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# Nine Facts about Top Journals in Economics

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*How has publishing in top economics journals changed since 1970? Using a data set that combines information on all articles published in the top-five journals from 1970 to 2012 with their Google Scholar citations, we identify nine key trends. First, annual submissions to the top-five journals nearly doubled from 1990 to 2012. Second, the total number of articles published in these journals actually declined from 400 per year in the late 1970s to 300 per year most recently. As a result, the acceptance rate has fallen from 15 percent to 6 percent, with potential implications for the career progression of young scholars. Third, one journal, the* American Economic Review, *now accounts for 40 percent of top-five publications, up from 25 percent in the 1970s. Fourth, recently published papers are on average three times longer than they were in the 1970s, contributing to the relative shortage of journal space. Fifth, the number of authors per paper has increased from 1.3 in 1970 to 2.3 in 2012, partly offsetting the fall in the number of articles per year. Sixth, citations for top-five publications are high: among papers published in the late 1990s, the median number of Google Scholar citations is 200. Seventh, the ranking of journals by citations has remained relatively stable, with the notable exception of the* Quarterly Journal of Economics, *which climbed from fourth place to first place over the past three decades. Eighth, citation counts are significantly higher for longer papers and those written by more coauthors. Ninth, although the fraction of articles from different fields published in the top five has remained relatively stable, there are important cohort trends in the citations received by papers from different fields, with rising citations to more recent papers in Development and International, and declining citations to recent papers in Econometrics and Theory.* (*JEL* A14)

## 1. *Introduction*

Publications in the top journals have a powerful influence on the direction of

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research in economics, on the career paths of young researchers, and on the pay of academic economists. To what extent has the publication process in these journals changed over the past few decades?

In this paper, we present a descriptive overview of trends among the papers published in the "top-five" economics journals: the *American Economic Review* (*AER*), *Econometrica* (*ECA*), the *Journal of Political Economy* (*JPE*), the *Quarterly Journal of Economics* (*QJE*), and the *Review of Economic Studies* (*RES*). We combine data from *EconLit* on all articles published in these outlets since 1970 with matched citation data from Google Scholar and annual submission counts from the journals.[1] Our analysis builds on the study by Ellison (2002) but extends his work in several directions, including the consideration of paper-specific citations.[2] A complementary analysis by Hamermesh (2012) provides a more detailed analysis of a subset of articles in three of the top-five journals, focusing on the characteristics of authors and of methods employed, which we do not consider.[3]

We identify nine key trends. First, the number of yearly submissions nearly doubled from 1990 to 2012, affecting all the top-five journals except the *JPE*. Second, the total number of articles published in the top journals *declined* from about 400 per year in the late 1970s to around 300 per year in 2010–12. The combination of rising submissions and falling publications led to a sharp fall in the aggregate acceptance rate, from around 15 percent in 1980 to 6 percent today. The increasing difficulty in publishing in the top-five journals may have important implications for the setting of hiring and promotion benchmarks in the field.

Third, the *AER* is the only top-five journal that has substantially increased the number of articles it publishes per year, and as a result now accounts for 40 percent of top journal publications in the field, up from 25 percent in 1970. Assuming that promotion, hiring, and pay decisions continue to value the top-five journals more or less equally, the *AER* now exerts a substantially larger influence over the field than it used to.

Fourth, published papers in the top-five journals are nearly three times longer today than they were in the 1970s. Though the journals as a group have increased their total pages, they have not fully adjusted, leading to the decline in the number of published papers. Fifth, the number of authors per paper has increased monotonically from 1.3 in 1970 to 2.3 in 2012, partly offsetting the decrease in the number of articles published per year. Indeed, weighting each paper by the number of coauthors, the number of authors with a top-five journal article in a given year is somewhat higher today than in the 1970s or 1980s.

Sixth, papers published in the top-five economics journals are highly cited: among those published in the late 1990s, for example, the median article has about 200 Google Scholar citations. Citations for more recently published articles are lower, reflecting the fact that it takes time to accumulate citations. Interestingly, papers published in the 1970s and 1980s also have total citation counts below those of papers published in the 1990s, reflecting the nature of the sources used by Google Scholar, citation practices of current authors, and other potential factors.

Seventh, citation-based rankings of the top-five journals are fairly stable over time, with the notable exception of the *QJE*,

[1] As explained below, we exclude papers published in the annual *Papers and Proceedings* issue of the *AER*, as well as notes, comments, and announcements.

[2] Griffith, Kocherlakota, and Nevo (2009) conduct many of the same analyses as us, though their paper is focused on the relative performance of the *RES* versus the other four journals in the top five.

[3] There is an extensive literature on the rankings of journals (and authors) that summarize various measures of citations: see for example, Kalaitzidakis, Stengos, and Mamuneas (2003) and Ellison (2010).

which climbed from second-to-last to first place among the top five. Eighth, citations are strongly increasing in both the length of a paper and the number of coauthors, suggesting that trends in both dimensions may be driven in part by quality competition. The effects hold both when predicting the number of citations (in logs) and when predicting the probability of an article in the top 5 percent of citations in a given year.

Ninth, despite the relative stability of the distribution of published articles across fields, there are interesting differences in the relative citation rates of newer and older papers in different fields. In particular, papers in Development and International Economics published since 1990 are more highly cited than older (pre-1990) papers in these fields, whereas recent papers in Econometrics and Theory are less cited than older papers in these fields.

## 2. *Data*

We use data from three main sources. First, we use *EconLit* to construct a database of all articles published in the top-five journals since 1970. We extract information for each article on the number and names of author(s), the title, the *Journal of Economic Literature (JEL)* codes, and the page length. We use a text search of titles to exclude papers that can be identified as comments, replies, corrections, or announcements.[4] We also exclude articles in the *Papers and Proceedings* issue of the *AER*. Unlike Ellison (2002), we do not distinguish between full-length and shorter articles. Our final data set includes 13,245 articles published between 1970 and 2012. The Online Data Appendix provides a detailed overview of the main characteristics of the data set, and information on the way we classify older and current *JEL* codes into a consistent set of major fields.

Our second data source is information from the top-five journals on the number of annual submissions. We complement the data assembled by Ellison (2002) with information from the editor's reports published in *AER* and *ECA*, as well as with personal communication from the editors of *JPE*, *QJE*, and *RES*. We were unable to obtain submission information for *ECA* prior to 1974, for *QJE* in the period from 1977 to 1989 (inclusive), and for *RES* prior to 1978.

Our third data source is the total number of Google Scholar citations to each article, as retrieved from Google Scholar in October 2012. We first used an automated web-scraping program to query Google Scholar with the exact title of each article. This process successfully retrieved citations for about 95 percent of articles. Many of the remaining 5 percent of articles have a typographical or spelling error in the title in *Econlit* or Google Scholar. For these articles, a team of research assistants searched the citations by hand. We have at least one Google Scholar citation for 98.7 percent of articles. A spot check of the remaining 176 articles suggests that most are relatively short papers that received little attention in the subsequent literature. More details on this procedure are in the Online Data Appendix.

## 3. *Findings*

### 3.1 *Number of Submissions*

Figure 1 shows the annual numbers of submissions to each of the top-five journals, as well as the total count for all five journals. (Online Data Appendix table 1 shows the corresponding raw data.) Total submissions have nearly doubled since 1990, from about

[4]Our extraction from *EconLit* found 882 comments, 510 replies, 104 errata, 156 "discussions," and 132 other types of nonrefereed entries, such as editor's reports. Note that we *do not* exclude shorter papers published in *ECA* as "Notes and Comments."

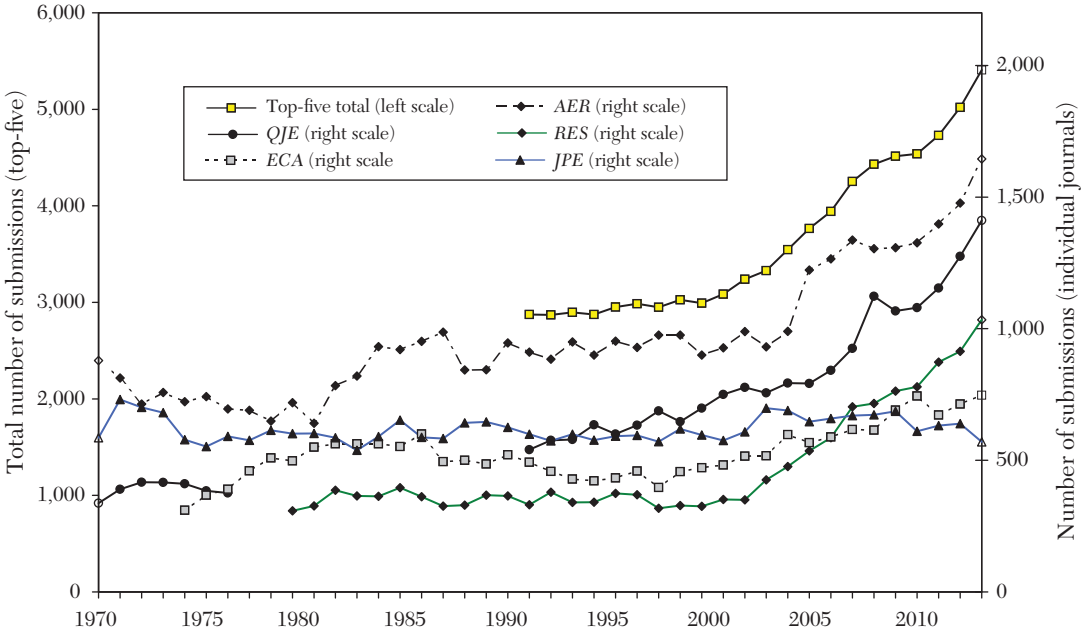


*Figure* 1. Number of Submissions per Year

2,800 per year to 5,800 submissions in 2011. The increases are especially large for *QJE* and *RES*, but are clearly present for all the journals except *JPE*, which received about the same number of submissions in 2011 as in 1987–89. It is also interesting to note that most of the secular increase in submissions documented in the figure has occurred since the year 2000. One important implication of this surge is that editors and referees at the top-five journals are facing a growing workload, even ignoring changes in the complexity of the papers they are handling (Ellison 2002).

### 3.2 *Number of Articles Published*

Figure 2 (with the raw data in Online Data Appendix table 2) displays a less-well-known trend: over the past three decades the top-five economics journals have tended to publish a *smaller* number of articles per year. During the period from 1970 to 1975, the top five published an average of 341 articles per year. The number increased to an average of 398 articles during the 1976–80 period, then began a long period of decline, falling to 325 articles per year in the 1980s and around 250 per year or less in the late 1990s. Over the 2001–10 period, the number recovered very slightly (to around 275 articles per year), and then increased again in 2011–12 to 307 articles, largely because of the decision of the *AER* to increase the number of issues per year from four to six (not counting the *Papers and Proceedings* issue). Even taking into account this recent increase, the number of articles published by the five top journals is 20 percent lower today than during the

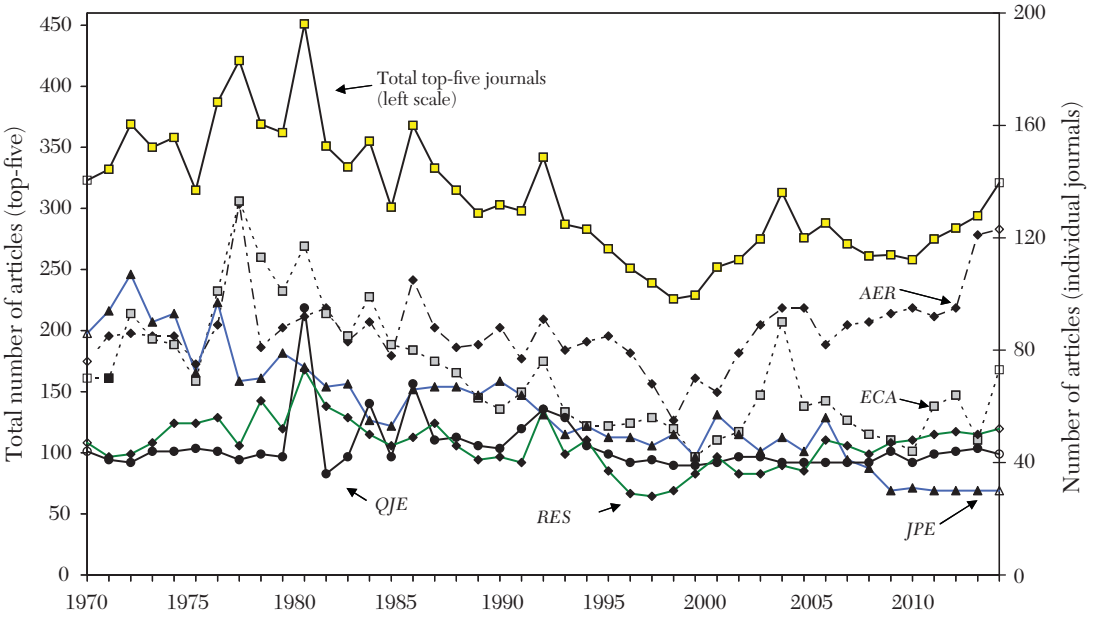


*Figure* 2. Number of Articles Published per Year

*Notes:* Publications exclude notes, comments, announcements, and *Papers and Proceedings*. Totals for 2012 estimated.

1976–1980 period, despite the large increase in submissions.

Which journals are most responsible for the decline in the number of articles published? The largest decreases are for *ECA*, which cut the average number of articles per year from around 100 in the 1970s to 60 today, and the *JPE*, which published 85 articles per year in the 1970s but now publishes only 30 articles per year. The *QJE* and *RES* also experienced declines but of smaller magnitudes. Only the *AER* has increased the number of articles published today relative to the late 1970s, from about 100 per year to around 125 per year.

An interesting consequence of these trends is that the *AER* now accounts for a significantly larger share of top-five journal publications, up from 25 percent in the late 1970s to 40 percent in the years 2011–12. In contrast, the *JPE*, which also published about one-quarter of all top-five articles in the late 1970s, now publishes less than 10 percent of these articles. Stated differently, in the late 1970s, the *AER* and the *JPE* had about equal say in the gatekeeping process that determined publications in the top-five journals. Now the *AER* has four times greater weight than the *JPE*.

In the absence of micro data on the manuscripts submitted to the top-five journals, we form a rough estimate of the "acceptance rate" for a given journal in year $t$ by dividing the number of published articles in year $t$ by the average of the number of submissions in years $t-1$ and $t-2$. Figure 3

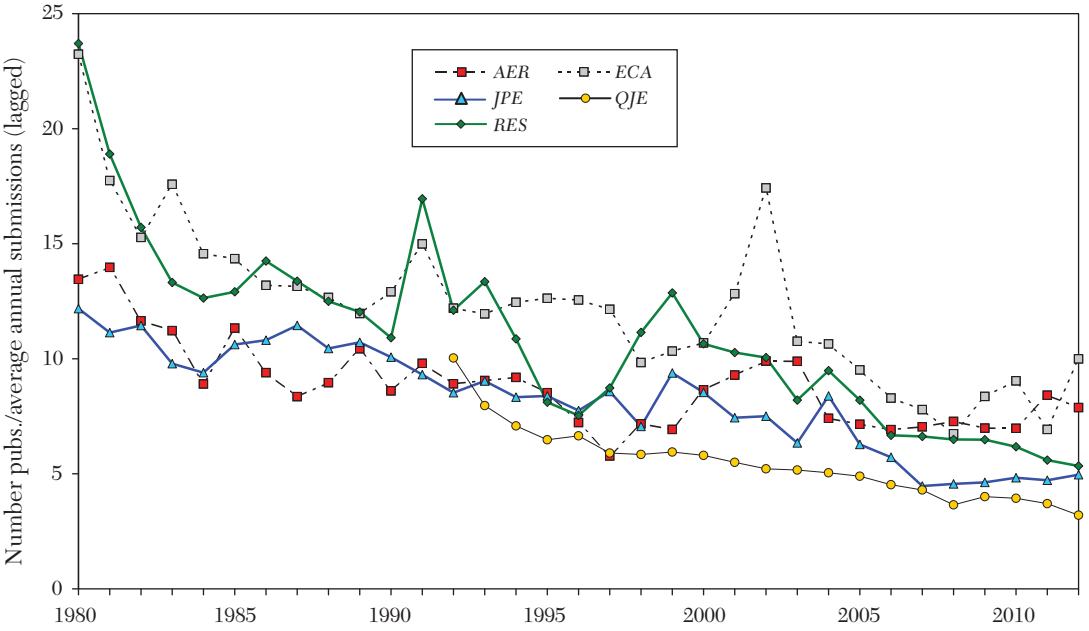


*Figure* 3. Number of Publications Divided by Average Annual Number of Submissions in Previous Two Years

*Notes:* Figure shows 100 times number of articles published in year $t$, divided by average number of submissions in year $t-1$ and $t-2$.

(with the raw data in Online Data Appendix table 3) illustrates the trends over time in the estimated acceptance rates. As expected given the trends in submissions and publications, acceptance rates have fallen across the board. Comparing 1976–80 to the most recent period (2011–12), the acceptance rate declined from 13.8 percent to 8.1 percent for the *AER*, from 27.1 percent to 8.5 percent for *ECA*, and from 13.3 percent to 4.8 percent for the *JPE*. While comparable data are unavailable for the *QJE* and *RES*, using an earlier period we document a decrease for the *QJE* from 10.9 percent in the early 1970s to 3.5 percent in 2011–12. For the *RES*, we document a decline in the acceptance rate from an average of 16.9 percent in the early 1980s to an average of 5.5 percent today.

Currently, the *QJE* is the most selective of the top-five journals, with an acceptance rate of around 3 percent, followed by the *JPE* and *RES*, with acceptance rates of around 5 percent. The least selective of the top-five are *AER* and *ECA*, with acceptance rates of around 8 percent.

The patterns documented here have potential implications for the careers of economists. Over time, and especially during the last fifteen years, it has become increasingly difficult to publish in the top-five journals. Other things equal, this suggests that hiring and promotion benchmarks based on top-five publications (e.g., "at least 1 top-five

publication for tenure") are significantly harder to reach. As we discuss below, however, a partial offsetting factor is the number of authors per paper, which has expanded relatively quickly, perhaps in part as a reaction to the increasing difficulty in publishing in the top outlets. Another implication of the data in figure 2 is that, to the extent that publications in top-five journals are valued equally, the *AER* now carries substantially more weight in determining the job opportunities and salaries of economists than other top-five journals, while the *JPE* has declined in influence.

### 3.3 *Length of Articles*

Next, we present evidence on the page length of articles. Since journals have different formatting, we estimate the average number of characters in a typical page of each journal, and renormalize the length of each published article to its length as a standard manuscript formatted with 1.5-spacing, 12-point font, and 1-inch margins (see Card and DellaVigna 2012 for details). This adjustment takes into account changes in formatting at the *AER*, which moved from a two-column format to a single column format in 2008, and adopted a less dense single column format in 2011.[5] Still, the adjustment is not perfect, as for example it does not take into account the different formatting of tables and figures.

Figure 4 shows that the average (standardized) length has increased from 16 pages in the early 1970s to 45.5 pages in 2011–12, a nearly 300 percent increase.[6] Put differently, a paper in the 10th percentile of lengths in 2012 is *longer* than a paper in the 90th percentile of lengths in the early 1970s.

Is the increase due to a particular journal? We document in Card and DellaVigna (2012) that the five journals moved in a remarkably parallel way over time. The normalization of page limits plays an important role here because without standardization the *QJE*—which uses a relatively low-density format—appears to publish much longer papers than the other top five. In reality the *QJE* papers are about the same length as papers in the other top-five journals in a given year.

We suspect that the steady growth in the length of published papers is a major factor in explaining the fall in the number of articles published in the top-five outlets each year. Even with a sizable increase in the total number of pages published by each journal, the increase in the length of papers has been so rapid that it has forced a cut in the number of articles published per issue. Of course, this constraint could be relaxed by publishing more issues per year, but so far only the *AER* has responded in this way.

We have also looked at trends in paper length by field. Perhaps surprisingly, we find that papers in nearly all fields—including theory and econometrics—have become longer over the past forty years.

### 3.4 *Number of Coauthors*

Figure 4 shows that the number of authors per paper has also grown steadily, though less quickly than average paper length.[7] In the early 1970s, three quarters of articles were single-authored, and the average number of authors in a paper was 1.3. By the early 1990s, the fraction of single-authored papers had fallen to 50 percent, and the mean number of authors reached 1.6. Most recently (2011–12), more than three quarters of

[5] We are grateful to Steve Stelling, Managing Editor of *AER*, for explaining these changes.

[6] Previous studies have also noted the steady rise in page lengths among top economics journals, including Ellison (2002) and Griffith, Kocherlakota, and Nevo (2009).

[7] The increase in the number of coauthors has been documented, among others, by Conley et al. (2012).

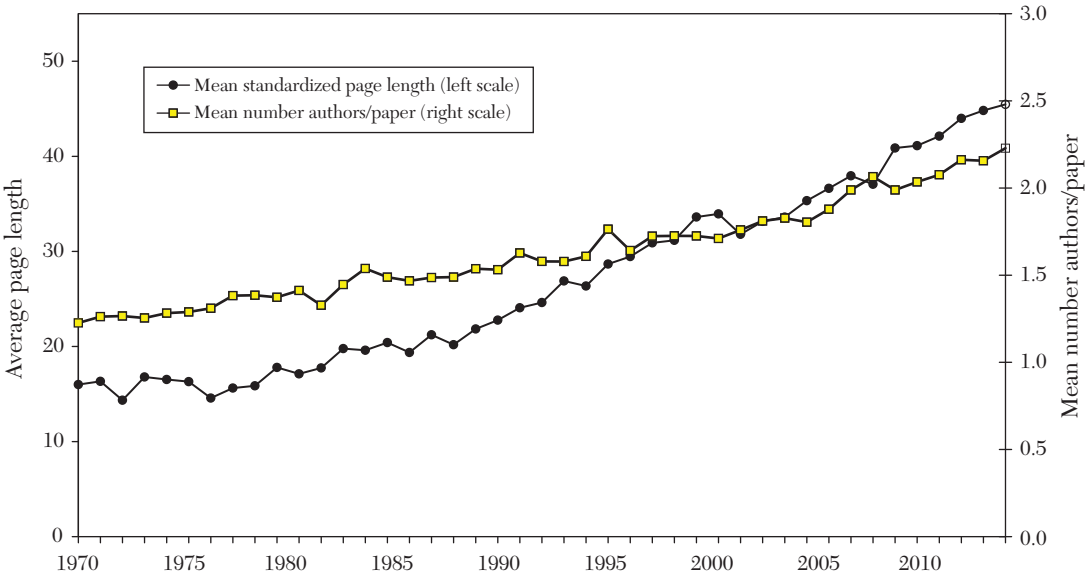


*Figure* 4. Trends in Length and Number of Authors of Published Papers

*Notes:* Page lengths are adjusted for differences in page density across journals. Standardized length assumes 2,550 characters.

papers have at least two authors and the mean number of authors is 2.2.

As noted earlier, the rising number of authors per paper means that, despite a smaller number of papers per year in the top-five journals, the number of *authors* with papers in the top five (i.e., the number of papers published multiplied by the average number of authors per paper) has actually trended upward.[8] This series is plotted in Online Data Appendix figure 1, and is fairly stable ranging between 400 and 550 from the early 1970s to the late 1990s. Since the year 2000, this figure has however increased reaching 600 or more in 2010–11. To the extent that coauthored papers are as valuable as single-authored papers, the rise in coauthorship has mitigated the fall in the number of papers published per year, though relative to submission flows the author-weighted number of papers per year in the top-five journals has still failed to keep pace.[9]

### 3.5 *Citations*

Figure 5 shows the median number of Google Scholar citations (measured as of October 2012) for the articles published in the top-five journals in each year of our

[8] This statistic does not adjust for the fact that some individual authors may have more than one paper in a top journal in a given year.

[9] Hilmer, Hilmer, and Ransom's (2012) recent analysis of academic economists' salaries suggests that coauthored papers are as valuable as single authored papers, conditional on the number of citations they receive.

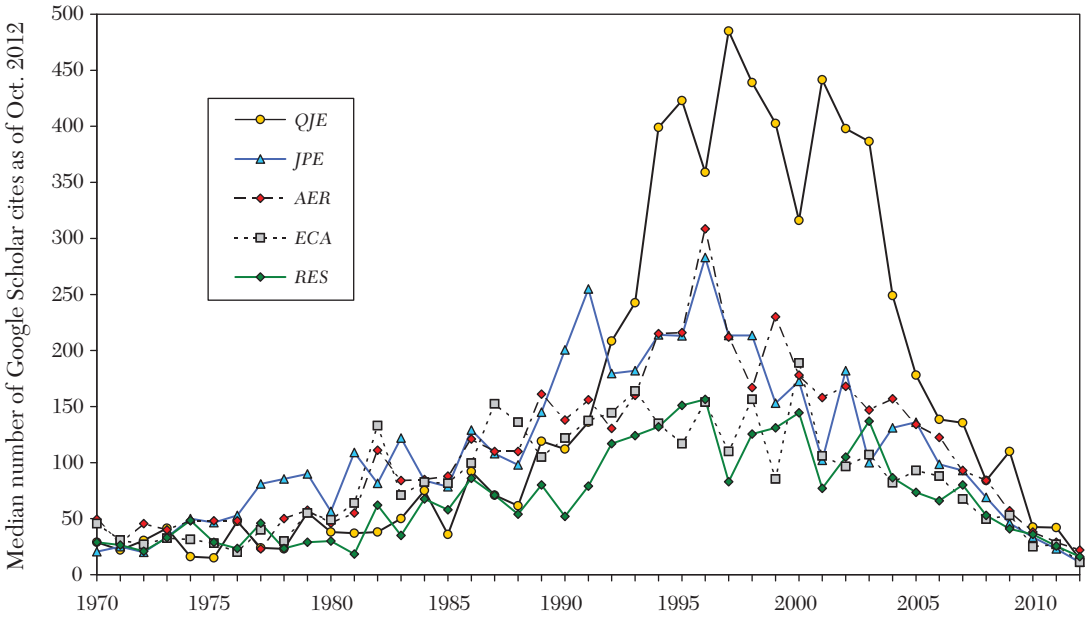


*Figure* 5. Median Number of Google Scholar Cites per Published Paper, by Journal and Year of Publication

*Notes:* Google scholar citations were extracted in October 2012. Published papers exclude notes, comments, announcements, and *Papers and Proceedings.*

sample (see also Online Data Appendix table 4). Note first the inverse U-shaped pattern of the citation counts for each of the journals and for the top-five outlets as a whole. The pattern of lower citations for the most recent articles is expected, since recently published papers have had less time to accumulate citations. The pattern of lower total citations for older articles is more surprising, and arguably reflects the nature of Google Scholar, which searches through online working papers and publications and is therefore less likely to find citations to older papers.[10] The most-cited articles in our data are those published between 1995 and 2000.

A second interesting feature of the data in figure 5 is the relatively high number of citations to top-five publications. Among papers published in the 1990–2000 period, the median number of Google Scholar citations is typically around 200. A citation count of 200 is relatively impressive, and reflects the success of the top-five journals in identifying high-impact papers, or in inducing high impact by virtue of publication in a top outlet, two possibilities we cannot distinguish.

[10] Specifically, citations in older working papers that are not posted on the Internet will not be counted. Griffith, Kocherlakota, and Nevo (2009) conduct a small scale comparison between citations in Google Scholar, ISI Web of Knowledge, and Citations in Economics. They find a relatively high degree of correlation between the three sources of citations across twenty randomly selected papers.

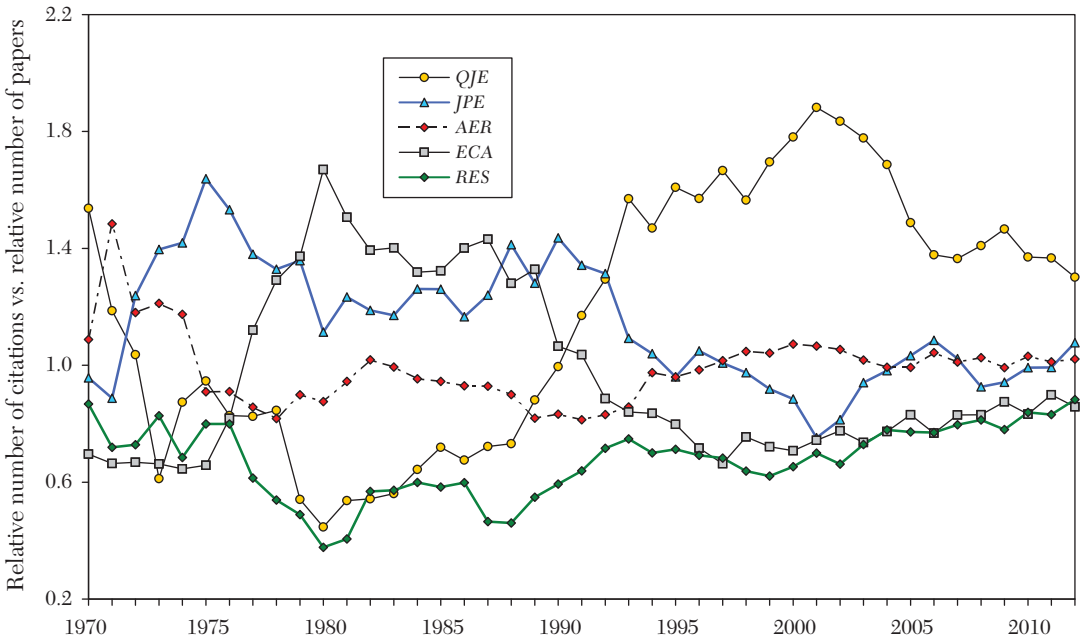


*Figure* 6. Relative Share of Google Scholar Cites versus Published Papers by Journal and Year of Publication

*Notes:* Relative share is smoothed using 5-year centered moving average. See notes to figure 5.

A third interesting feature of figure 5 is the relative ranking of citations for articles in different journals. Median citations for articles in the *AER* and the *JPE* tend to be quite similar from year to year—for example, around 100 in the late 1980s, between 250 and 300 in the mid-1990s, and around 130 in 2005. In the earlier years of our sample, articles in *ECA* have about the same median citations as those in the *AER* or the *JPE*. Starting in the 1990s, however, there is a discernible fall in the relative impact of *ECA* articles. Articles in the *RES* tend to be the least-cited among the top-five journals, although *RES*'s relative position appears to be improving in the last few years.

Perhaps the most obvious feature of figure 5 is the dramatic increase in relative citations for articles in the *QJE*. Until the early 1990s, articles published in the *QJE* tended to have relatively low citations, on par with those in *RES*. Remarkably, though, between 1990 and 1992, median citations for articles in the *QJE* rise to the top of the group. Indeed, in the years from 1994 to 2004, median citations for articles in *QJE* are about two times larger than median citations for articles in *AER* and *JPE*, and about three times the median for articles in *ECA* and *RES*. Median citations for more recently published articles are lower, but the *QJE* remains the journal with the highest median citations per paper in all years from 1991 to 2011.

The large swings of citations over time in figure 5 make it somewhat hard to compare citations across journals in the earlier and

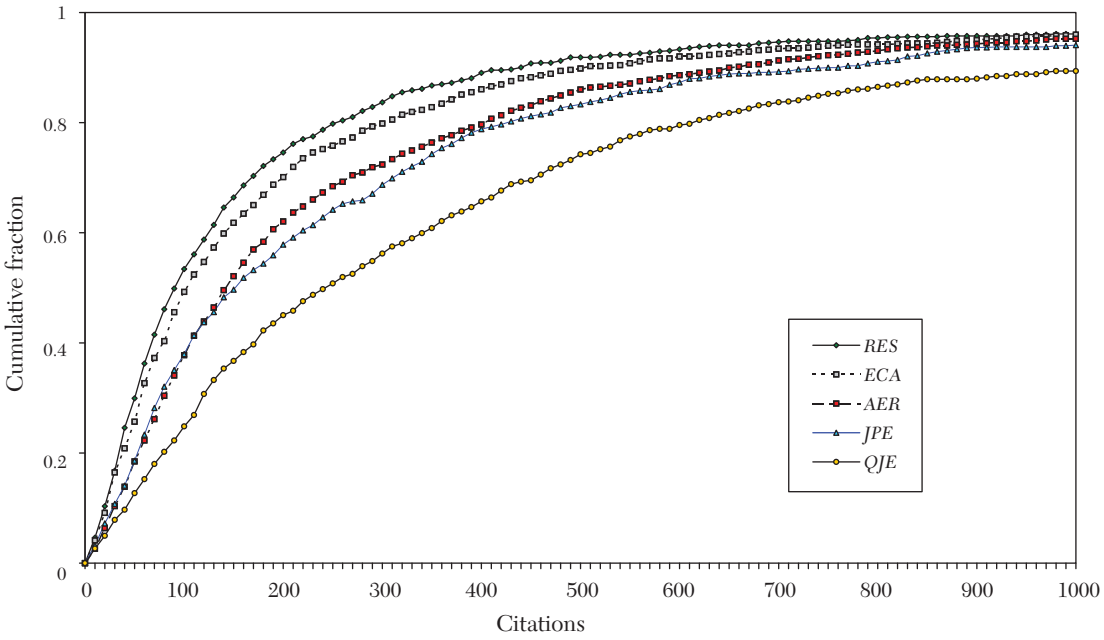


*Figure* 7. Cumulative Distribution Functions for Citations to Papers Published 1990–2009, by Journal

later years. In figure 6, we plot the year-by-year share of Google Scholar citations for a given journal compared to all citations to articles in top-five journals in that year, relative to the share of number of papers for that same journal out of all top-five articles in that year. So, for example, all the articles published in the *AER* in 2000 account for 34.9 percent of all the citations to top-five journal articles in that year, but the *AER* accounts for only 30.6 percent of articles published in economics in 2000; hence, the *AER* has a relative share of 1.14, reflecting a disproportionate citation influence by about 14 percent. The series is smoothed using a five-year centered moving average. We note that this measure reflects mean, as opposite to median, citations. The graph shows that, in the 1970s, the *JPE* is the leading journal by this measure, followed by *ECA* in the 1980s. Interestingly, *ECA*'s impact in the 1980s is higher when considering mean, as opposed to median, citations. The citation impact of both *JPE* and *ECA* declines sharply in the 1990s, while the impact of the *QJE* rises quickly at the same time. The graph also shows a slow but steady improvement for the impact of the *RES* since the late 1990s. Finally, the *AER* stays at a relatively constant citation share of about 1, except in the early 1970s when it was higher.

Median and mean citation rates give a potentially limited summary of the impact of the articles published in a given journal. To provide a more complete picture, we show in figure 7 the cumulative distribution functions (censored at 1,000 citations) for citations of articles published in the top-five

journals over the period 1990–2009. The relative rankings of the journals are consistent at virtually all quantiles and confirm the patterns in figures 5 and 6. In particular, the *AER* and *JPE* have relatively similar distributions, and both dominate *ECA* and *RES*. The *QJE* is the citation leader, with the smallest fraction of poorly cited articles (e.g., only 13 percent of papers have less than 50 citations, versus 18 percent at *AER* and *JPE*, 26 percent at *ECA*, and 30 percent at RES) *and* the highest fraction of very highly cited papers (e.g., 10 percent of *QJE* papers have over 1,000 Google Scholar citations, versus about 5 percent of articles at each of the other top-five journals). Online Data Appendix figure 2 plots the corresponding cumulative distribution functions for the earlier years 1970–89. In these years, the *QJE* is dominated by the citation record of *ECA*, *AER*, and *JPE*.

### 3.6 *A Regression Analysis of Citations*

To complement this descriptive analysis of citation patterns by journal we conduct a regression-based analysis, using as the dependent variable the log of the number of citations for each of the 13,089 papers published in the top-five journals since 1970. Citations are extremely skewed; log citations are nearly symmetrically distributed, with only a small degree of kurtosis. Moreover, a proportional model for the effect of factors like time-since-publication, field, and page length is conceptually attractive and readily interpretable. The downside is that we have to drop the 1.3 percent of papers with no citations. However, experiments with alternative functional forms (such as log(citations+1) or the inverse hyperbolic sine function) suggest that our findings are quite robust.

Table 1 presents a selection of our estimated regression models. We begin in column 1 with a baseline model that includes a quartic function of years since publication (to capture the time patterns shown in figure 5) and dummies for each journal, interacted with an indicator for pre-1990 or post-1990 publications.[11] This simple model has an *R*-squared coefficient of 18 percent. Looking at the journal effects for the pre-1990 cohort, the estimates suggest that all the other journals had higher citations than *RES* (the base group). Papers in *JPE* had the highest citation rates (estimated effect = 0.55), while those in the *AER* and *ECA* had somewhat lower rates (estimated effects = 0.43 and 0.37, respectively), and papers in the *QJE* were only slightly more likely to be cited than those in *RES* (effect = 0.02). Post-1990, the *AER* and *JPE* are nearly equal (estimated effects = 0.40 and 0.37, respectively), while citations to *ECA* papers have fallen sharply to about the same level as *RES* papers (estimated effect = 0.07). As suggested in figure 5, the big "winner" is the *QJE*, which moved substantially ahead of all other journals after 1990, with a 78 log point citation premium over pre-1990 *RES* papers.

An obvious question is whether the rise in citations to *QJE* papers (and fall in citations to papers in *ECA*) can be explained in part by observable characteristics of the papers. One possible factor is field: in the past two decades, for example, the *QJE* has published a relatively high fraction of applied papers, while *ECA* tends to publish theoretical papers. To assess the importance of field composition, we classify *JEL* codes into fourteen mutually exclusive fields.[12] We assign each *JEL* code from EconLit to one of these fields: hence, if an article is associated with two *JEL* codes, we have either one

[11] Models that allow the journal effects to vary by five-year publication cohort are very similar.

[12] See the Online Data Appendix. Our fields are economic theory, microeconomics, econometric theory, macroeconomics, international, finance, public, labor, history, industrial organization (IO), development, lab-based experiments, other applied micro fields (health, urban, law and economics), and all other fields. Our classification is similar to the one used by Ellison (2002). Kelly and Bruestle (2011) also document the shift in fields published in economics journals.

TABLE 1
DETERMINANTS OF CITATIONS FOR ARTICLES IN TOP-FIVE JOURNALS, 1970–2012

| | Dep. Var. = log citations in October 2012 | | | | Dep. Var. = 1 if top 5 percent cited |
|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) |
| Journal and cohort (RES, 1970–89 = reference) | | | | | |
| *AER* 1970–1989 | 0.43 | 0.40 | 0.61 | 0.66 | 0.032 |
| | (0.06) | (0.06) | (0.05) | (0.05) | (0.009) |
| *AER* 1990–2012 | 0.40 | 0.37 | 0.48 | 0.52 | 0.023 |
| | (0.09) | (0.09) | (0.08) | (0.10) | (0.012) |
| *ECA* 1970–1989 | 0.37 | 0.39 | 0.43 | 0.40 | 0.029 |
| | (0.06) | (0.06) | (0.05) | (0.05) | (0.009) |
| *ECA* 1990–2012 | 0.07 | 0.14 | 0.18 | 0.32 | 0.015 |
| | (0.09) | (0.09) | (0.08) | (0.10) | (0.013) |
| *JPE* 1970–1989 | 0.55 | 0.54 | 0.55 | 0.60 | 0.037 |
| | (0.06) | (0.06) | (0.06) | (0.06) | (0.009) |
| *JPE* 1990–2012 | 0.37 | 0.33 | 0.33 | 0.38 | 0.022 |
| | (0.09) | (0.09) | (0.08) | (0.10) | (0.013) |
| *QJE* 1970–1989 | 0.03 | 0.02 | 0.21 | 0.25 | 0.025 |
| | (0.07) | (0.07) | (0.06) | (0.06) | (0.010) |
| *QJE* 1990–2012 | 0.78 | 0.72 | 0.67 | 0.70 | 0.055 |
| | (0.09) | (0.09) | (0.08) | (0.10) | (0.013) |
| *RES* 1990–2012 | 0.02 | 0.01 | –0.11 | –0.02 | –0.007 |
| | (0.09) | (0.09) | (0.08) | (0.10) | (0.013) |
| Quintile of standardized page length (1st quintile = reference) | | | | | |
| 2nd quintile (12.04–20.12 pages) | | | 0.93 | 0.94 | 0.024 |
| | | | (0.04) | (0.04) | (0.006) |
| 3rd quintile (20.12–27.69 pages) | | | 1.39 | 1.40 | 0.058 |
| | | | (0.04) | (0.04) | (0.006) |
| 4th quintile (27.69–38.03 pages) | | | 1.68 | 1.68 | 0.074 |
| | | | (0.04) | (0.04) | (0.007) |
| 5th quintile (38.03+ pages) | | | 1.96 | 1.95 | 0.110 |
| | | | (0.05) | (0.05) | (0.008) |
| Number of authors (single author = reference)[a] | | | | | |
| 2 authors | | | 0.21 | 0.21 | 0.013 |
| | | | (0.03) | (0.03) | (0.004) |
| 3 authors | | | 0.26 | 0.26 | 0.022 |
| | | | (0.04) | (0.04) | (0.007) |
| 4 authors | | | 0.48 | 0.52 | 0.034 |
| | | | (0.14) | (0.14) | (0.022) |

(*continued*)

TABLE 1
DETERMINANTS OF CITATIONS FOR ARTICLES IN TOP-FIVE JOURNALS, 1970–2012 (*continued*)

| | Dep. Var. = log citations in October 2012 | | | | Dep. Var. = 1 if top 5 percent cited |
|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) |
| Controls for field (14 fields) | no | yes | yes | yes | yes |
| Controls for cohort × field | no | no | no | yes | no |
| Quartic in years since publication | yes | yes | yes | yes | yes |
| $R^2$ | 0.18 | 0.20 | 0.32 | 0.33 | 0.031 |

*Notes:* Dependent variable in columns 1–4 is log of number of Google Scholar citations, reported as of October 2012. (Mean is 4.304, standard deviation is 1.594). Dependent variable in column 5 is indicator for article being in top 5 percent of citations for year of publication. (Mean is 0.0483). Sample includes 13,069 articles published in top 5 journals from 1970 to 2012, excluding notes, comments, announcements, and *Papers and Proceedings*. 176 articles with no citations are excluded from the sample. Standardized page length is estimated page length assuming 2,550 characters/page. Fields are based on *JEL* codes; articles can be classified in up to five fields based on first five *JEL* codes in *EconLit*.

[a] Models also include dummies for five authors, six authors, and seven or more authors.

or two field dummies set to one for the article (depending on if the two *JEL* codes fall under the same field).

Figure 8 (and the corresponding Online Data Appendix table 5) shows the relative frequencies of the various fields in the top-five journals as a whole. As shown by the total height of the graph, the number of fields papers are assigned to has risen over our sample period from an average of about 1.6 per article to nearly 2. Nevertheless, the relative shares of the different fields are fairly constant over time: theory is the largest field, accounting for about 30 percent of all articles; macro is next (about 20 percent of papers); labor and microeconomics are tied for third (16–17 percent each); and econometrics, IO, and international each account for about 10–12 percent of papers).

The field distributions of papers in the different journals largely conform to expectations. For example, theory papers are underrepresented in the *QJE* and *JPE* while labor and IO papers are underrepresented in *ECA*. Conversely, theory and econometrics papers are overrepresented in *ECA* and *RES*, while labor papers are more likely to appear in the *QJE*, and IO and international papers are more prevalent in the *AER*.

The model in column 2 of table 1 introduces field dummies to the citation model.[13] Although several of the field indicators are highly significant, their inclusion has relatively small impacts on the estimated journal×cohort effects, implying that trends in the citation counts for articles in different journals are largely due to factors other than field. One small difference is *ECA:* adding field effects slightly moderates the decline in citations for *ECA* publications

[13] We include dummies indicating the fields assigned to a paper (up to six), with "other fields" as the omitted dummy. Since the dummies do not sum to 1, we also include a variable representing the number of *JEL* codes provided. This gives numerically identical estimates to a specification in which we simply include all the dummies.

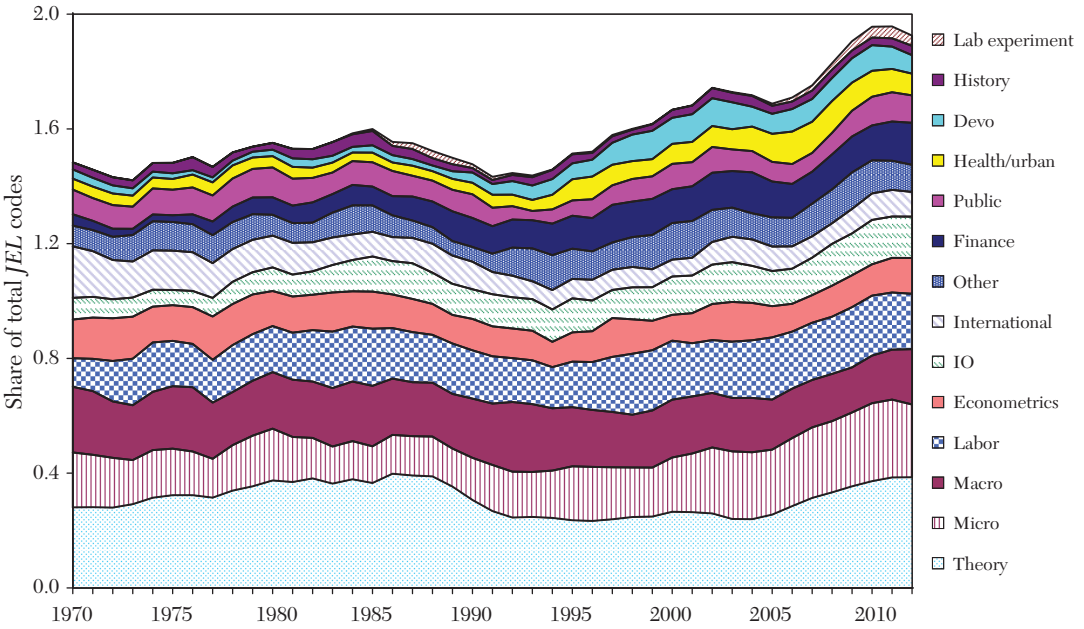


*Figure* 8. Field Distribution of *JEL* Codes for Articles in Top Five Journals

*Notes:* Field shares sum to more than 1 because papers can reference multiple fields. See text for field classification system. Data are smoothed using centered three-year moving average.

relative to pre-1990 *AER* papers (from a 30 percent decline to a 25 percent decline). A look at the estimated field effects explains this difference. The largest positive field effects (relative to the generic "all other fields" category) are for development (+43 percent), finance (+35 percent), labor (+25 percent), and other empirical micro (+20 percent), all applied fields that are substantially under-represented in *ECA* relative to the other top-five journals, particularly since 1990.[14]

[14] All four of these field effects are statistically significant. The other significant field effects are for microeconomics (+17 percent), IO (+14 percent), and history (–68 percent).

The model in column 3 of the table adds controls for the length of each paper and number of coauthors. Specifically, we divide the overall distribution of normalized page lengths into quintiles, and include dummies for the four highest quintiles of length. We also include a full set of dummies for different numbers of coauthors (censoring the count at nine). As suggested by the rather large rise in the *R*-squared of the model (from 20 percent to 32 percent), these two features are very powerful predictors of future citations. Relative to a paper in the first quintile of normalized page lengths (12.5 pages or less), mean log citations for a paper in the second quintile (12.5 to 20.5 pages) are 0.93 higher (i.e., 253 percent

more citations); mean log citations for a paper in the third quintile (20.5 to 28 pages) are 1.39 higher (i.e., 401 percent more cites), mean log citations for a paper in the fourth quintile (29 to 38 pages) are 1.68 higher (i.e., 536 percent higher), and mean log citations for a paper in the fifth quintile (39+ pages) are 1.96 higher (i.e., 709 percent higher). Similarly, relative to a single-authored paper, mean log citations for a paper with two, three, or four authors are 0.21, 0.26, and 0.48 higher, respectively, implying 23 percent, 30 percent, and 61 percent more citations. The findings on the impact of paper length and number of coauthors are consistent with Hamermesh and Oster (2002) and Ellison (2011).

Interestingly, controls for length and number of coauthors also have some effect on the relative rankings of the journals in different cohorts. Controls for length improve the apparent status of *AER* papers because the *AER* publishes a relatively large number of "Shorter Papers," which get fewer citations, on average. They also lead to a somewhat more positive assessment of the *QJE* prior to 1990 (when the *QJE* tended to publish relatively few long papers).

Finally, in column 4 we present a model that allows the impacts of different fields to change over time. As has been noted by earlier analysts (including Ellison 2002 and Griffith, Kocherlakota, and Nevo 2009), it appears that relatively few recent papers in economic theory and econometric theory have had the widespread influence of the "classic" papers in these areas from the 1970s and 1980s. To control for such changes, we include field dummies and interactions of these dummies with an indicator for post-1990 publication date. While crude, this specification captures any changing citation potential for papers from different fields in the pre- and post-1990 eras.

The estimated interactions of the field dummies with post-1990 indicators confirm that the impact of theory and econometrics papers has declined. (The estimated interaction effects are –0.33 and –0.12, respectively; the theory interaction is highly significant). At the same time, the impacts of papers in international, development and macro have all risen substantially. (The estimated interaction effects are +0.51, +0.22, and +0.25, respectively, and are all significant at conventional levels). Adding these controls has a small effect on the estimated journal × cohort effects, and in particular leads to a rise in the relative status of post-1990 papers in *ECA*. Overall, however, the journal × cohort effects in column 4 of table 1 are remarkably similar to those in column 1, and we conclude that measured characteristics of the papers published by the different journals in different time periods can explain only a small part of the differences in citations to these papers.

Finally, in column 5 we estimate a similar model as in column 3, but we focus the attention only on the top-cited articles. Namely, we estimate a linear probability model with an indicator variable for an article in the top 5 percent of citations in a given year as dependent variable.[15] This allows us to estimate whether the impact of journal, paper length, and number of authors holds also at the very top. Interestingly, the answer is yes. The ranking of journals is largely unaffected, with the most positive estimated effect being for the *QJE* in the period 1990–2012, with an estimated increase of 5.5 percentage points in the probability of publishing a top 5 percent cited article relative to the omitted category (the *RES* in 1970–89), a large effect. Even larger is the effect of paper length: a paper in the fifth quintile is associated with an 11 percent point higher probability of being in the top 5 percent of citations, that is,

[15] The cut-offs for top 5 percent citation are 618 in 1970, 501 in 1975, 566 in 1980, 781 in 1985, 1,596 in 1990, 1,477 in 1995, 1,154 in 2000, 592 in 2005, and 223 in 2010.

a tripling of probability relative to the mean such probability of 4.8 percentage points. Finally, the number of coauthors also has a positive effect, if a smaller one.

## 4. *Conclusions*

In this paper, we have presented evidence on trends in submissions, articles published, selectivity, length, coauthorship, field, and citations for papers in the top-five economics journals. On the one hand, much has changed over the past forty years. There are many more submissions, but fewer papers are published per year. Perhaps because of this intensifying competition, each paper has more coauthors. Papers today are also substantially longer, even in the most technical fields. So far, only the *AER* has responded to the increasing average length of papers by publishing more issues per year. As a direct result, the *AER* now publishes 40 percent of the total number of papers in the top-five outlets. On the other hand, citation based rankings of the top-five journals are relatively stable over the past forty years. The two major shifts are a fall in the relative impact of papers in *ECA*, and the remarkable transformation of the *QJE* from a comparatively low-citation outlet to the journal with the most highly cited articles of the top five.

We believe that these findings have potentially significant implications for academic economists, particularly with regard to the career paths of younger scholars. Most importantly, the competition for space in the top journals has grown fiercer over time. The overall acceptance rate for submissions at the top-five journals is about one-third as high today as in the early 1970s. This trend is independent of the trend documented by Ellison (2002) toward longer delays in the adjudication and revision process, and in fact has largely emerged in the decade since Ellison's original investigation. Both lower acceptance rates and longer delays, however, make it increasingly difficult for any one author to achieve a given set of publication benchmarks. Authors have clearly responded by forming bigger teams, and to the extent that coauthored papers are treated as equivalent to single authored papers (e.g., Hilmer, Hilmer, and Ransom 2012), they have been able to partially mitigate the adverse effects of lower acceptance rates and longer delays.

Our findings also have important implications for the interpretation of the trend in the length of economics articles. This trend is often interpreted as evidence of failure: either by authors—who have failed to communicate their findings in a concise way—or by referees and editors—who have been misled by "fluff," or have demanded too much secondary material. The very large positive effects of paper length on citation counts suggest instead that longer papers may be better papers. One interpretation is that as the competition for journal space has increased, authors have improved the quality of their papers and in the process made them longer. Whether we want to regulate this competition by restricting the length of papers, or adapt to it by increasing the number of "pages" published by the top journals is clearly an interesting policy issue. In Card and DellaVigna (2012), we examine the impact of the imposition of page limits at the *AER* and at the *Journal of the European Economic Association*, and show that authors respond differently—whether by shortening papers or by sending them to another journal—depending on the outlet, suggesting important differences in local monopoly power (over authors) for journals in different tiers.

Our findings also underscore the critical role of reputations among scholarly journals. Just as the identities of the "top-five" journals have remained constant, the relative rankings of the top-five journals have remained broadly stable over forty years. Yet, there is also clear evidence that reputations

can change: the abrupt rise in citations to articles published by the *QJE* after 1990 suggests that a (sustained) change in editorial policy can be effective. Similarly, the dramatic ramp-up in submissions at the *RES* in the last ten years points to a change in the appeal of the journal.

Finally, our results raise the question of "Why the Top Five?" Clearly, there are differences in the impacts of the top five: in the 1970s, an article published in the *AER* or *JPE* had about 40 percent more citations than one in the *QJE* or *RES*. More recently, an article in the *QJE* is 30 or 40 percent more likely to be cited than one in the *AER*. Furthermore, as the number (and complexity) of economics papers has increased, five journals, publishing only 300 or so articles per year, represent an increasingly limited resource for the profession.

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