Publishing in the Majors: A Comparison of Accounting, Finance, Management, and Marketing*

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Abstract

Business schools evaluate publication records, especially for the promotion and tenure decision, by comparing the quality and quantity of a candidate's research with those of peers within the same discipline (intradisciplinary) and with those of academics from other business disciplines (interdisciplinary). A recently developed analytical model of the research review process provides theory about the norms used by editors and referees in deciding whether to publish research papers. The model predicts that interdisciplinary differences exist in quality norms, which could result in disparity among business disciplines in the number of top-tier articles published. I examine the period from 1980 to 1999 and, consistent with the theory, find that significant differences exist in the number of articles and proportion of doctoral faculty who published in the "major" journals in accounting, finance, management, and marketing. Most notably, the proportion of doctoral faculty publishing a major article is 1.4 to 2.4 times greater in the other business disciplines than in accounting (depending on the set of journals). The theory also predicts an upward drift over time in the quality norms used by referees. Consistent with a drift, the number of articles published has declined substantially in marketing and, to a lesser extent, in the other business disciplines.

Keywords Accounting research; Journal rankings; Promotion; Publishing

JEL Descriptors M100, M410, A140, M500

Condensé

Dans maintes écoles de gestion, le fait de publier dans les revues les mieux cotées est le critère le plus important de promotion et d'acquisition de la permanence, et il influe considérablement sur le salaire, la charge d'enseignement et le soutien obtenu pendant la période estivale. Pour prendre ce genre de décisions, en particulier celles qui ont trait à la promotion

* Accepted by Gord Richardson. I would like to thank participants at presentations at Georgia State University, Texas A&M University, 2001 Southwest Doctoral Consortium, 2002 Critical Perspectives in Accounting Conference, 2002 AAA Eastern Regional Meeting, 2003 CAAA Annual Conference, and the 2003 Annual AAA Conference. I am particularly appreciative of detailed comments by Joy Begley, Larry Brown, Glenn Ellison, Mike Kinney, Gord Richardson, and two anonymous reviewers. Numerous other people have provided valuable suggestions, including Jim Benjamin, Len Bierman, Angelo DeNisi, Gary Giroux, Lori Holder-Webb, Tom Lopez, Mary Lea McAnally, Lynn Rees, Alan Reinstein, Jeffrey Unerman, Dean Wichern, Mike Wilkins, and Chris Wolfe. This paper was a co-winner of the first AAA Accounting Program Leadership Group Outstanding Paper Award.

dans le processus d'examen en vue d'accepter des articles que les comités de lecture, pour leur part, rejetteraient. En d'autres termes, si les rédacteurs en chef se contentent d'accepter les recommandations des comités de lecture, les niveaux de qualité r exigés par les lecteurs spécialisés risquent d'être à tel point élevés que la production d'articles n'augmentera pas. Les rédacteurs en chef pourraient également augmenter le nombre d'articles publiés en élargissant l'éventail de sujets d'étude en comptabilité. Ellison (2002b) précise que si un cercle universitaire met l'accent sur la qualité q, les chercheurs consacreront la majorité de leur temps à développer des idées. S'il insiste sur la qualité r, les auteurs réagiront en consacrant moins de temps à l'exploration de nouvelles pistes de recherche et davantage à parachever et à peaufiner leurs textes, en se limitant à un bassin d'idées restreint. Dans son mot d'ouverture à titre de président de l'AAA, Joel Demski critiquait en 2001 les progrès du développement des idées dans les revues de comptabilité, expliquant : « Mais nous sommes aux prises avec l'homogénéité intertemporelle, les efforts progressifs plutôt qu'intermittents pour faire avancer notre réflexion, et l'intrusion et le voyeurisme des comités de lecture. » Cette affirmation donne à penser que la comptabilité n'investit pas suffisamment dans la qualité q. Si tel est le cas, le cercle universitaire comptable devrait prendre des mesures pour remédier à la situation.

Les autres disciplines relevant de la gestion offrent une source de sujets potentiels. Ainsi, *The Journal of Finance* accepte et publie comme articles de fond des textes portant sur un vaste éventail de sujets intéressant l'ensemble des membres de la profession et, dans une section réservée à des articles plus courts, des textes de qualité équivalente, mais qui s'adressent à un lectorat spécialisé. Selon Stulz (2000), cette décision a modifié la composition de la revue. Dans la présente étude, l'auteur note que la revue publie en moyenne 28 articles courts par année depuis l'adoption de cette politique, en 1989. En général, il est plus facile pour les rédacteurs en chef de publier dans une section réservée aux articles courts des textes que les comités de lecture rejetteraient comme articles de fond. Second exemple : l'Academy of Management encourage le développement d'idées en publiant une revue principale, *The Academy of Management Review* (AMR), consacrée exclusivement à l'élaboration de théories, et une revue réservée aux études empiriques, l'*Academy of Management Journal*. Pour élargir l'éventail des théories étudiées, l'AMR lance au moins une fois l'an des appels au développement conceptuel de sujets particuliers et publie les textes issus de l'exercice dans sa collection *Theory Development Forums*. Lorsqu'une revue hautement cotée s'engage dans la publication d'études théoriques dans un domaine, les chercheurs sont disposés à consacrer du temps et des efforts à des sujets qu'ils auraient autrement jugés trop hasardeux. Et l'univers de la théorie est vaste (Whetten, 1989).

1. Introduction

At many business schools, publication in highly ranked journals is the primary criterion for promotion and tenure, as well as a strong influence on salary, teaching load, and summer support. In making these decisions, especially the promotion and tenure (P&T) decision, administrators and faculty advisory committees compare publication records across business disciplines.[1] Faculty and administrators tend to use journal quality as a proxy for the quality of a candidate's publications because research quality is difficult to evaluate, especially outside one's discipline.[2] This paper provides comparisons of the number of research articles published in the

most highly ranked journals in accounting, finance, management, and marketing (referred to as "the majors") over the period 1980 to 1999. The paper focuses on a small set of top-tier journals because they receive a particularly heavy weighting in decisions about promotion and tenure (Fishe 1998; Henderson, Ganesh, and Chandy 1990) and salary (Gomez-Mejia and Balkin 1992; Swidler and Goldreyer 1998).

A fundamental issue in such interdisciplinary comparisons is whether a major article published in, say, finance should be weighted the same as a major article published in marketing, management, or accounting. Another important issue is whether expectations for research output should change over time if the difficulty of publishing a major article changes. This issue arises primarily for the promotion and tenure decision because it is based on publications over a rolling interval of time, such as the most recent six years.

Q-r theory, developed by MIT economist Glenn Ellison 2002a to describe the academic review process, predicts that differences in quality norms exist among disciplines and over time within each discipline. *Q-r* theory is based on an analytical model of the standards used by referees and editors to evaluate paper quality. The central premise of *q-r* theory is that referees and editors consider two aspects of paper quality: (1) *q*-quality, which is the inherent importance and interest of the main ideas of the paper, and (2) *r*-quality, which includes various other aspects of quality, including a polished exposition, a clear relation to other papers, robustness tests for empirical results, and extensions to consider related questions. The review process primarily improves *r*-quality to the level required for publication, while higher *q*-quality papers are allowed to have lower *r*-quality.

The quality norms used by referees to determine the required levels of *q* and *r* are essentially arbitrary and nothing precludes extremes. A dynamic learning model in which referees are continuously trying to learn the current social norm for quality is shown to produce a long, gradual evolution of social norms. The *q-r* model predicts that quality norms gradually become more demanding over time and can reach extremes unless editors intervene to accept articles that referees would reject. Referees generally demand higher *r*-quality. Their demands would result in lower article output because many studies do not satisfy the higher level of *r*-quality required for acceptance. In addition, researchers are required to spend so much time meeting very high *r*-quality standards that they are able to complete fewer papers, and this further reduces the number of high-quality papers available to editors. The theory indicates that quality norms evolve independently in each discipline because referees rarely publish or review outside their primary field. Moreover, the extent of editor intervention is likely to vary by discipline. Quality norms that are specific to each discipline and constantly changing provide a reason to expect differences to occur in major article output among disciplines and over time within disciplines.

Little empirical evidence is currently available about interdisciplinary differences in article output. Most of the research productivity literature is conducted within a particular business discipline and focuses on ranking departments, prolific researchers, and journals. Journal rankings generally play the most important role in promotion, salary, and other decisions because, as discussed above, the quality

of an article is often inferred from the journal's ranking. The evidence in the current study complements within-discipline journal rankings by providing interdisciplinary comparisons of article output at the most highly ranked journals in four business disciplines over the period 1980–99. This evidence should help faculty and administrators decide whether to weight articles in the major journals the same, or differently, depending on the business discipline.

I provide two types of empirical evidence. First, using counts of research articles published in top-tier journals, I report annual totals by discipline for accounting, finance, management, and marketing from 1980 to 1999. Second, I report a scaled productivity metric. Because the four business disciplines differ in size, direct comparisons of article counts do not reflect differences among the disciplines in the probability that a faculty member can publish a major article. Therefore, I calculate the number of authors published in a discipline during each year relative to the number of doctoral faculty in the discipline that year in the annual survey by the Association to Advance Collegiate Schools of Business (AACSB).

Because the definition of "top-tier journals" is somewhat arbitrary and can affect the outcome, I report results for four different groups of journals. To add objectivity and to increase the linkage to prior research on publication productivity, I select a base reference set of top-tier journals that is identical to the journals used by Trieschmann, Dennis, Northcraft, and Niemi 2000 (1132–3) (herein referred to as "the Trieschmann set") to rank business schools and individual departments. Their decision to use only two to four journals per discipline is supported by evidence that members of P&T committees know only the top few journals from other disciplines (Henderson et al. 1990). The other three journal groups considered in this study are variants of the Trieschmann set, as discussed further in section 3 and summarized in Table 1.

I find that sizable differences exist among the four disciplines. For the Trieschmann set of journals, accounting publishes an average of 89 articles per year and management publishes 170. Both averages are statistically different from finance and marketing, which average 120 and 119 articles, respectively. When *Contemporary Accounting Research* is added to the Trieschmann set, accounting still publishes the fewest articles (113). (The differences from marketing and finance are no longer statistically significant, although the difference from management remains significant.) When the proportion of doctoral faculty publishing a major article is considered, the differences among finance, management, and marketing are not significant for the Trieschmann set of journals, although they are significant for some other journal sets. Across all journal sets, I find that accounting has a statistically significant lower proportion of AACSB doctoral faculty publishing a major article than the other three disciplines. To provide an overall idea of the magnitude, the proportion of doctoral faculty in the other three disciplines publishing a major article is 1.8 times greater than in accounting (with this average calculated over all four journal groups). Finding significant interdisciplinary differences in article counts and in the proportion of AACSB faculty publishing a major article is consistent with the predictions of *q-r* theory.

I also report on changes within each discipline over the 20 years to determine whether expectations for research output should be time-period-specific. Because the number of business faculty has grown considerably over the 1980–99 period (see Figure 1), a reasonable expectation is that demand for article slots has increased and this higher demand would result in more articles being published. However, if quality demands have increased over time as predicted by *q-r* theory, the number of published articles may not have increased. More precisely, *q-r* theory indicates that the number of published articles would remain steady if editors intervened to accept enough articles to fill journal slots, or would even decline if editors seldom intervened.

First, I regress annual article counts over the 20 years on a variable for time. A positive (negative) coefficient on the time variable for a discipline would indicate an increase (decrease) in articles published over the 1980–99 period. I find that the time coefficients are either insignificant or significantly negative depending on the set of journals.[3] Considering that the number of faculty grew considerably over this period, it is likely that the upward drift in quality norms predicted by *q-r* theory has limited the output of articles in the major journals. The magnitude of the temporal change in the proportion of faculty who published in a major journal is difficult to quantify precisely, however, because of changes in the response rate to the AACSB survey.[4]

My findings have important ramifications for the promotion and tenure process. Most important, accounting candidates will have difficulty producing the same quantity of major journal publications as produced by candidates in other disciplines. Decision makers should, therefore, weight articles on the basis of the business discipline or allow the number of major journals to vary by discipline. The proportion of faculty publishing in a major journal is not significantly different with two top-tier journals for finance, three for marketing, and four for management. Even with four journals, however, accounting publishes substantially fewer articles per doctoral faculty member than the other three disciplines. One possible response is to allow a fifth major journal for accounting. Alternatively, the most highly ranked journal in an accounting faculty member's primary area of research interest (that is, finance, managerial, auditing, systems, or tax) could be treated as a fifth major journal.[5] A second implication is that candidates in marketing and, to a lesser extent, in the other business disciplines are unlikely to publish in the major journals at a rate equivalent to that at which colleagues published in earlier time periods.

This paper also has important implications for editors and reviewers in accounting. The publication disparity supports an increase in articles published by the major accounting journals to levels more similar to other business disciplines. *Q-r* theory indicates that this outcome will require that editors actively intervene in the review process to accept articles that reviewers would otherwise reject. In commenting on reviewer influence in accounting, Demski and Zimmerman (2000, 350) argue that accounting papers are being overrefereed and suggest that doubters randomly select 10 papers from recent journals and find the referees' footprints. If accounting editors simply accept reviewer recommendations, such high levels of

r-quality are likely to be demanded by referees that article output will not increase. Accounting editors could also increase output by expanding the range of ideas investigated. Ellison (2002a) states that if an academic community emphasizes q-quality, authors will spend most of their time developing ideas. If r-quality is emphasized, researchers will react by spending less time developing new insights and more time padding and polishing papers on a limited set of ideas. In his 2001 AAA presidential address, Demski was critical of the state of idea development in accounting journals: "But we struggle with intertemporal sameness, with incremental as opposed to discontinuous attempts to move our thinking forward, and with referee intrusion and voyeurism" (Demski 2001, 1). These statements suggest that accounting is underinvesting in q-quality, and the accounting academic community should take steps to remedy this situation.[6]

The paper is organized as follows. Section 2 provides a more detailed summary of q-r theory. Section 3 describes the design of the study, including reasons for selecting accounting, finance, management, and marketing; the journals designated as "majors" in each of those disciplines; the characteristics of the AACSB doctoral faculty survey; and the data collection procedures. Section 4 presents empirical results on article output, and an extension to consider changes in co-authorship over time. In sections 5 and 6, I provide additional discussion of the implications of the study and suggest directions for future research.

2. The q-r model of the review process

As discussed in the introduction, the central premise of q-r theory is that referees and editors consider two aspects of paper quality (Ellison 2002a). The first quality characteristic is the inherent importance and interest of the main ideas of the paper, referred to as q-quality. The second, referred to as r-quality, reflects various other aspects of quality. These include a polished exposition, clear relationship to other papers, robustness tests for empirical results, and extensions to consider related questions. A crucial assumption of the model is that initial work on a paper determines its q-quality and subsequent revisions improve only r-quality (Ellison 2002a, 995). In the real world, there are obviously many dimensions of quality, and one can think of q and r in any way that is consistent with this timing assumption. For example, q can be thought of as the main contribution of the paper and r as the execution of the paper.

Ellison first uses a static equilibrium model in which an arbitrary social norm determines how q and r are weighted. Under the (α, z) social norm, papers are published if and only if $\alpha q + (1 - \alpha)r \geq z$. The parameter α reflects different value judgements on the relative importance of q and r, and z represents the overall quality level. Papers with higher q-quality are held to a lower standard of r-quality. Most of the analysis considers the required level of r for a given level of q. As α decreases, more emphasis is placed on r-quality relative to q-quality (and vice versa). In addition to capturing what referees think makes a paper valuable, the α weight can reflect what referees think authors should be required to do. For example, referees may require even high q-quality papers to make considerable r improvements in order to be like other published papers.

Authors are assumed to extensively revise papers in an attempt to provide the required *r*-quality. For papers with the highest *q*-quality, authors will be able to meet the required *r*-quality, so those papers are accepted. Papers with intermediate *q*-quality are revised to the greatest extent possible, but only some reach the total quality level required for acceptance. Papers with the lowest *q*-quality are of such little interest that no feasible revision could make them acceptable. These papers are not revised. The "marginal" rejected papers have relatively low *q*-quality relative to the accepted papers, although they have high *r*-quality. An interesting insight is that, among accepted papers, those with intermediate *q*-quality that meet the standard for publication would have the highest *r*-quality.

Under the static equilibrium model, a continuum of social norms that specify the required levels of *q* and *r* quality are possible and nothing precludes extremes. If an academic community emphasizes *q*-quality, authors will spend most of their time developing ideas. If *r*-quality is emphasized, researchers will react by spending less time developing new insights and more time padding and polishing papers. While existing reviewing norms are likely to fall between the extremes, an important objective of the model is to explain why there has been a trend toward higher *r*-quality.

Ellison (2002a) does this by introducing a dynamic learning model in which referees try to discover the social norms used in evaluating papers. Referees learn the prevailing norm from two sources: (1) observations of what revisions referees as authors are asked to make and whether their own papers are accepted or rejected, and (2) observations of whether editors eventually decide to accept or reject papers they have refereed. To keep the model tractable, Ellison invokes word-of-mouth communication so that each academic talks to every other academic and, thereby, sees all the data points.[7] The introduction of learning into the model allows changes in the reviewing standard over time. Note that referees are the driving force in the model, which Ellison notes is consistent with often-heard comments by editors that they abhor the trend toward longer papers with myriad extensions.

As referees attempt to learn the reviewing standard, what psychologists refer to as "overconfidence bias" leads to evolutionary change to require higher *r*-quality over time. Authors receive critical reviews of their own research, and most of the demands involve raising *r*-quality to the level required for publication. Because authors overrate the quality of their own research (due to overconfidence bias), they believe that the publication standard (that is, an arbitrary social norm) is higher than they thought. Authors then apply this higher standard when they act as reviewers. Under the model, referees perpetually try to hold authors to a standard that is slightly too high.[8] Referees often demand higher *r*-quality, and this causes the length of the review process to increase gradually. Only small, gradual changes to the basic dynamic model are needed. Ellison (2002a, b) presents empirical data that document an increase in the length of the review process in economics and several other social science disciplines (including accounting and finance).

The model predicts that the arbitrary social norm adopted by reviewers will tend to evolve toward an extreme at which the level of required quality becomes so

high that journal slots would not be filled. At this point, Ellison assumes that editors intervene to accept some papers that referees think should be rejected. Those surprise acceptances cause the reviewers to relearn the publication norm because it appears to be less demanding than they thought. Significantly, referees may also believe that *r*-quality is more important than they had thought, because the surprise acceptances tend to be at the low end of the *q* distribution and at the high end of the *r* distribution.

An implication of the *q*-*r* model is that, if editors seldom intervene, the number of articles that are published would decline as the norm for *r*-quality moves toward an extreme (with a corresponding increase in *z*). Instead of assuming editor intervention in order to fill journal slots, I assume that editors are reluctant to overrule reviewers.[9] This reluctance occurs for two reasons. First, editors depend on referee cooperation to evaluate papers, because journals do not pay their reviewers or pay them only a small stipend. Second, editors do not want to impair their own academic reputations by appearing to have lower standards than the currently perceived norm. The editors' reluctance to overrule allows referees to increase demands for higher *r*-quality.[10] Those demands result in lower article output because many studies do not satisfy the higher level of *r*-quality required for acceptance. In addition, researchers are required to spend so much time meeting very high *r*-quality standards that they are able to complete fewer papers, and this further reduces the number of high-quality papers available to editors. A lower article output can exist for extensive periods of time, unless editors actively intervene to increase output. Note that, with a dynamic learning model, the process under study can be out of equilibrium for lengthy periods of time.[11]

In accord with *q*-*r* theory, widely different cultures for reviewing research can develop in the various disciplines because of the insular nature of the review process. That is, researchers seldom submit papers to journals outside their discipline, and the reviews they receive on their own papers tend to set the standards for the reviews they provide for other papers. Further, referees are seldom asked to evaluate papers outside their discipline. Finally, editors may intervene to a different extent in each discipline to fill journal slots.[12] Because quality standards are essentially arbitrary and a continuum of social norms is possible, different norms are likely to evolve in each discipline. Differences in norms are expected to lead to differences in the number of articles published and in the proportion of doctoral faculty who publish. *Q*-*r* theory, therefore, provides support for the following alternative hypotheses:

HYPOTHESIS 1(a). *Differences exist in the number of articles published in the major journals for accounting, finance, management, and marketing.*

HYPOTHESIS 1(b). *Differences exist in the proportion of faculty who published in the major journals for accounting, finance, management, and marketing.*

Because the number of doctoral faculty has increased substantially over the 1980–99 period, more faculty are competing for major journal publications. If

quality norms have remained constant, the number of articles published would increase. However, *q-r* theory indicates that the norms applied within a discipline are likely to become more demanding over time, with the amount depending on how actively editors intervene to fill journal slots. *Q-r* theory, therefore, supports the following alternative hypotheses:

HYPOTHESIS 2(a). *A decrease or no change occurred in the number of articles published in the major journals over the 1980–99 period within accounting, finance, management, and marketing.*

HYPOTHESIS 2(b). *A decrease occurred in the proportion of faculty who published in the major journals over the 1980–99 period within accounting, finance, management, and marketing.*

For Hypotheses 1(a) and 1(b), ex ante directional differences are not predicted among the disciplines because I would need measures of *q*-quality and *r*-quality that are comparable across the disciplines. This is beyond the intended scope of the paper.[13] For Hypothesis 2(a), no change would occur in the number of articles published if editors intervene to fill journal slots, as assumed in the original formulation of *q-r* theory by Ellison 2002a. If editors seldom intervene (for reasons discussed previously), a decline in articles published could occur because referees would be free to demand higher *r*-quality. The third possibility, an increase in articles published, would provide evidence contrary to the prediction of increasing quality norms over time. For Hypothesis 2(b), a decline in the proportion of faculty who published in the major journals is predicted because of the growth in the number of doctoral faculty over 1980–99. That is, even if the number of article slots is constant over time, more faculty members are competing to publish.

3. Choice of business disciplines, major journals, and productivity measures

This study requires data on the number of research articles, authors, and doctoral faculty in each discipline for each year from 1980 to 1999. Article and author data were hand-collected from journals (and checked extensively for accuracy).[14] Research articles comprise main articles, articles in a special-topic section, and shorter articles (including research notes). Discussant comments and replies, memorials, and articles in an education section are omitted.[15]

Data on the number of doctoral faculty were obtained directly from the AACSB and used to calculate a scaled productivity measure (discussed below). Accounting, finance, and marketing are among the 13 distinct discipline categories used by the AACSB. These three disciplines are separate departments in most business schools, so the faculty data correspond to a common decision-making unit for promotion and tenure decisions. The fourth discipline chosen for study, management, comprises three AACSB categories: (1) corporate strategy/business policy/business and society, (2) human resource management, and (3) management/organizational behavior. This composition corresponds to the composition in Trieschmann et al. 2000, which in turn references other studies that have used faculty counts from this combination of AACSB management fields.

By considering only these four business disciplines, I omitted seven AACSB categories. I excluded economics because it is usually not part of the business school. Six other AACSB categories are omitted because they are not included in business school departments in a consistent manner. They also tend to be much smaller and/or specialized disciplines, and much less agreement exists about which journals are the most prestigious. The excluded disciplines are insurance, international business, management information systems, management science/operations research, production/operations management, and real estate.

Studies that rank journals generally use either citation analysis or surveys of faculty and administrator opinions. Considerable agreement exists about the most prestigious journals in accounting, finance, and marketing. Journal selection for management is more problematic because, as discussed above, it includes several diverse subdisciplines. To add objectivity and increase the linkage to prior research on publication productivity, I use a base reference set of top-tier journals that is identical to the journals used by Trieschmann et al. 2000 (1132–33), who state: "We attempted to obtain the same relative number of journals in each discipline group as there were faculty members in that group across AACSB-member schools."[16] This criterion results in a different number of journals for each discipline. While this criterion seems reasonable, its implementation is questionable. Trieschmann et al. allowed management, which has the largest number of doctoral faculty, to have four journals, and accounting, which is slightly smaller, to have three journals. Marketing, which is much smaller than accounting, is also allowed three journals. Finance is allowed only two journals, despite being about the same size as marketing.[17] (See Table 1 for the specific journals and Figure 1 for the number of AACSB faculty in each discipline.)

Because the number of major journals can affect interdisciplinary comparisons of article output, I consider three modifications to the set used by Trieschmann et al. 2000. The decision to allow four journals for management but only two for finance is likely to be contentious. As a result, group 2 includes the *Journal of Financial and Quantitative Analysis* as a third finance journal, following rankings by Alexander and Mabry 1994 and Corrado and Ferris 1997.[18] This group also reduces the number of management journals from four to three, so each discipline has three journals. The *Journal of Strategic Management* is omitted because it primarily serves the subset of management faculty involved in strategy. Group 3 allocates four journals to both accounting and management and three to finance and marketing. As is evident from Figure 1, this allocation reflects more accurately than group 1 the Trieschmann et al. 2000 criterion of having the number of major journals correspond to the number of AACSB faculty. The fourth major journal for accounting is *Contemporary Accounting Research* (*CAR*), following the rankings in Brown and Huefner 1994, Barniv and Fetyko 2001, and Ballas and Theoharakis 2003.[19] Group 4 attempts to equalize the proportion of faculty publishing a major article in each discipline without introducing additional journals. This results in four journals for accounting and management, three for marketing, and two for finance.

As mentioned previously, I provide two types of productivity measures: (1) simple counts of articles published and (2) a scaled productivity metric calculated

as the ratio of authors published in a discipline each year to the number of AACSB doctoral faculty in the discipline that year. This ratio is analogous to hazard rates used in event history analysis.[20] The AACSB doctoral faculty numbers are based on responses to a survey sent to U.S. member schools each year, and the faculty totals are simple sums from the surveys received.[21] The number of U.S. member schools has grown only modestly over the 1980–99 period (roughly 10 percent), so the population sampled is reasonably stable. The population excludes schools

TABLE 1
Journals classified as a "major" for each business discipline*

	Group 1	Group 2	Group 3	Group 4
Accounting				
Journal of Accounting & Economics (5)	✓	✓	✓	✓
Journal of Accounting Research (3)	✓	✓	✓	✓
The Accounting Review (4)	✓	✓	✓	✓
Contemporary Accounting Research (4)			✓	✓
Finance				
The Journal of Finance (6)	✓	✓	✓	✓
Journal of Financial Economics (12)	✓	✓	✓	✓
Journal of Financial and Quantitative Analysis (4)		✓	✓	
Management				
Academy of Management Journal (6)	✓	✓	✓	✓
Academy of Management Review (4)	✓	✓	✓	✓
Administrative Sciences Quarterly (4)	✓	✓	✓	✓
Strategic Management Journal (12)	✓		✓	✓
Marketing				
Journal of Marketing (4)	✓	✓	✓	✓
Journal of Marketing Research (4)	✓	✓	✓	✓
Journal of Consumer Research (4)	✓	✓	✓	✓

Notes:

* The number of issues in 1999 is given in parentheses.

Group 1 = the set of major journals used in a recent *Academy of Management Journal* study by Trieschmann, Dennis, Northcraft, and Niemi 2000 that ranks both business schools and their individual departments.

Group 2 = modification of group 1 to have an equal number of major journals per discipline.

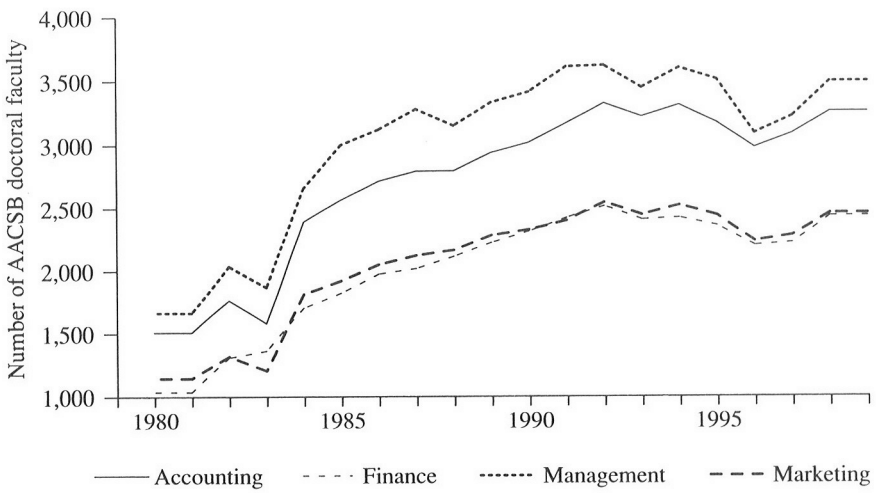
Group 3 = modification of group 1 to have the number of major journals correspond to the number of faculty in each discipline per the annual AACSB survey (see Figure 1).

Group 4 = modification of group 1 to produce a similar proportion of faculty publishing a major article in each discipline with a maximum of four majors in any discipline (see Figure 1).

without any research mission, because some research is required for AACSB accreditation. About two-thirds of the member schools respond each year (an average of 420 schools) and, according to AACSB staff, smaller, less research-oriented schools are less likely to complete the survey. The AACSB doctoral faculty data are well suited for scaling the number of authors for differences in discipline size because each responding school reports the number of doctoral faculty in its accounting, finance, management, and marketing departments.[22]

The AACSB data are not as well suited for temporal comparisons because the number of schools completing the survey varies somewhat by year. Most important, the number of survey respondents is about one-third lower in years prior to 1984 (for reasons unknown), so the large increase in doctoral faculty in 1984 is due, in part, to a higher survey response rate (see Figure 1). As a result, when using proportions to test Hypothesis 2, results using only data from 1984 to 1999 will also be discussed.

Figure 1 Number of doctoral-level faculty positions filled by year (data from annual AACSB survey)*



Note:

* The doctoral faculty numbers are based on responses to an annual survey by the Association to Advance Collegiate Schools of Business (AACSB), and the faculty totals are simple sums from the surveys received. About two-thirds of the member schools respond each year (an average of 420 schools). The lower faculty counts for 1980–83 are due, in part, to a lower response rate to the survey. The AACSB doctoral faculty data are well suited for scaling the number of authors to adjust for differences in discipline size because each responding school reports the number of doctoral faculty in its accounting, finance, management, and marketing departments.

Deflation by the number of AACSB doctoral faculty can be viewed simply as a way to adjust for discipline size (similar to deflation by total assets, sales, or market price in many archival-financial studies). However, interdisciplinary comparisons of proportions can be used to measure the relative extent of competition to publish a major article under some fairly restrictive conditions. The conditions are that faculty in accounting, finance, management, and marketing have an equal interest in academic research, an equally rich set of researchable problems, equivalent research skills, and a comparable level of research support. Because these conditions are unlikely to be strictly met in practice, examining the proportion of faculty publishing a major article provides a reasonable, but inexact, measure of competition. While readers should keep this caveat in mind, many of the empirical differences reported in the next section, especially between accounting and other disciplines, are sufficiently sizable to support an interpretation that cross-disciplinary differences exist in competition.

The number of articles published relative to papers submitted (that is, acceptance rates) is an alternative measure of competition. However, this measure is endogenous to the level of competition because fewer articles will be submitted to the major journals if competition is very high. That is, a low number of submissions could indicate that competition is so high, and publishing is therefore so difficult, that many potential researchers have made a rational choice not to compete. Under this scenario, a low number of submissions would result in a higher acceptance rate, despite extensive competition.[23] High competition in a discipline's major journals could also lead to the formation of new journals, and those additional journals could further reduce the number of submissions at the majors. Two pragmatic reasons also increase the difficulty of using acceptance rates. First, some of the journals in this study do not report the number of submissions (for example, *Journal of Accounting Research*). Second, because acceptance rates are calculated at the journal level, discipline-level acceptance rates would require a procedure to remove multiple submissions of the same paper.

4. Empirical results

Interdisciplinary comparisons of average publication output over 1980–99

Article counts

One-way analysis of variance (ANOVA) is used to test whether the average number of articles published per year in the major journals over the 1980–99 period is statistically different among the four disciplines. As reported in panel A of Table 2, for all four groups of journals, F-values indicate that at least one discipline is different (at the 0.001 significance level). This provides support for the alternative form of Hypothesis 1(a) (that is, a significant difference exists among disciplines when research output is measured by article counts).

Management with 170 articles has the highest annual average for groups 1, 3, and 4 (when management is allowed four major journals). The paired comparisons for these same groups in panel B of Table 2 show that the management average exceeds the averages for accounting, finance, and marketing by a statistically

significant amount. For group 2, in which each discipline is allowed three major journals, finance publishes the most articles with 156, and the paired comparisons of finance with the other three disciplines are statistically significant.

Accounting publishes the fewest articles at 89 per year when accounting has three major journals (groups 1 and 2), and panel B of Table 2 shows that the differences between accounting and each of the other disciplines are statistically significant. When accounting has four major journals (groups 3 and 4), the annual average of 113 is significantly less than the average of 170 by management but not signifi-

TABLE 2
Average number of research articles published in a major journal per year over 1980–99

Panel A: Mean articles (number of major journals) for four groups of top-tier journals with results for one-way ANOVA*

Discipline	Group 1	Group 2	Group 3	Group 4
Accounting	89 (3)	89 (3)	113 (4)	113 (4)
Finance	120 (2)	156 (3)	156 (3)	120 (2)
Management	170 (4)	123 (3)	170 (4)	170 (4)
Marketing	119 (3)	119 (3)	119 (3)	119 (3)
Observations	80	80	80	80
Model *F*-value	103.21	52.96	60.73	52.73
Significance	0.001	0.001	0.001	0.001

Panel B: Paired comparisons of differences between mean articles in each discipline†

Discipline	Group 1	Group 2	Group 3	Group 4
Accounting–finance	−31‡	−67‡	−43‡	−7
Accounting–management	−81‡	−34‡	−57‡	−57‡
Accounting–marketing	−30‡	−30‡	−6	−6
Finance–accounting	31‡	67‡	43‡	7
Finance–management	−50‡	34‡	−14#	−50‡
Finance–marketing	1	37‡	37‡	1
Management–accounting	81‡	34‡	57‡	57‡
Management–finance	50‡	−34‡	14#	50‡
Management–marketing	51‡	4	51‡	51‡
Marketing–accounting	30‡	30‡	6	6
Marketing–finance	−1	−37‡	−37‡	−1
Marketing–management	−51‡	−4	−51‡	−51‡
Levine statistic	1.05	4.01§	1.93	1.13
Comparison test	Scheffe	Games-Howell	Scheffe	Scheffe

(The table is continued on the next page.)

TABLE 2 (Continued)

Notes:

* The journals that comprise the four groups of majors are summarized in Table 1. Research articles comprise main articles, articles in a special-topic section, and shorter articles (including research notes). Discussant comments and replies, memorials, and articles in an education section are omitted.

† For the paired comparisons, statistical significance is determined using the Scheffe test when homogeneity among the variances for the four disciplines cannot be rejected (that is, Levine test is not statistically significant). Otherwise, the Games-Howell test is used.

‡ Significant at the 0.001 level (two-tailed).

§ Significant at the 0.01 level (two-tailed).

Significant at the 0.10 level (two-tailed).

cantly less than the marketing average of 119. The difference from finance depends on the journal group. Accounting publishes significantly less for the group 3 comparison when finance has three majors, which publish an average of 156 articles. For group 4, when finance has two majors that publish an average of 120 articles, the difference between accounting and finance is not significant.

The statistical analyses were also run for two subperiods, 1980–89 and 1990–99, but not tabulated. The same differences are statistically significant in 1990–99 as those reported in Table 2. Because marketing published more articles over 1980–89 than over 1990–99 (as discussed subsequently), the insignificant difference with accounting for journal groups 3 and 4 is significantly negative for 1980–89, indicating that accounting published fewer articles.

Proportion of doctoral faculty who published

Table 3, panel A reports the average annual ratio of authors of an article in a major journal to AACSB doctoral faculty over the 1980–99 period for each discipline. One-way ANOVA is again used to test whether at least one of the proportions is statistically different among the four disciplines. For all four groups of journals, F-values indicate that at least one discipline is different (at the 0.001 significance level). This provides support for the alternative form of Hypothesis 1(b) (that is, a significant difference exists among disciplines when research output is measured as the proportion of AACSB faculty publishing in a major journal).

To determine which of the differences are statistically significant, panel B of Table 3 reports paired comparisons. The most frequent and substantial differences occur for accounting, where the proportion of doctoral faculty who published is significantly lower than in finance, management, or marketing across all four journal groups. The magnitude of the differences are sizable. On average, the proportion of doctoral faculty in the other three disciplines publishing an article in a major journal is 1.9, 2, 1.7, and 1.6 times greater than accounting for groups 1, 2, 3, and 4, respectively.[24] Across the four journal groups, the overall average is 1.8.

Whether differences exist among the other three disciplines depends on the journal set. For the group 1 set of journals used by Trieschmann et al. 2000, the proportions for finance, management, and marketing are not significantly different. In contrast, for groups 2 and 3 (when finance is allowed three major journals), the proportion of finance faculty publishing in a major journal exceeds that for management (but not marketing) by a statistically significant amount. In order to minimize differences in the proportions across disciplines, group 4 adopts the journal set used in

TABLE 3
Average proportion of AACSB doctoral faculty publishing a research article in a major journal over 1980–99

Panel A: Mean proportions (number of major journals) for four groups of top-tier journals with results for one-way ANOVA*

Discipline	Group 1	Group 2	Group 3	Group 4
Accounting	0.062 (3)	0.062 (3)	0.075 (4)	0.075 (4)
Finance	0.115 (2)	0.149 (3)	0.149 (3)	0.115 (2)
Management	0.113 (4)	0.086(3)	0.113 (4)	0.113 (4)
Marketing	0.130 (3)	0.130 (3)	0.130 (3)	0.130 (3)
Observations	80	80	80	80
Model F-value	13.03	19.18	12.51	8.32
Significance	0.001	0.001	0.001	0.001

Panel B: Paired comparisons of differences between mean proportions in each discipline†

Discipline	Group 1	Group 2	Group 3	Group 4
Accounting–finance	−0.053‡	−0.087‡	−0.074‡	−0.040‡
Accounting–management	−0.051‡	−0.023**	−0.038‡	−0.038‡
Accounting–marketing	−0.067‡	−0.067‡	−0.054‡	−0.054‡
Finance–accounting	0.053‡	0.087‡	0.074‡	0.040‡
Finance–management	0.002	0.062‡	0.036#	0.002
Finance–marketing	−0.015	0.019	0.019	−0.015
Management–accounting	0.051‡	0.023**	0.038‡	0.038‡
Management–finance	−0.002	−0.063‡	−0.036#	−0.002
Management–marketing	−0.017	−0.044#	−0.017	−0.017
Marketing–accounting	0.067‡	0.067‡	0.054‡	0.054‡
Marketing–finance	0.015	−0.019	−0.019	0.015
Marketing–management	0.017	0.044#	0.017	0.017
Levine statistic	4.81§	3.86§	5.57§	6.45‡
Comparison test	Games-Howell	Games-Howell	Games-Howell	Games-Howell

(The table is continued on the next page.)

TABLE 3 (Continued)

Notes:

* The journals that comprise the four groups of majors are summarized on Table 1. Research articles comprise main articles, articles in a special-topic section, and shorter articles (including research notes). Discussant comments and replies, memorials, and articles in an education section are omitted. The proportion of faculty publishing an article in a major journal is calculated annually by dividing the total number of authors by the total number of AACSB doctoral faculty in the discipline that year and then taking the average for the 20 years.

† For the paired comparisons, the Games-Howell test is used in all paired comparisons because the Levine test indicates that homogeneity of variances among the four disciplines can be rejected.

‡ Significant at the 0.001 level (two-tailed).

§ Significant at the 0.01 level (two-tailed).

\# Significant at the 0.05 level (two-tailed).

** Significant at the 0.10 level (two-tailed).

group 1 for finance, management, and marketing (so the proportions for these disciplines are not significantly different). Accounting differs from group 1 in having four major journals. Nevertheless, the proportion of faculty able to publish a major article in the other three disciplines is still 1.6 times greater than in accounting (as reported above).

The statistical analyses were also run for the two subperiods, 1980–89 and 1990–99, but not tabulated. For 1990–99, the only comparison that changes from those reported in Table 2 is that finance has a significantly higher proportion of faculty publishing than marketing for groups 2 and 3. For 1980–89, all the comparisons are substantively the same.

To summarize the two tests for Hypothesis 1, the overall finding is that significant differences exist among business disciplines, both in the average number of articles published (Table 2) and in the average proportion of AACSB doctoral faculty who published in a major journal (Table 3).

Changes in publication output over the 1980–99 period

Changes in article counts over time

As discussed in the introduction, an important issue for promotion and tenure is whether expectations for research output should vary by time period. Table 4 presents regressions with the number of articles published each year from 1980 to 1999 as the dependent variable. The independent variable is time, which is ordered from 1 to 20 (which corresponds to 1980–99). Separate regressions were run by discipline for each of the seven indicated sets of journals. Table 4 is organized differently from Tables 2 and 3 because Hypothesis 2(a) concerns changes in publication

output within disciplines, rather than comparisons across disciplines. The four columns on the left-hand side of the table facilitate comparison with the journal groups used in prior tables to compare results across disciplines.

TABLE 4
Regression of number of articles published per year on time*

Journal group								
1	2	3	4	Discipline	*Time*	*Intercept*	Model *F*-value	Adj. R^2
				Accounting				
✓	✓			*JAE, JAR, TAR*	−0.93	98.71	3.41‡	0.112
					(−1.85)§	(16.28)†		
		✓	✓	*CAR, JAE, JAR, TAR*	0.71	105.31	0.87	−0.007
					(0.93)	(11.55)†		
				Finance				
✓			✓	*JF, JFE*	0.46	115.46	0.72	−0.015
					(0.85)	(17.89)†		
	✓	✓		*JF, JFE, JFQA*	−0.72	163.74	2.45	0.071
					(−1.57)	(29.63)†		
				Management				
	✓			*AMJ, AMR, ASQ*	−2.49	148.81	14.97†	0.424
					(−3.87)†	(19.30)†		
✓		✓	✓	*AMJ, AMR, ASQ, SMJ*	0.12	168.58	0.06	−0.052
					(0.24)	(27.27)†		
				Marketing				
✓	✓	✓	✓	*JM, JMR, JCR*	−2.71	147.45	71.02†	0.787
					(−8.43)†	(38.35)†		

Notes:

* The dependent variable consists of the sum of research articles published in each year from 1980 to 1999 for the indicated journals. Time is measured by an ordered variable from 1 to 20, representing the years from 1980 to 1999. The journal groups correspond to Table 1. Accounting: *CAR* (*Contemporary Accounting Research*), *JAE* (*Journal of Accounting & Economics*), *JAR* (*Journal of Accounting Research*), and *TAR* (*The Accounting Review*). Finance: *JF* (*The Journal of Finance*), *JFE* (*Journal of Financial Economics*), and *JFQA* (*Journal of Financial and Quantitative Analysis*). Management: *AMJ* (*Academy of Management Journal*), *AMR* (*Academy of Management Review*), *ASQ* (*Administrative Sciences Quarterly*), and *SMJ* (*Strategic Management Journal*). Marketing: *JM* (*Journal of Marketing*), *JMR* (*Journal of Marketing Research*), and *JCR* (*Journal of Consumer Research*).

† Significant at the 0.001 level (two-tailed).

‡ Significant at the 0.05 level (two-tailed).

§ Significant at the 0.10 level (two-tailed).

The results support the alternative form of Hypothesis 2(a). The time variable is significantly negative in three of the seven regressions and insignificant in the other four regressions. The explanation provided by *q-r* theory is that editors seldom intervened to fill article slots for the groups of journals with a significant negative coefficient, so quality norms were allowed to increase substantially. These journals appear to have unused capacity. For the four journal sets with an insignificant coefficient, the theory suggests that editors intervened to fill journal slots, as assumed in the original formulation of *q-r* theory by Ellison 2002a. Importantly, evidence contrary to *q-r* theory — namely, a significant increase in articles published — did not occur for any of the seven sets of journals.

Figure 2 displays the number of articles published for each year from 1980 to 1999. In panel A, which provides a line graph for the group 1 set of journals used by Trieschmann et al. 2000, management publishes the most articles in every year. For both management and finance, the amounts vary by year but do not show a linear pattern of increasing or decreasing, which is consistent with the insignificant time variables reported in Table 4 for the group 1 journals. Marketing began the period publishing substantially more articles than finance, but then experienced a sizable, and steady, decline in published articles over the two decades. As reported in Table 4, the decline averages 2.71 articles per year (significant with a *t*-value of −8.43).[25]

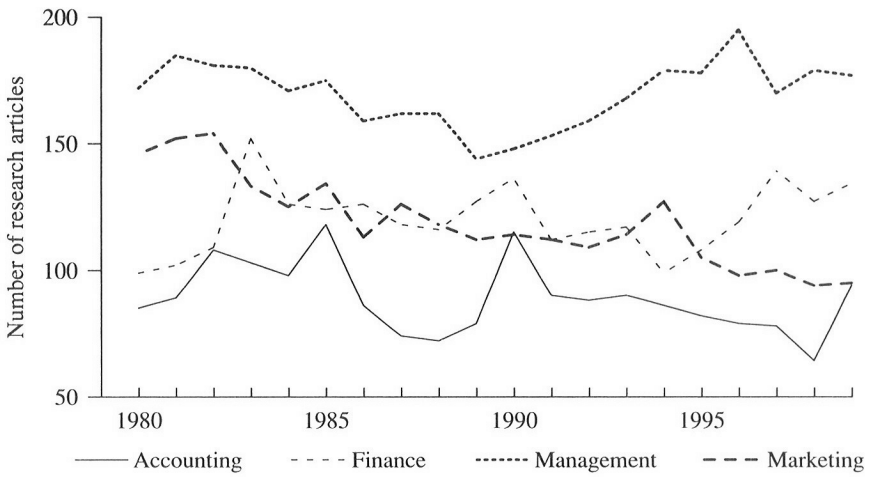
Accounting published substantially fewer articles in its major journals than did the other disciplines in most years. (The number of accounting articles tends to vary more than the number of articles in other disciplines as a result of occasional conferences held by the *Journal of Accounting and Economics*.) Despite publishing fewer articles than the other disciplines at the beginning of the period, accounting reduced article output over the sample period by almost one article per year for the journals used in group 1 (that is, −0.93 significant with a *t*-value −1.85, per Table 4). Because previous comparisons of articles published indicate a need for at least four major journals for accounting, panel B of Figure 2 includes *Contemporary Accounting Research* (with the same journals from panel A for the other disciplines). Beginning with 1985, the number of articles published in accounting now appears similar to finance and marketing, although management still publishes substantially more articles. The time variable reported in Table 4 for the accounting journals in group 4 is not significant; however, this result is not surprising because *CAR* began in 1984 with one issue, and added a second issue in 1985, and eventually increased to four issues.

Changes in the proportion of faculty publishing over time

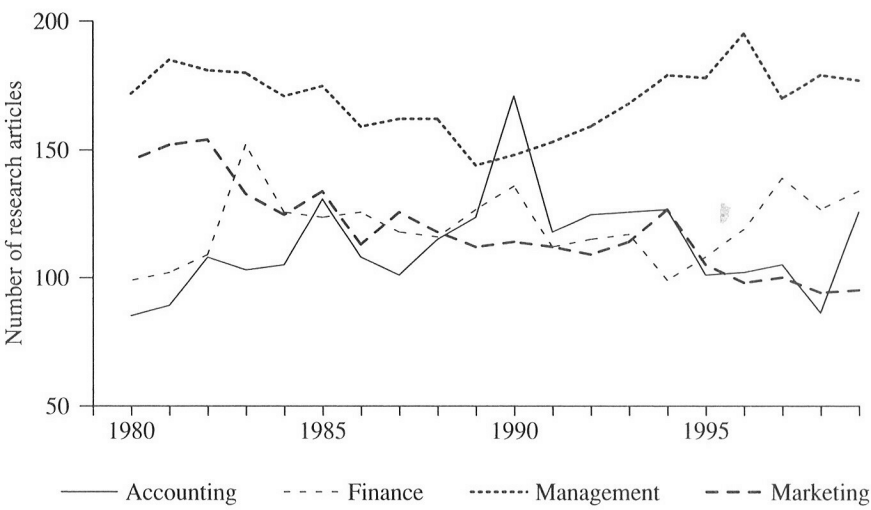
As discussed previously, Figure 1 reports the number of doctoral faculty positions filled in each of the four business disciplines based on responses to the annual survey conducted by the AACSB. Recall that the steep slope from 1980 to 1984 is caused by a combination of faculty growth and a higher response rate to the AACSB survey beginning with 1984. Although the exact amount of growth is difficult to determine, there is no question that the number of doctoral AACSB faculty grew considerably from 1980 to 1999. The number of faculty peaked in the 1992–93 academic year for each discipline, and the lines for each of the four disciplines

Figure 2 Comparative counts of articles published in the major journals of each business discipline

Panel A: Group 1 journals (*JAE*, *JAR*, and *TAR* for accounting)*



Panel B: Group 4 journals (*CAR*, *JAE*, *JAR*, and *TAR* for accounting)*



Note:

* The journals that comprise the group 1 and group 4 majors are summarized in Table 1. Research articles comprise main articles, special-topic articles, and shorter articles (including research notes). Discussant comments and replies, memorials, and articles in an education section are omitted.

follow similar patterns of growth over time, which would be expected because they service the same group of students. Over the entire 20 years, management is the largest discipline, followed closely by accounting. Those two disciplines are substantially larger than finance and marketing, which are of similar size.

Separate regressions were run for each set of journals with the proportion of faculty who published an article in a major journal each year from 1980 to 1999 as the dependent variable. The independent variable is time ordered from 1 to 20. When the models were run over 1980–99, the time variable was negative and significant in every case (untabulated). The model was rerun excluding the years prior to 1984 because, as discussed above, an unknown portion of the faculty growth in Figure 1 is due to a higher response rate to the AACSB faculty survey. Time is then measured as an ordered variable from 1 to 16. The time variable remains significantly negative in the following three regressions (untabulated): accounting (for *JAE*, *JAR*, and *TAR*), finance (for *JF*, *JFE*, and *JFQA*), and marketing (for *JM*, *JMR*, and *JCR*). The loss of statistical significance in the other four journal sets is due both to reduction of statistical power from fewer observations and omission of years from the early 1980s with a substantial, but unknown amount of, doctoral faculty growth.

Figure 3, panel A displays the actual proportions for each year from 1980 to 1999 for the group 1 set of major journals. The effect of removing the 1980–83 years is apparent because much of the decrease in the proportion of faculty publishing occurs by the mid-1980s. Even without those years, however, the decline for marketing and accounting is statistically significant. The graph in panel B differs from panel A only in the inclusion of *CAR*. The accounting line is now relatively flat after 1986 and time is no longer significant. This occurs as a result of the inclusion of *CAR* beginning with 1984.

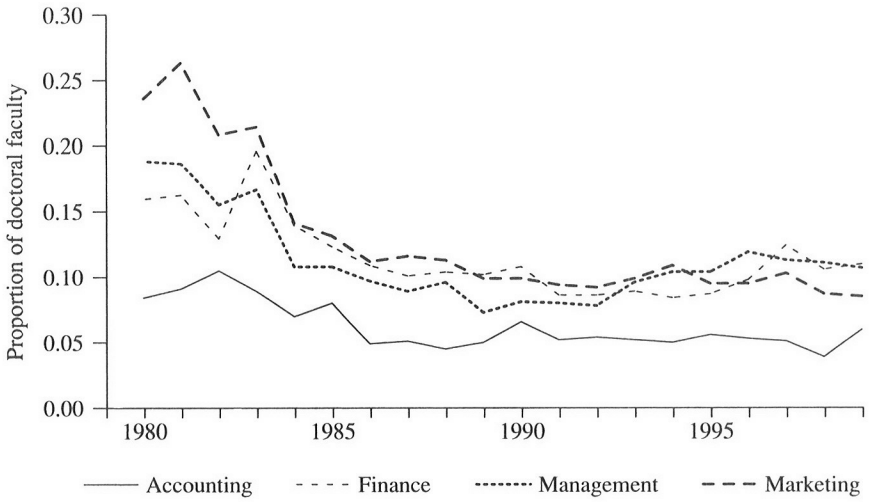
Comments on the possibility of fixed journal capacity

The insignificant coefficients on the time variables used to test Hypotheses 2(a) and 2(b) would result if journal capacity is fixed. I do not believe journal capacity is fixed, however. The major journals almost certainly can raise subscription prices in order to add issues or produce thicker issues. And even without increasing subscription prices, the growth in doctoral faculty over the 1980–99 period would raise revenues by increasing circulation. Another potential reason for fixed capacity is the difficulty of managing larger journals and maintaining quality. While this reason has some merit, one of the most highly respected major journals, *The Journal of Finance*, publishes about 80 articles per year. By comparison, most other major journals publish from 30 to 40 articles per year. For these reasons, the major journals appear to have the ability to increase article capacity.

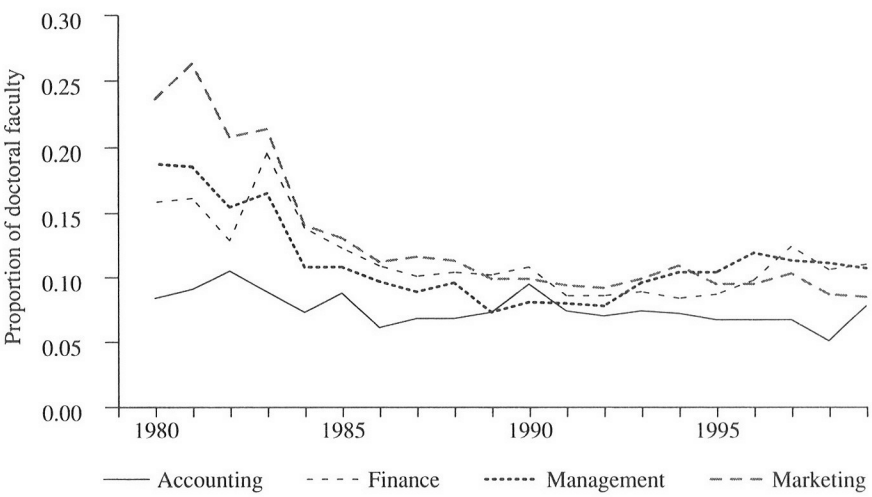
Direct evidence that the major journals can increase capacity is the fact that some increased the number of annual issues. In general, they did not use this capacity to publish more articles, and in some instances, the journals published fewer articles per year.[26] Further, among the journals publishing a constant number of issues over the 1980–99 period, the marketing journals and two accounting journals (*The Accounting Review* and the *Journal of Accounting Research*)

Figure 3 Proportion of faculty publishing an article in a major journal for each business discipline

Panel A: Group 1 journals (*JAE*, *JAR*, and *TAR* for accounting)*



Panel B: Group 4 journals (*CAR*, *JAE*, *JAR*, and *TAR* for accounting)*



Note:

* The journals that comprise the group 1 and group 4 majors are summarized in Table 1. Research articles comprise main articles, special-topic articles, and shorter articles (including research notes). Discussant comments and replies, memorials, and articles in an education section are omitted. The proportion of faculty publishing an article in a major journal is calculated annually by dividing the total number of authors by the total number of AACSB doctoral faculty in the discipline that year.

decreased the number of articles published. The existence of unused capacity suggests an explanation more complex than constraints on journal capacity. *Q-r* theory provides such an explanation.

Some indirect evidence about changes in competition

Co-authorship

Changes in co-authorship over the 1980–99 period provide indirect evidence about changes in the difficulty of publishing. If publishing a top-tier article has become more competitive over time, faculty would be expected to respond by working with more colleagues. The use of teams reduces the time spent by each individual, allows a blending of research skills, and enables researchers to reduce overall rejection risk (analogous to holding a portfolio of common stocks).[27]

The evidence is based on regressions with the annual average number of authors per article as the dependent variable. Consistent with an increase in the difficulty of publishing in a major journal, I find that the time variable is significantly positive at the 0.001 level in all four disciplines (across all four sets of journals). While the regression results are not tabulated, Figure 4 provides a visual presentation of changes in co-authorship for the group 4 journals. The upward slope for each discipline is evident. Concerning differences among the disciplines, marketing has a significantly higher rate of co-authorship than finance, management, or accounting.

5. Discussion of the findings

The *q-r* theory of the academic review process predicts that different quality norms for reviewing research evolve in each discipline and quality norms tend to become more demanding over time. Different quality norms can lead to a disparity in major journal output among disciplines, and more demanding norms can increase the difficulty of publishing a major over time. This study provides empirical evidence about differences in article output among disciplines and over time. Without evidence about such differences, the tendency is for business faculty to weight articles in the major journals similarly across disciplines and time periods.

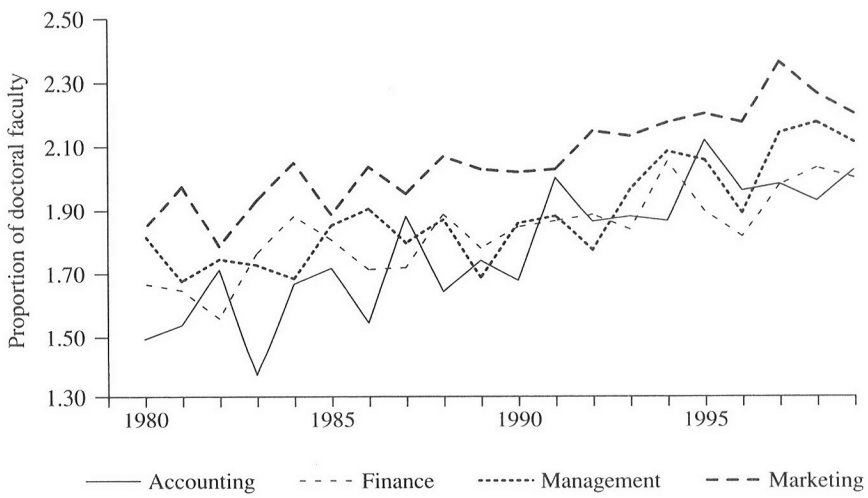
The empirical findings have direct implications for faculty and administrators involved in promotion and tenure decisions. Most important, sizable differences exist among business disciplines in the proportion of AACSB doctoral faculty publishing in the major journals. The magnitude of the differences is sufficient to indicate that publishing a major article in accounting is more competitive than publishing a major article in finance, management, and marketing (see Table 3 and Figure 3). To provide an overall measure of the magnitude, the proportion of doctoral faculty in the other three disciplines publishing a major article is 1.8 times greater than in accounting (averaged over the four journal groups in Table 1). This difference occurs because accounting tends to publish fewer articles in its major journals than the other disciplines (see Table 2 and Figure 2) and accounting has a relatively large number of doctoral faculty (see Figure 1).

The disparity in competition to publish in a major journal can be reduced by allowing each discipline to have a different number of major journals. Using the

proportion of faculty publishing to measure competition, journal group 4 (see Table 1) provides the greatest similarity among disciplines. Group 4 allows two major journals for finance, three for marketing, and four for both accounting and management. No statistically significant differences then exist among finance, management, and marketing (see Table 3). However, the proportion of doctoral faculty in those three disciplines publishing in a major journal is still 1.6 times greater than in accounting. Consideration should be given to allowing at least one additional major journal for accounting. Another possibility is to allow the most highly rated journal in an accounting faculty member's primary area of research interest (that is, finance, managerial, auditing, systems, or tax) to be treated as a major journal.

The intertemporal empirical findings show that, within each discipline, the number of published articles has remained steady or declined (see Table 4 and Figure 2), despite growth in the number of doctoral faculty (see Figure 1). The proportion of marketing faculty publishing in a major journal has declined significantly over time by 2.71 articles per year. The proportion of accounting faculty publishing has also declined significantly by almost one article per year for the Trieschmann set of journals, but the decline is not statistically significant when *Contemporary Accounting Research*, which began publishing in 1984, is included. Additional evidence of an increase in competition over the 1980–99 period is provided by an increase in the average number of co-authors in all four disciplines (see Figure 4).

Figure 4 Co-authorship of articles by discipline (for group 4 journals)*



Note:

* The journals that comprise the group 4 are summarized in Table 1. Co-authorship is calculated for each year by dividing the number of authors by the number of published articles.

The overall evidence indicates that candidates in all four business disciplines are likely to find it difficult to publish in major journals at a rate equivalent to that at which colleagues published in earlier time periods.

Another contribution of this paper is that it brings *q*-*r* theory to the academic business literature. Glenn Ellison of MIT developed the theory, and my contribution is to adapt it to explain why differences in publication output occur among business disciplines and over time (by removing the assumption that journal slots are filled). The framework provided by *q*-*r* theory has considerable educational value, particularly for less experienced researchers. The theory's description of the review process emphasizes the importance of the underlying idea. Innovative ideas not only increase the chances of article acceptance, they reduce the level of *r*-quality likely to be required for publication. The framework provided by *q*-*r* theory also provides insights for reviewing research. The theory encourages referees to explicitly evaluate the level of *q*-quality and then require additional *r*-quality conditional on the quality of the underlying idea. This two-step process could help referees resist the tendency to demand maximum levels of *r*-quality. Finally, the theory provides support for editor intervention into the review process, which is often needed to fill journal slots and to moderate referee demands for *r*-quality. In fact, the evidence in this paper indicates that additional intervention by editors in accounting is needed to increase publication output in the major accounting journals to levels more similar to those in the other business disciplines.

6. Future research and conclusion

Considering that many academics devote a large portion of their waking hours to research, the publication process has received surprisingly little study. A distinctive aspect of this study is the use of interdisciplinary comparisons, an approach that has considerable potential for additional research. One of the most important topics for future research is the *consequences* of the differences in major journal output among business disciplines. In particular, has the lower rate of major article publication in accounting resulted in lower promotion and tenure rates than in other business disciplines? Another interesting question is whether the ratio of major article slots to faculty affects the distribution of who captures the article slots. For example, do faculty at schools with more resources and greater prestige capture a higher percentage of the articles in major journals when a discipline publishes a relatively low number of such articles?

While the findings in this paper may be somewhat disconcerting to many readers, especially to accounting faculty, Ellison (2002a, 1025) emphasizes the following optimistic message: "If many social norms are indeed possible, then academic communities may be able to achieve dramatic welfare improvements by simply discussing what standards members would like to have and agreeing on a change."

Endnotes

1. In some schools, the entire business faculty votes on each tenure case. Under this system, all faculty members need sufficient information to evaluate research records from other business disciplines.

2. Nevertheless, articles that provide path-breaking insights would clearly be valued more highly than, say, a study that applies well-known theory to competently advance knowledge on a previously studied problem. Most articles fall into the latter category, which Kuhn (1970) refers to as "normal science"; for those studies, journal quality is likely to be used as surrogate for research quality.
3. From 1980 to 1999, the number of articles published in marketing substantially decreased (by 2.71 articles per year), and accounting experienced a decrease of almost one article per year for the Trieschmann set of journals (that is, *The Accounting Review*, *Journal of Accounting Research*, and *Journal of Accounting and Economics*).
4. Consistent with an increase in the difficulty of publishing a major article, I also find that the average number of co-authors per article has increased in all four disciplines.
5. In fact, I know of several accounting departments that have a list of five journals that they consider majors. Whether these additional journals are accepted by faculty from other disciplines likely depends on the credibility of the department and the influence of senior faculty serving on the P&T committee. The evidence in this paper should help in gaining that acceptance.
6. The other business disciplines provide a source of potential ideas. For example, *The Journal of Finance* accepts articles on a broad range of ideas by publishing articles that benefit all members of the profession as main articles and those likely to be read by specialized audiences, but of equivalent quality, in a shorter articles section. Stulz (2000) reports that this approach has changed the mix of articles. I find an average of 28 shorter articles published per year since the policy was adopted in 1989. In general, a short article section makes it easier for editors to publish articles that referees would reject as main articles. As a second example, the Academy of Management encourages the development of ideas by having one major journal, *Academy of Management Review*, devoted solely to the development of theory. (Empirical studies are published by the *Academy of Management Journal*.) To expand the range of ideas considered, the *Academy of Management Review* issues calls for conceptual development on particular topics at least once a year, and publishes the resulting papers as theory development forums. When a highly ranked journal commits to publishing articles on a topic, researchers are willing to commit time and effort to topics that might otherwise be considered too risky. What constitutes theory is quite broad (Whetten 1989).
7. In a more realistic model, academics would receive only a finite number of data points and there would be a random component to each observation.
8. Other factors that could cause referees to hold authors to a slightly too high standard can have the same effect as overconfidence bias. Ellison (2002a, 1023) suggests two possibilities: referees attempt to impress editors with their thoroughness by proposing extensive lists of revisions; and referees are competitive (or spiteful), so they attempt to hold back others in the field by imposing higher standards than the norm.
9. Application of the model to explain differences in article output requires that I drop the assumption that editors intervene to fill article slots in their journals. The model is otherwise consistent with Ellison. In personal correspondence, Glenn Ellison indicates that he views this change as a reasonable extension of the model.
10. If editors completely followed the referees' advice and never overruled, the model would predict an upward drift in overall standards with no change in the relative q-r

weights. Limited editor intervention, which is probably more representative of editor behavior in business and economics, would lead to relatively more weight on *r*-quality. I want to thank Glenn Ellison for clarifying this aspect of the theory.

11. Economic theory that allows a process to be out of equilibrium for an extended period of time is likely to be new to many readers. Ellison (2002a, 1025–26) emphasizes this contribution of *q*-*r* theory in the closing paragraph of the paper developing the theory: "In addition to trying to change how people think about academic publishing, I have tried to make the general point that a long-run trend can be a disequilibrium phenomenon. Comparative statics of equilibria will remain the standard for explaining trends, but I hope that models like the one developed here will find other applications."
12. Note that the role of editors is greater in the revised model compared with the role of editors who are assumed to accept enough articles to fill journal slots. That is, when editors have greater latitude in their accept–reject decisions, they have greater influence in moderating (accelerating) the natural tendency of referees to demand higher quality over time.
13. However, I did read numerous editor reports for evidence of this type. The most useful information was provided by Bowen and Sundem 1982, who surveyed editors in accounting and finance about papers under review in 1980–81. They found that the percentage of articles accepted after only one review was higher for the finance majors (*JF* 35%, *JFE* 35%, *JFQA* 2%) than for the accounting majors (*TAR* 10%, *JAE* 0%, *JAR* 0%); the mean number of reviewing rounds was lower in finance; and the time from original submission to final acceptance was less for finance. This indicates that a higher level of *r*-quality was demanded in accounting than in finance at the beginning of my test period.
14. Most of the article and author data were collected by MBA students working with journals in the university library. The counts are complete for every journal, because I collected data from two other libraries and online journals as needed. The number of articles and authors for a journal issue (for example, January 1988) were entered in a spreadsheet. If the counts appeared unusual in comparison to other issues of that journal, I checked the data. In addition, I calculated the ratio of authors to articles for each journal issue and checked the data if the ratio appeared unusual.
15. Little judgement is required with these classifications. Judgement was required primarily when the editor for a set of special-topic papers wrote an introductory paper in length and with analyses similar to those of research articles. Such introductory papers were counted as research articles. Note that an article with education content would be counted as a research article if it was published with other research articles (instead of in a separate section, or issue of the journal, devoted to education).
16. Trieschmann et al. (2000) ranked business schools and departments using data from 1986 to 1998, but they have posted updated rankings from 1997 to 2001 at http://www.kelley.indiana.edu/ardennis/rankings/ (Dennis, Trieschmann, Northcraft, and Niemi 2002). This allows departments and business schools to monitor their rankings. If the authors continue to provide updates, the journals they have designated as top-tier assume additional importance. (I know of one business school in which these rankings have been used to allocate more money from a merit pool to the higher-ranked departments.)

17. Selecting only two journals for finance can be justified on other grounds. First, the two most highly ranked journals in finance, *The Journal of Finance* and *Journal of Financial Economics*, tend to publish more articles than the major journals in the other disciplines. Second, Zivney and Reichenstein (1994) found that these two journals account for 38.7 percent of the citations to the top 60 finance journals in 1990, while the next two journals add about 5 percent. Similarly, after presenting considerable analyses, Borokhovich, Bricker, and Simkins (1994, 724) conclude that these "two journals comprise the journal core of the discipline".
18. A good case can be made that *Review of Financial Studies* replaced *Journal of Financial and Quantitative Analysis* as the third-ranked journal beginning about 1990. I used *JFQA* because it was published over the entire test period, while *RFS* did not begin operating until 1988.
19. Another reason for selecting *CAR* is representativeness. Brown (2003, Table 4) reports the distribution of articles published in 1999–2001 by accounting specialty (financial, managerial, auditing, tax, and systems) and compares it with the distribution of specialty interests as reported by accounting faculty in Hasselback 2002. Among highly ranked journals, *Contemporary Accounting Research* ranks second to *The Accounting Review* in representativeness. Other highly ranked accounting journals overrepresent some areas, often financial and managerial. (These distributions illustrate that research comparing article output among subdisciplines within accounting would also be worthwhile. Such research could investigate whether quality norms differ among subdisciplines.)
20. Hazard rates are calculated as the number of persons experiencing an event divided by the population at risk of occurrence (Allison 1984). Event history analysis was originally developed in the biosciences, although it is now used in many disciplines. Because the bioscience event of interest is often death, the accepted terminology, including "hazard rate" and "population at risk", has a negative connotation that seems inappropriate when the event is desirable, such as publishing in a major journal.
21. The AACSB could not provide faculty counts for 1980, so the 1981 counts are also used for 1980. For the same reason, the 1998 counts are also used for 1999. These substitutions are unlikely to have a meaningful effect on any of the analyses.
22. Nevertheless, the omission of non-U.S. members from the survey introduces measurement error to the extent that the disciplines differ in the proportion of non-U.S. faculty publishing a major article.
23. A similar result occurs when employment rates drop in a prolonged recession as people give up trying to find a job.
24. These amounts are determined by dividing the accounting proportion into an equally weighted proportion for the other three disciplines. For group 1: [1/3 * (0.115 + 0.113 + 0.130)]/0.062.
25. Conversations with marketing faculty members and published reports by marketing editors indicate that three and even four reviewers became the norm over this period. This practice would increase demands for *r*-quality.
26. For example, *The Journal of Finance* averaged 83.8 articles annually from 1980 to 1997 with five issues per year but only 78 articles for 1998–1999 with six issues per year; *Contemporary Accounting Research* averaged 31.5 articles per year from 1984 to

1996 with one to three issues per year (excluding education articles) and 27.6 articles from 1997 to 1999 with four issues per year.

27. I do not claim that competition is the only factor influencing co-authorship. In particular, decreases in costs of communication have likely played some role.

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