Stanford as "lateral movement").

TABLE 3
SUM OF CITATIONS BY SCHOOL SIZE

	Sum of Citations	No. of Faculty
Fewer than 40 faculty members:		
Chicago	11,963.2	29
Cornell	5,662.6	30
Minnesota	4,864.3	35
Duke	4,691.5	36
Pennsylvania	4,503.4	31
USC	4,329.0	32
Iowa	3,897.0	38
Colorado	3,841.0	29
Illinois	3,717.3	27
Emory	2,999.4	34
Cardozo	2,852.8	37
Indiana	2,735.2	34
Vanderbilt	2,481.9	28
Chicago-Kent	2,273.1	34
George Mason	1,788.4	27
Washington, Seattle	1,661.1	34
North Carolina	1,629.2	32
40-50 faculty members:		
Yale	15,140.2	40
Stanford	13,330.7	43
Columbia	10,094.6	49
Michigan	9,122.2	47
Northwestern	6,677.0	40
Wisconsin	3,417.7	47
Boston University	2,749.5	44
More than 50 faculty members:		
Harvard	21,592.7	62
NYU	11,858.1	62
Georgetown	10,924.1	73
Berkeley	8,547.5	52
Texas	8,276.4	60
Virginia	7,894.5	54
UCLA	7,312.2	52
George Washington	4,074.0	51

SOURCES.—Westlaw tp-all database; Association of American Law Schools, The AALS Directory of Law Teachers, 1993-1994 (1993).

top group. Their failure to clearly identify one of the top schools also suggests that something more than one's instincts should be a basis for evaluating schools' citation performances. We suspect that the Balkin-Levinson methodology completely breaks down when one moves beyond the top three (or four) schools.

TABLE 4
COMPARISON OF THREE METHODS OF RANKING

School	1996 <i>U.S. News & World Report</i> Reputation	Chicago-Kent Productivity	Average Rank from Table 1
Yale	1	2	1.5
Chicago	2	1	1.5
Stanford	2	15	3.0
Harvard	2	4	4.0
Columbia	2	8	6.0
Cornell	11	3	6.0
Michigan	6	16	6.0
NYU	6	18	8.0
Virginia	6	12	9.5
Northwestern	11	10	10.0
Berkeley	6	11	10.5
Pennsylvania	6	6	12.0
UCLA	6	22	13.0
Illinois	23	34	14.0
Texas	11	5	15.0
Georgetown	11	9	16.5
USC	20	14	17.5
Duke	11	21	17.5
Minnesota	17	17	18.5
Colorado	37	7	20.5
Emory	24	40	20.5
Vanderbilt	17	23	22.5
Iowa	20	13	22.5
Indiana	30	35	24.0
Cardozo	58	20	25.5
George Washington	24	45	25.5
Chicago-Kent	45	28	27.5
Boston University	24	19	28.0
Wisconsin	17	26	28.5
George Mason	65	...	30.0
North Carolina	20	...	31.0
Washington, Seattle	24	...	32.0

SOURCES.—U.S. News & World Report (1996); Chicago-Kent Law Review Faculty Scholarship Survey (1995). Also see Table 1.

Their impressions also suggest a rigid hierarchy that does not exist. If the citations pecking order were as clear as they believe, one might expect nearly all faculty members at the top three or four schools to be in the upper quartile of professors. Yet only Yale has a majority of its faculty members in the top quartile by citations. Highly cited professors are spread quite broadly across more than a dozen schools.

Moving to more serious quantitative ranking efforts, Table 4 lists the 1996 *U.S. News & World Report* academic reputation ranking of law

schools and the Chicago-Kent faculty productivity ranking of law schools together with this study's overall rankings from Table 1. All three ranking systems put Yale and Chicago at the top. Beyond the top four schools, this study suggests that *U.S. News & World Report's* methodology overrates Columbia's scholarly reputation by including it with the top four schools. One of our clearest findings is the large gap between the top four schools and the next seven or eight.

U.S. News & World Report's methodology suggests a possible source of the difference. *U.S. News* reports that its reputation ranking among academics is based on a survey. Four faculty members at each school, including deans, were asked to rate by quartiles the reputation of each school.³² Thus, for any differences to emerge in schools' academic reputations simply means that someone in the *U.S. News* survey had to rank schools in different quartiles. For Yale to outrank all other top schools, *U.S. News's* methodology requires that someone have omitted the other schools from the top quartile. For example, if everyone who *U.S. News* surveyed placed Yale in the top quartile, then for Yale to outrank Chicago, Harvard, and Stanford someone would have had to have ranked each of the latter three schools in something other than the top quartile. But it is likely that respondents who put any of these three schools in something other than the top quartile were merely playing games and not supplying a serious ranking. What is the theory of academic reputation that could have such schools in something other than the top quartile of over 150 law schools?

Stanford, Michigan, and NYU have large differences in their rankings between the *U.S. News & World Report* system and the Chicago-Kent system. This study ranks them more highly than the Chicago-Kent system. That system's limitations on what sources count toward measuring productivity, the exclusion of books and of articles not published in selected law reviews, may explain the differences.

Both this study and the Chicago-Kent study suggest that *U.S. News & World Report's* reputation-based rankings overrate some schools, though differences tend not to be dramatic in the ranking of the top 15 or 20 schools. Both objective studies suggest that *U.S. News* underrates Cardozo, Cornell, Colorado, Chicago-Kent, and George Mason. Although Cornell's ranking is not dramatically different from that in *U.S. News*, and our own grouping methodology could support ranking Cornell as low as about eleventh, *U.S. News's* questionable methodology leads to treatment of other schools that is highly questionable. Colorado, Chicago-Kent, Cardozo, and George Mason rank much lower than we find supported by their rates of

³² *U.S. News & World Report*, *supra* note 1, at 83.

citations. *U.S. News's* technique of asking people to rank all schools by quartiles may lead to especially large errors when the schools are not as well known as the most highly ranked schools. For schools with which they are not familiar, raters may literally be randomly filling out the *U.S. News* questionnaires.³³

D. More Fully Accounting for Years of Teaching

Faculties have different teaching-experience distributions. The overall mean is 19.6 years of experience. Cardozo faculty members average 15.7 years of teaching experience, the lowest of any studied school, while Yale faculty members average 23.8 years of experience, the highest. In assessing schools' impact, one can respectably overlook this difference in experience. Impact can be viewed as independent of experience. But it remains of interest to provide an experience-adjusted measure of impact. Given the greater experience of its faculty, perhaps Yale should be viewed as having to have 50 percent more citations than Cardozo to outrank it on an experience-adjusted basis. Differences in impact may be attributable to differences in faculties' experience.

Not only are there interfaculty experience differences, but citations have a distinctive time trend.³⁴ In the early years of teaching, it is difficult to accumulate many citations. One may have published few articles, and insufficient time has passed for those articles to be invoked in the literature. As one's career progresses, increasing publications and increasing time in which one's publications may be cited should generate increasing citations. At some point in one's career, however, productivity may decline or works

³³ Other recent scholarly ranking studies exist. David E. Rovella, *A Survey of Surveys Ranks the Top U.S. Law Schools*, Nat'l L. J., June 2, 1997, at A1, A18 (reporting the results of Brian Leiter's study); Robert M. Jarvis & Phyllis G. Coleman, *Ranking Law Reviews: An Empirical Analysis Based on Author Prominence*, 39 Ariz. L. Rev. 15 (1997). Although any study, including this one, requires some subjective judgments, these two studies are more subjective than we believe necessary to provide useable rankings. Leiter's ranking of schools' scholarly influence includes only faculty members with at least 200 citations in Lexis as of October 1996. This excludes the bulk of faculty members at nearly every school in the study. And it excludes frequently cited scholars in what Leiter determines to be trendy legal theory areas. In 1998, Leiter's methodology changed. For Leiter's most recent study, see (<http://www.dla.utexas.edu/depts/philosophy/faculty/leiter/main.html>). The Jarvis-Coleman study of law reviews is based on the prestige of authors appearing in those reviews. But it is based on a rather arbitrary assignment of prestige scores. For example, a journal receives a higher rating for publishing an article by any district court judge than for publishing an article by any law professor, regardless of the reputation or credentials of the judge or professor. And publishing an article by a "Major Celebrity" receives nearly 50 percent more credit than publishing an article by any law professor. See Jarvis & Coleman, *supra*, 17-18.

³⁴ Landes & Posner, *supra* note 7.

FIGURE 2.—Kernel-smoothed citations (log) by years in teaching. Sources: Westlaw tp-all database; Association of American Law Schools, The AALS Directory of Law Teachers, 1993–1994 (1993).

grow less relevant to current problems. This could lead to a leveling of citations to one's work.

To explore the relation between years in teaching and citations, Figure 2 presents a kernel-smoothed graph³⁵ of citations (log) as a function of years in teaching. The kernel-smoothed curve gives a nonparametric estimate of the true relationship between time and log cites and does not depend on any a priori specified functional form (such as linear, polynomial, or exponential). As the sample size is approximately 1,300, there is a sufficient amount of data for one to appeal to the large-sample consistency properties of the nonparametric kernel regression estimator to claim that the true relationship between time and log cites has been recovered to a high degree of accuracy. Figure 2 shows that citations do substantially increase during the early years of careers. By about the seventeenth year, they level off and may even start to decrease.³⁶

³⁵ M. P. Wand & C. M. Jones, *Kernel Smoothing* (1995).

³⁶ Caution is necessary before accepting Figure 2 at face value. Recall that the full name citation form was not required by the *Bluebook* until 1991 and that the tp-all database con-

The effect of experience on ranking is thus worth considering. To provide rankings that control for the experience level of faculties, we develop a time-adjusted measure of citations. For each faculty member, it is the logarithm of citations divided by the values of citations (log) at each point on the best-fitting smoothed time-trend line shown in Figure 2. For example, according to Figure 2, for faculty members who have been teaching for 10 years, we divide citations (log) by approximately 4. For faculty members in teaching for 20 years, we divide by about 4.5. Thus time-adjusted citations should have a mean of approximately 1.0. The mean for 1,292 faculty members is in fact 1.01, and the median is 1.05.

To explore school rankings controlling for experience, we use a regression model in which time-adjusted citations is the dependent variable. The model uses a dummy variable for each school as the independent variables. The coefficient for each school's dummy variable can be used to rank the schools, holding constant their faculties' different experience levels. Only Chicago, Harvard, and Yale have positive coefficients relative to Stanford, and none are statistically significantly different from Stanford. But, by this measure, using a .05 significance level, Columbia ($p = .108$) and Michigan ($p = .081$) could also not be rejected from the top group.

IV. EXPLAINING THE PATTERN OF SCHOLARLY IMPACT

This section explores the forces shaping citation patterns. It first explores the relation between citation frequency and (1) lateral hires compared with entry-level hires, (2) female faculty members compared with male faculty members, (3) minority faculty members compared with nonminority faculty members, (4) subject areas taught, and (5) years in teaching. It then employs regression analysis to model citation frequency. Table 5 presents summary statistics for the groups studied. The time-adjusted citations reported in the last column are based on the methodology described in Section III.

A. *Entry-Level Hires and Lateral Hires*

We explore two separable aspects of lateral hiring. First we explore whether lateral or entry-level hires have greater scholarly impact. After assessing other influences on scholarly impact, we return to the lateral hires issue by modeling the influences on the decision to hire a lateral faculty member.

Common sense suggests that lateral hires should systematically outper-

tains relatively few documents before the mid-1980s. For other citation time trends, see Corrado & Ferris, *supra* note 1, at 2096; and Zivney & Bertin, *supra* note 1, at 308.

TABLE 5
SUMMARY STATISTICS OF FACULTY CHARACTERISTICS AND CITATIONS

	N	Percent of Faculty	Years Teaching	Median Years Teaching	Mean Citations	Median Citations	Time-Adjusted Citations
Lateral	508	39.4	23.2	23	208	119	1.06
Entry level	780	60.6	17.3	15	126	67	.98
Female	250	19.2	13.1	12	125	58	.98
Male	1,052	80.8	21.2	21	164	89	1.02
Minority	111	8.5	12.7	12	122	39	.94
Nonminority	1,191	91.5	20.3	20	160	86	1.02
Nonminority female	212	16.3	13.3	12	126	61	1.00
Nonminority male	979	75.2	21.8	22	167	91	1.02
Minority female	38	2.9	11.9	12	121	26	.88
Minority male	73	5.6	13.1	12	124	50	.97
All faculty	1,302	100.0	19.6	19	156	85	1.01

SOURCES.—Westlaw tp-all database; Association of American Law Schools, The AALS Directory of Law Teachers, 1993–1994 (1993).

form entry-level hires. Entry-level faculty members often have slender or nonexistent publication records. "Laterals," by definition, have track records as scholars and teachers. Schools thus hire laterals on the basis of more complete information than the information available for entry-level hires. Laterally hired faculty members dominate a list of the most prolific scholars.³⁷

But part of any observed enhanced lateral performance is attributable to their longer tenure in teaching. Lateral hires always have prior academic experience; entry-level hires rarely do. Table 5 shows the mean years in teaching for lateral hires to be 23.2 years compared with 17.3 years for entry-level hires. If entry-level hires performed at the same level as lateral hires, they would have fewer citations to their work because of their shorter teaching tenure. Thus, comparing lateral and entry-level hires requires at least adjusting for the number of years in teaching of the two groups. We use time-adjusted citations. Table 5's time-adjusted citations column indicates that, even controlling for experience, lateral hires outperform entry-level hires.

Table 6 displays each school's time-adjusted mean citations for entry-level and lateral hires and time-adjusted median citations for entry-level and lateral hires. The two right-hand columns show, respectively, the number of faculty members in the study at each school and the proportion of the school's faculty consisting of lateral hires. For example, the first row of Table 6 shows that the Berkeley's entry-level hires averaged 1.08 time-adjusted citations, its lateral hires averaged 1.05 time-adjusted citations, its entry-level hires had a median of 1.09 time-adjusted citations, and its lateral hires had a median of 1.13 time-adjusted citations. The first row also shows that 50 Berkeley faculty members are included in the lateral/entry-level analysis and that 34.0 percent of Berkeley's faculty was hired laterally.

School-by-school analysis confirms the higher citation rates of lateral hires. At four of the 32 schools, the mean time-adjusted citations per year were higher for entry-level hires than for lateral hires, and there was a tie at three schools. At 25 of 32 schools, the mean time-adjusted citations were higher for lateral hires. At only five of 32 schools did entry-level medians exceed lateral-hire medians. A Mann-Whitney two-sample test statistic of the entry-level and lateral time-adjusted citations yields a *p*-value of less than .0001.³⁸ One can thus reject the hypothesis of equality of medians of citations of entry-level and lateral hires. A *t*-test of the hypothesis that the log of entry-level and lateral-level time-adjusted citations are equal yields

³⁷ Lindgren & Seltzer, *supra* note 1, at 804-5.

³⁸ See H. B. Mann & D. R. Whitney, On a Test of Whether One of Two Random Variables Is Stochastically Larger than the Other, 18 *Annals Math. Stat.* 50 (1947).

TABLE 6
ENTRY-LEVEL AND LATERAL HIRE TIME-ADJUSTED CITATIONS AND
PERCENT OF FACULTY THAT ARE LATERAL HIRES

	MEAN TIME-ADJUSTED CITATIONS		MEDIAN TIME-ADJUSTED CITATIONS		N	PERCENT LATERAL HIRES
	Entry-Level Hires	Lateral Hires	Entry-Level Hires	Lateral Hires		
Berkeley	1.08	1.05	1.09	1.13	50	34.0
Boston University	.87	.97	.89	1.03	41	36.6
Cardozo	.95	.90	.96	.95	34	38.2
Chicago	1.25	1.30	1.24	1.26	29	37.9
Chicago-Kent	.80	.98	.78	.95	34	47.1
Colorado	.90	1.04	.91	1.12	29	37.9
Columbia	1.10	1.18	1.09	1.22	47	42.6
Cornell	.96	1.13	1.06	1.17	30	56.7
Duke	.93	1.01	1.03	1.00	36	47.2
Emory	.97	.99	.99	1.06	31	32.3
George Mason	.87	.87	.79	.89	25	64.0
Georgetown	.88	1.06	.90	1.06	71	43.7
George Washington	.83	.98	.91	1.01	49	51.0
Harvard	1.21	1.21	1.21	1.17	61	29.5
Illinois	1.00	.97	1.05	.93	27	25.9
Indiana	.93	.96	.93	1.05	33	39.4
Iowa	.91	1.02	.89	1.07	38	28.9
Michigan	1.10	1.15	1.15	1.16	44	38.6
Minnesota	.93	.96	.93	.98	32	37.5
North Carolina	.83	.91	.82	.94	32	21.9
Northwestern	1.05	1.09	1.00	1.15	39	38.5
NYU	.95	1.07	1.06	1.20	61	39.3
Pennsylvania	1.05	1.10	1.05	1.12	31	35.5
Stanford	1.17	1.25	1.16	1.27	42	52.4
Texas	.93	1.04	.96	1.11	58	46.6
UCLA	1.04	1.12	1.03	1.04	52	32.7
USC	.99	.97	1.06	1.12	31	25.8
Vanderbilt	.97	.97	1.08	.93	27	33.3
Virginia	1.08	1.09	1.11	1.18	53	43.4
Washington, Seattle	.70	.75	.72	.83	30	33.3
Wisconsin	.82	.89	.83	.92	42	35.7
Yale	1.17	1.34	1.18	1.35	40	52.5
All 32 schools	.98	1.06	1.02	1.10	1,279	39.6

SOURCES.—Westlaw tp-all database; Association of American Law Schools, The AALS Directory of Law Teachers, 1993–1994 (1993).

FIGURE 3.—Sum of each school's mean and median citations as a function of percent of faculty hired laterally. Sources: Westlaw tp-all database; Association of American Law Schools, The AALS Directory of Law Teachers, 1993–1994 (1993).

a *p*-value of .0001. So the prevailing intuition about how entry-level and lateral hires perform is true. Nevertheless, there are a few schools at which the pattern does not hold, including, most prominently, Harvard.

Table 6 also suggests an explanation of why some similar schools outrank others. For example, of the top four schools, Harvard combines very strong entry-level performance with strong but more modest lateral-hire performance. Harvard's lateral hires have lower mean and median rates of time-adjusted citations than the other top three schools. In addition, Harvard has the lowest rate of lateral hiring of any top-10 school, and its difference in lateral hiring rate is statistically significantly different (beyond the .05 level) from the rate of other top-10 schools. Thus, Harvard combines a low rate of lateral hiring with a relatively low (compared with other top-four schools) impact for the laterals it does hire. Yale and Stanford outrank Harvard largely because of the higher impact and greater proportion of their lateral hires.

Figure 3 further explores the relation between a school's tendency to hire laterally and its scholarly impact. It graphs the sum of a school's mean cita-

tions plus its median citations as a function of the percentage of the school's faculty that was hired laterally.

Figure 3 suggests that Cornell, George Mason, George Washington, Stanford, and Yale have made more substantial use of lateral hiring than other schools. Cornell, Stanford, and Yale have also achieved high scholarly impact. Harvard demonstrates the possibility of achieving substantial impact without much lateral hiring. This may be due to Harvard's power at the entry-level stage. And Chicago is near neither the high nor low lateral hiring rates and fares quite well. Lateral hiring can be important, but it neither assures a high scholarly impact ranking nor precludes a low one.

B. Sex and Race Differences

The relative performance of males and females and of minorities and nonminorities are of continuing interest. Minority status in this study is based on the self-declared status published in the AALS directory. Some faculty members listed as minorities in the directory are plainly not thought of as being members of conventional minorities, and this could influence one's interpretation of the results.

As in the case of lateral and entry-level hires, years of teaching experience vary between females and males and between minorities and nonminorities. Females, as a group, have been in teaching many fewer years than males. Twenty-five percent of males in the sample have been teaching for 30 or more years compared with about 1 percent of females. Table 5 shows that, on average, males in the sample have been in teaching 8 years longer than females and that, on a simple per capita basis, females are cited less frequently than males. In a similar manner, minorities as a group have been in teaching many fewer years than nonminorities. Table 5 shows that, on average, nonminority faculty members have been in teaching 7.6 years longer than minority faculty members and that, on a simple per capita basis, minorities are cited less frequently than nonminorities. The last column of Table 5 also shows that, adjusted for years in teaching, males slightly outperform females and nonminorities slightly outperform minorities.

The difference between nonminority males and nonminority females is not statistically significant (t -test p -value = .373), whether one tests time-adjusted means or medians. The difference in time-adjusted citations of nonminority males and minority females is statistically significant (t -test p -value = .003). The difference in time-adjusted citations of nonminority males and minority males is at most marginally statistically significant (t -test p -value = .136).³⁹

³⁹ Simpler, but less complete, adjustments to reflect the time pattern of citations can lead to strikingly different results. If one does not adjust at all for years in teaching, then nonmi-

These results are sensitive to whether one limits the sample to those in teaching more than 7 years. The nonminority male–minority female effect fades when one limits the sample to those in teaching more than 7 years (t -test p -value = .483). And the difference between these two groups is highly significant if one limits the sample to those in teaching fewer than 8 years (t -test p -value < .0001). For this inexperienced cohort, in which nonminority males are much less numerically dominant,⁴⁰ a significant difference also emerges between nonminority males and nonminority females (t -test p -value = .028), and a near-significant difference exists between nonminority and minority males (t -test p -value = .098). These results suggest that nonminority males either enter teaching with more citable publications or more quickly produce them. This is consistent with insisting on prehiring publications for nonminority males to a greater extent than for other groups.

Figure 4 presents kernel density estimates⁴¹ of the distribution of citations of minority and nonminority faculty members. The differences are at the upper end of the citations distribution, where minorities tend to fare better, and in the lower third of the distribution, where nonminorities tend to be cited more frequently. Both differences contribute to a flatter distribution of time-adjusted minority citations. This picture does not substantially change if one limits the sample to those in teaching more than 7 years. This pattern seems consistent with a risk-taking approach to minority hiring in which those who succeed receive many citations and those who do not tend to be below the nonminority average. Regression results reported in Section IVD provide only marginally significant evidence of minority presence in the bottom quartile of time-adjusted citations, after controlling for subject areas taught.

C. Subject Area Differences

Law school faculties are not uniformly distributed across subject areas. For example, many more faculty members teach constitutional law courses

nority males significantly outperform other groups, as shown by Table 5. If one adjusts only by dividing citations by years of teaching, nonminority females outperform nonminority males, and if one limits the sample to faculty members in teaching more than 7 years, the female-male gap widens. Females average 11.1 citations per year of teaching and males 8.8. A t -test yields a p -value of .020, with females outperforming males. A Mann-Whitney two-sample t -test of female and male citations per year of teaching yields a p -value of .055, with females outperforming males.

⁴⁰ Nonminority males make up 52.6 percent of the 192 faculty members in teaching less than 8 years and 79.2 percent of the 1,129 faculty members in teaching more than 7 years.

⁴¹ The more traditional way of portraying univariate statistical distributions, the histogram, can be thought of as a kind of kernel density estimator. Kernel density estimates have the advantages of being smooth and of being independent of bin location, a choice that can profoundly shape the appearance of a histogram. B. W. Silverman, *Density Estimation for Statistics and Data Analysis* (1986).

FIGURE 4.—Kernel density estimates of the distribution of time-adjusted citations of minority and nonminority faculty members. Sources: Westlaw tp-all database; Association of American Law Schools, The AALS Directory of Law Teachers, 1993–1994 (1993).

than teach tax courses. Since faculty members who teach in an area tend to write in that area, one might expect those teaching in areas with more faculty members to have a greater opportunity to be cited than those teaching in other areas. In addition, the prominence of constitutional law articles in student-run law reviews⁴² suggests that constitutional law scholars should fare unusually well in this study. Furthermore, authors in some areas of law may tend to cite each others' work more than authors in other areas of law.

⁴² Mark Tushnet & Timothy Lynch, *The Project of the Harvard Forewords: A Social and Intellectual Inquiry*, 11 *Const. Comment* 463, 464 (1994–95) (quoting James Liebman for the proposition that 11 of 26 *Harvard Law Review* forewords covered equal protection). But we note that part of constitutional law's prominence in law reviews must stem from the fact that, as Table 7 shows, more faculty members teach in the field of constitutional law than in any other field.

Table 7 explores the relation between citations and subject area. The first two numerical columns show the number of faculty members teaching a subject according to the AALS directory and the percent of all faculty members listed as teaching a subject. Since faculty members teach more than one subject, the number of faculty members in the first column does not cumulate to equal the total number of faculty members. The multisubject characterization of each faculty member probably understates the differences across subject areas. For example, a person who teaches tax but who teaches and writes about other subjects that are more frequently cited would count as both a tax person and a person who teaches those other subjects. The third numerical column shows the mean time-adjusted citations for each subject area. The significance columns in Table 7 test the hypotheses that the subject area represented by the row does not differ from all other subject areas combined.

Table 7 supports some instincts about subject areas. It shows that constitutional law is taught by more professors than any other subject. And constitutional law scholars enjoy the highest rates of citation for any group other than a small group teaching feminist courses. The high feminist citation rate may stem in part from the close connections among feminist writing, constitutional law, and another highly cited area, jurisprudence. Administrative law, antitrust law, and law and economics also enjoy high citation rates. Commercial law, comparative law, and tax law are taught by professors with significantly lower citation rates than other areas. And bankruptcy law and international law could be viewed as cited significantly less, depending on the significance level selected.

Figure 5 further explores the relationship between constitutional law and scholarly impact. It graphs the sum of a school's mean citations plus its median citations as a function of the percentage of the school's faculty that is listed in the AALS directory as teaching constitutional law. Chicago and Yale are distinctive in the percentages of their faculty engaged in teaching constitutional law. This contributes to their high ranking. The gap between them and Harvard and Stanford substantially decreases if one excludes professors who teach constitutional law.

D. Further Regression Analyses

The previous subsections analyze influences on citation rates in isolation from one another. An effect, or the absence of an effect, may be a consequence of not controlling for relevant factors. Regression analysis allows us to study the influence of one factor while holding other factors constant. We first model the number of citations and then examine the influences on the decision to hire laterally.

TABLE 7
TIME-ADJUSTED CITATIONS BY SUBJECT AREA

	N Teaching	Percent Teaching	Time-Adjusted Citations	t-test Significance	Mann-Whitney Test Significance
Administrative law	114	8.7	1.10	.002	.001
Antitrust law	65	5.0	1.12	.002	.001
Bankruptcy law	59	4.5	.94	.061	.069
Civil procedure	191	14.5	1.05	.085	.117
Commercial law	92	7.0	.95	.031	.065
Comparative law	81	6.2	.95	.051	.022
Conflicts of law	70	5.3	.96	.141	.330
Constitutional law	263	20.0	1.16	.000	.000
Contracts	209	15.9	1.03	.299	.261
Corporations	143	10.9	.99	.456	.763
Criminal law	173	13.2	1.03	.312	.374
Criminal procedure	114	8.7	1.02	.860	.937
Environmental law	64	4.9	1.07	.111	.143
Evidence	109	8.3	.98	.195	.170
Family law	46	3.5	.99	.544	.586
Feminism	12	.9	1.22	.014	.006
International law	156	11.9	.97	.071	.104
Jurisprudence	124	9.4	1.08	.007	.012
Labor law	62	4.7	1.02	.774	.888
Law and economics	59	4.5	1.11	.007	.002
Legal history	61	4.6	1.02	.865	.737
Products liability	25	1.9	1.04	.632	.818
Professional responsibility	120	9.1	1.00	.589	.594
Property	88	6.7	1.03	.534	.826
Tax	87	6.6	.88	.000	.000
Torts	157	12.0	1.01	.793	.664
Women and the law	17	1.3	1.07	.423	.390
All subjects	1,313	100.0	1.01	...	...

SOURCES.—Westlaw tp-all database; Association of American Law Schools, The AALS Directory of Law Teachers, 1993-1994 (1993).

NOTE.—The t-test significance column tests the significance of the difference in mean time-adjusted citations for each subject area compared with all other subject areas. The Mann-Whitney significance column tests the significance of the difference in median time-adjusted citations for each subject area compared with all other subject areas.

FIGURE 5.—Sum of each school's mean and median citations as a function of percent of faculty teaching constitutional law. Sources: Westlaw tp-all database; Association of American Law Schools, The AALS Directory of Law Teachers, 1993–1994 (1993).

Number of Citations. To model the number of citations, we use time-adjusted citations as the dependent variable. A time variable, *delay*, is each faculty member's age minus years of teaching. It thus corresponds to how late in a career a faculty member took up teaching. We also include dummy variables for nonminority female faculty members, minority female faculty members, minority male faculty members, and subject areas. The reference category for subject areas consists of those faculty members not listed as teaching any of the subjects represented by a subject area dummy variable.

Table 8 presents the results. The first model includes all faculty members using ordinary least squares regression. The second model limits the faculty to those in teaching less than 8 years. The third model uses quantile regression to estimate coefficients for presence in the top three quartiles. A negative coefficient in this model corresponds to greater presence in the bottom quartile of citations.

For the subject area dummy variables, not reported here, the ordinary least squares models show that teaching antitrust law, constitutional law, contract law, feminist courses, and law and economics courses correlates

TABLE 8
REGRESSION MODELS OF TIME-ADJUSTED CITATIONS

	ALL FACULTY OLS	FACULTY TEACHING MORE THAN 7 YEARS	
		OLS	Top 3 Quartiles
Constant	1.090*** (18.33)	1.128*** (16.52)	1.005*** (9.83)
Delay	-.004** (-2.22)	-.006*** (-2.62)	-.007** (-2.13)
Nonminority female	-.014 (-.68)	.001 (.05)	-.000 (-.01)
Minority female	-.105* (-1.90)	-.014 (-.19)	-.116 (-1.22)
Minority male	-.048 (-1.31)	-.048 (-1.06)	-.118 (-1.40)
<i>N</i>	1,288	1,100	1,100
<i>R</i> ² (adjusted or pseudo)	.103	.115	.092

SOURCES.—Westlaw tp-all database; Association of American Law Schools, The AALS Directory of Law Teachers, 1993–1994 (1993).

NOTE.—OLS = ordinary least squares. Dependent variables are time-adjusted citations. Subject area dummies are not reported. The first two models report OLS regressions with *t*-statistics based on robust SEs in parentheses. The third model reports a quantile regression for the upper three quartiles of time-adjusted citations. *t*-statistics are in parentheses. The second and third models limit the sample to those in teaching more than 7 years. For the quantile regression model, SEs are calculated using bootstrap resampling with 1,000 replications. See B. Efron & R. J. Tibshirani, *An Introduction to the Bootstrap* (1993).

* $p < .1$.

** $p < .05$.

*** $p < .01$.

significantly ($p \leq .05$) with increased time-adjusted citations compared with the reference case category of those teaching courses not otherwise classified. The models also suggest that comparative law and tax law teachers are significantly less frequently cited than the reference category.

Table 8's results provide no substantial evidence of differences between nonminority males and nonminority females. Near significant differences between nonminority males and minority females survive the other regression controls, but these differences fade for the sample limited to those in teaching more than 7 years. For the sample limited to those in teaching more than 7 years, we find only modest evidence that, controlling for subjects taught, minority professors are more likely to be in the bottom quartile of time-adjusted citations, compared with nonminority males. The effect is at most marginally statistically significant for minority males and of the same magnitude but not significant for minority females. The pattern suggested by Figure 4 thus survives controlling for subject areas but at marginal significance levels.

TABLE 9
LOGISTIC REGRESSION MODELS OF LATERAL HIRING

	Model 1	Model 2
Constant	1.432** (2.31)	1.077 (1.44)
Time-adjusted citations	.913*** (3.65)	1.198*** (4.02)
Delay in entering teaching	-.079*** (-4.59)	-.094*** (-5.26)
Nonminority female	-.161 (-.81)	-.178 (-.84)
Minority female	.530 (1.16)	.518 (1.16)
Minority male	.003 (.01)	.068 (.22)
<i>N</i>	1,090	1,090
Pseudo <i>R</i> ²	.067	.104

SOURCES.—Westlaw tp-all database; Association of American Law Schools, The AALS Directory of Law Teachers, 1993–1994 (1993).

NOTE.—Dependent variable is whether faculty member is a lateral hire. Subject area dummies are not reported for model 1, which does not include school dummies. Subject area and school dummies are not reported for model 2. The sample for both models is limited to those in teaching more than 7 years. The first model excludes dummy variables for schools. *t*-statistics based on robust SEs are in parentheses.

** $p < .05$.

*** $p < .01$.

The Decision to Hire Laterally. To model the decision to hire laterally, we employ logistic regression models in which the dependent variable equals one if a faculty member is a lateral hire and zero otherwise. We include delayed entry into teaching, dummy variables for female and minority status, and subject areas. We also include as an explanatory variable each faculty member's time-adjusted citations, which we expect to be an important measure of the rationality of lateral hiring. We limit the sample to those in teaching more than 7 years.

Table 9 presents the results. It suggests that a faculty member's time-adjusted citations and stage of career when entering teaching are important determinants of being hired laterally. Subject area effects (not reported) show that civil procedure and torts have negative significant correlations with lateral hire status. Jurisprudence and products liability have positive significant correlations. Most of the individual subject areas do not significantly correlate with lateral status. A joint test of the probability that all subject matter coefficients are zero yields $p = .097$ in the model 1 and $p = .041$ in model 2, which includes unreported school dummy variables.

Being a minority female correlates strongly and positively but not significantly with being hired laterally. The size and direction of the minority female effect are somewhat at odds with Merritt and Reskin's finding at the entry-level stage of a modest preference for nonminority women and minority men but not for minority women.⁴³ But they studied only entry-level hiring, and our data focus on lateral hiring.

Overall, lateral hiring seems to depend largely on one's scholarly impact. Subject matter area plays a role but does not drive the process. A more complete model would account for subject matter vacancies on faculties in addition to the subject areas in which professors teach.

V. CONCLUSION

On the basis of one measure of scholarly impact, there are four, and only four, top law schools. Their ranking is robust to several methodological variations. One can adjust for differences in years in teaching and even eliminate the top 10 percent of their faculties, and they would still be the top four schools. Seven or eight schools that, by most measures, cannot meaningfully be distinguished make up a next logical grouping. *U.S. News & World Report's* survey-based ranking of scholarly reputation seems especially weak in distinguishing among schools below the top 15 or 20.

In explaining citation performance, we find that lateral hires outperform entry-level hires, even when controlling for years in teaching, though not at every school. We find no strong evidence that citation performance correlates with sex once one controls for years in teaching. We find evidence that nonminority males in teaching fewer than 8 years have higher citations rates than other groups. This effect fades for those in teaching more than 7 years. For those in teaching more than 7 years, there is modest evidence that minority professors are more likely to be in the bottom quartile of time-adjusted citations. Schools' lateral hiring practices correlate largely with rates of citation to faculty members' works.

⁴³ Merritt & Reskin, *supra* note 12, at 205, 233, 250. But they find the reverse effect when one examines the level at which faculty members were initially hired. *Id.* at 253. We also cannot replicate their finding that females are significantly less likely than males to teach constitutional law. *Id.* at 260. We find that 20.8 percent of males and 16.2 percent of females listed constitutional law as a teaching subject. This difference was not significant at $p = .10$ and became even less significant when we controlled for years in teaching. Differences in the sex-constitutional law effect may be because they focused solely on entry-level hires during a specified time period, whereas we examined entire faculties. In addition, they covered many more schools than this study.