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The Geography and Concentration of Authorship in the Top Five: Implications for European Economics

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Abstract: We study to what degree authors who publish in the five most prestigious journals in economics have previously published there and in which world region they are based. Although still high, the concentration of U.S.-based and previously published top-five authors has decreased. This trend is driven by increased co-authorship between U.S. and non-U.S. scholars and between scholars with and without previous top-five articles. Only around 5 percent of all articles each year are written solely by first-time authors from outside the U.S., and this share has not increased since the mid-1990s. Against this background, we argue that European institutions should be wary of putting too much emphasis on publishing in these five journals. Both the advancement and diversity of the economics discipline may otherwise suffer.

Keywords: Bibliometrics, Impact of research, Ranking, Research output, Research productivity.

JEL Codes: A11, A13, A14, B41.

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1 Introduction

In recent years, an important discussion has emerged regarding how research output should be evaluated in academia, including in economics. There are indications that the increased pressure to publish, especially in prestigious journals, distorts the incentives for and thus the behavior of researchers. Some believe this is leading to a decline in the overall quality, relevance and trustworthiness of research (Edwards and Roy 2017; Bauerlein et al. 2010; Belluz et al. 2016).

An essential part of this debate concerns the widespread use of “outlet-based” metrics, such as the *Journal Impact Factor (JIF)*, in order to measure not only the quantity but also the quality of researchers’ output as a basis for decisions on hiring, tenure, and funding. In that case, a paper is not valued on its own merits but rather on where, i.e., in which journal, it is published.¹

In economics, one of the simplest yet most common outlet-based quality metrics is the *top-five journal publication indicator*. This metric only values publications in one of the five most prestigious academic journals of the discipline. These are the *American Economic Review (AER)*, *Econometrica (ECMA)*, the *Journal of Political Economy (JPE)*, the *Quarterly Journal of Economics (QJE)*, and the *Review of Economic Studies (RES)*.² There is a strong consensus among economists that, especially in recent years, publishing in a top-five journal has become increasingly important for attaining positions, tenure, promotions and funding (e.g., Heckman et al. 2017; Hamermesh 2018; Serrano 2018).

This also seems to be the case in Europe. According to Frey (2009), economics departments at numerous European universities quantify research output for the purpose of tenure and promotion decisions, where a top-five publication typically receives three times as much weight as a journal ranked immediately below the top five. Based on conversations with scholars from around Europe, Frey asserts that implicit “publish in A-level journals or perish” requirements are widely spread across academic institutions. In Sweden, for example, some departments that rely on more “mechanical” calculations in their tenure evaluations award more points to articles in the top five compared to other prestigious (such as “top-field”) journals. Although no institu-

¹ The *JIF* is determined by the average number of citations that a journal’s articles get over a rolling time window.

² All journals are based in the U.S. except the *RES*, which is based in Europe.

tion formally demands top-five publications for any position, many of the colleagues at different universities we have consulted assert that top-five publications are given a strong informal weight. This is especially true for appointments to full professor, where decisions are largely based on evaluations by external experts.

Despite the fact that many scholars worry about the consequences of this increased focus on top-five publications, there has been little empirical research so far about how it may have influenced publication patterns. For this reason, examining who publishes in the top five, and how they succeed in doing so, is of general interest and importance to the economics discipline. This paper analyzes two characteristics of authors in the top five: geographic location and past publication history, including the structure of co-authorship in these dimensions. Special emphasis is put on studying trends in these characteristics over the last two and a half decades (1994–2017). Shifts in these patterns, although not direct evidence of behavioral changes from an increased top-five focus, may still be highly suggestive and offer a number of hypotheses for further research.

We show that although still high, the concentration of U.S.-based and previously published top-five authors has decreased significantly. This trend is driven by increased co-authorship between U.S. and non-U.S. scholars and between scholars with and without previous top-five articles. On the other hand, this is to a considerable extent due to the fact that the majority of top-five authors only publish once in the top five during the 24-year period and in most cases they do so together with at least one previously published co-author. Only around five percent of all articles each year are written solely by first-time authors from outside the U.S., and this share has not increased since the mid-1990s. These authors are also often quite senior in terms of lower-tier publications and years since graduating from the PhD program, and many hold a PhD from a U.S. university.

The paper contributes to a growing research literature in economics that studies publication patterns and its determinants, e.g., geographic, institutional and author concentration, life-cycle research output and co-authorship trends.³ It also adds to the

³ For some recent studies see, e.g., Gloetlz and Aigner (2017), who study different forms of article and citation concentration within the economics discipline; Card and DellaVigna (2013) and Hamermesh (2013), who present facts about the articles and authors publishing in the top five; Baghestanian and Popov (2017) and Conley and Önder (2014), who analyze determinants of the early career success of new PhDs.

ongoing discussion on how the discipline should value different types of academic publications and particularly to the debate regarding the focus on top-five articles.

Section 2 surveys earlier research and discussions of the focus on top-five publications in economics and its consequences. Section 3 describes the data we use and Section 4 reports the empirical results. Lastly, in Section 5, we discuss the implications of our analysis for how universities and other institutions, especially outside the United States, value top-five articles relative to other publications and whether they should encourage their researchers to make publishing in the top five a prioritized professional goal.

2 Previous research and discussions on the top-five focus

Empirical research on the importance of top-five publications for the career prospects of academic economists is scarce. But Heckman and Moktan (2018) show that publishing in the top-five journals is more strongly associated with receiving tenure than publishing in other outlets among top departments in the United States.

Moreover, Powdthavee et al. (2018) got around 380 faculty members likely in positions to make human-resource decisions at 44 economics departments in North America, Europe, Asia and Oceania to review hypothetical applicants' publication lists. The authors found that reviewers tend to rank publication lists that include both top-journal articles (including the *QJE* and the *JPE*) and lower-tier articles below lists with the same number of top-journal articles, but without publications in the lower-ranked journals. This suggests that academic peers may put an irrationally high value on publishing – and publishing solely – in the most prestigious journals.

Although it is hard to assess to what extent academic institutions reward researchers who manage to publish in the top five, the competition among scholars to do so has nonetheless increased substantially in the last two decades, especially since the early 2000s.⁴ The number of articles submitted to the top five almost doubled between 1992 and 2012 (Card and DellaVigna 2013), while the number of articles published in the top five per year during that period was relatively stable. As a result, the acceptance rate dropped from ten to five percent, and it has continued to decline, albeit more slowly (Figure A1 in the Appendix).

⁴ Serrano (2018), in a humorous paper about the fictitious disease “top5itis”, also asserts that the strong focus began in the early 2000s.

Is this increased focus on the top five beneficial for or detrimental to the economics discipline? Perhaps it prompts researchers to put more effort into picking the most relevant questions and raise the quality of all studies irrespective of whether they are finally published in a top-five or a lower-tier journal. The top five may also act as gatekeepers to the profession, upholding research reliability and quality. Moreover, the journals could help the profession to screen the best new ideas, making navigating the rapidly growing body of work that composes academic economics easier.

However, the top-five focus has become increasingly criticized. Heckman et al. (2017) raise several arguments against the strong focus on the top five.⁵ Most importantly, whether or not journal articles are published in the top five is an imperfect and possibly misleading measure of article quality (“where” becomes more important than “what”). The top-five emphasis in combination with short tenure clocks is also said to discourage truly creative and path-breaking work that is both risky and slow.

An earlier critic is Frey (2009), who is particularly concerned with how the top-five focus influences the nature of economics institutions and research. He asserts that the selection process of the top five may inadvertently influence researchers to pick topics that turn the profession away from what is socially optimal, and the immense time it takes to write an article publishable in the top five, of which a large part is absorbed by technique and presentation, may be spent more productively.

Some scholars have argued that the top-five focus may be especially detrimental to institutions outside the United States. Deaton (2013) maintains that exporting standards of the top five (and top U.S. schools) to European universities risks creating a uniformity and concentration which threaten diversity and approaches that have evolved locally in response to particular needs and circumstances. Das et al. (2013) show that papers using U.S. data have a much greater chance of being published in the top five instead of in other journals, conditioning on author affiliation and field of study. The focus on the top five may therefore incentivize non-U.S.-based researchers to use U.S. data, leading to less knowledge about other economies. Furthermore, there is an implicit assumption underlying society’s decision to finance economic research, namely that it should further social welfare. However, an extreme focus on publishing

⁵ This is arguably the most well-known critique of the paradigm and refers to a session entitled “Publishing and Promotion in Economics: The Curse of the Top Five”, organized by the American Economic Association in January 2017. The panel consisted of five outstanding economists, four of whom were Nobel Laureates. The seminar can be seen here: <https://www.youtube.com/watch?v=PqdKMqNXM2A>.

in a small number of journals with very similar views on what constitutes high-quality research downplays the need for social relevance and discourages the kind of pluralism that may be necessary to address non-U.S. societies' most pressing issues (Novarese and Pozzali 2010).

The risk of deceitful or outright fraudulent behavior also increases when an ever-increasing number of scholars and papers are entering a race where the number of slots remains largely unchanged. Examples include discarding results not in line with the rest of the article, choosing empirical models that yield the “best” results, deliberately ignoring earlier, similar work to increase the perceived originality of one’s research, and using elegant rhetoric that deludes the reader regarding the true value of the contribution (Edwards and Roy 2017).

Finally, there is reason to question why any particular set of journals should be treated as the top-tier of the discipline. Articles in the top five are on average generously cited, but citations are highly skewed (Gloetzi and Aigner 2017; Hamermesh 2018). The most cited articles in lower-tier journals often have more citations than a fair share of the top-five articles. Thus, the high average citation counts to top-five articles do not guarantee a large impact of every article (Anauati et al. 2018; Oswald 2007).⁶ Moreover, even though the top-five journals are generally in the top (together with a few other journals) of citation-based rankings, journals just below them are also highly cited. In addition, the generous citations to top-five articles can in part be due to a halo effect, where individual articles have a high perceived quality because they are published in the top five.

Taken together, a number of scholars have raised many different issues regarding the focus of institutions on top-five publication and, although hard evidence is limited, the phenomenon has gained further momentum in recent years. An increasing number of scholars also submit manuscripts to the top-five journals despite the low (and declining) acceptance rate.

3 The dataset

The main dataset used in this article contains information collected from *EconLit* on all articles published in the *AER*, *ECMA*, the *JPE*, the *RES* and the *QJE* between 1975 and 2017. Articles in the May issue of the *AER* as well as comments, replies and cor-

⁶ For instance, the five (three) least cited papers published in the *AER* in 2007 had an average of 14 citations in *Scopus* in May 2018. The corresponding average for the five least cited articles in *ECMA* was 4.8 (1.0).

rigenda are excluded to make the articles as comparable as possible.⁷ We also exclude articles with a length of four pages or less, to avoid shorter articles.

For all articles, we have information on the names of the authors, article publication year, and journal. For each author we also know the affiliation (or affiliations), as stated in the article. We have also collected information on the continents of the institutions of the authors and whether the institutions are located in the United States.⁸

The period we study is 1994–2017 (the first year was arbitrarily chosen). The data covering 1975–1993 are used to determine whether an author publishing in a particular year (between 1994 and 2017) has previously published in any of the top-five journals, following each author 19 years back in time from the year of article publication. Authors are identified by their last name and the first letter of their first name.⁹ We only consider articles from previous years when determining if an author publishing in the top five a specific year has also done so previously. Thus, multiple articles in the same year from a first-time author are all treated as a first top-five publication. The motivation is that these articles are likely to have been refereed at the same time, meaning that the author had no previous publication upon submission.

We also manually collected data on all top-five articles from three specific years in the last three decades – 1994, 2004 and 2017 – through *EconLit* and the webpages of the top-five journals. For each author, we then manually collected data from *EconLit* on previous articles in a top-five journal, without putting any restriction (contrary to the main dataset) on years since publication.¹⁰ These data are reported in Appendix B and are used to ensure that our main data do not yield erroneous results due, e.g., to the mistaken inclusion of documents other than journal articles, our page restriction, or our time window for and identification of previous top-five publications.

Table 1 reports how all articles in 1994–2017 are distributed across journals. The *AER* has by far the largest number of articles (around 2,200), followed by *ECMA* (almost 1,400). The other journals all published around 1,000 articles during the studied

⁷ All articles including any of the words “comment”, “reply”, “erratum”, “corrigendum” and “correction” are excluded.

⁸ Throughout the article, we use “affiliation”, “institution” of the author and where the author is “based” interchangeably.

⁹ We have also replicated the analysis using the last name and first word in the first name (thus excluding the latter part of a first name consisting of a combination of more than one name or initial) of each author. This only marginally affects the results and does not alter our conclusions.

¹⁰ Here, we do not impose any page restriction, but we exclude the May issue of the *AER* as well as all short papers (as classified by the journals), notes, comments, and corrigenda to make the journal articles as comparable as possible.

period. The total number of articles published in the top five is just above 6,600, written by around 5,400 unique authors. The authors are fewer than the articles since the effect of multiple authors per article is more than offset by authors publishing multiple times.

To put this into perspective, the number of authors can be related to *RePEc* (Research Papers in Economics), which had 53,000 registered authors who claimed authorship of a publication in May 2018.¹¹ Taken at face value, only one in every ten researchers registered with *RePEc* with at least one publication has thus published a top-five article in the last 24 years. Additionally, there are 13,800 individuals registered lacking publications in *RePEc*. Although the *RePEc* project includes many different types of scholars, this nonetheless shows that the field of economics research is both diverse and populous. On a similar note, Goyal et al. (2006) report that the number of people who have authored at least one work included in *EconLit* increased from 34,000 in the 1970s to 81,000 in the 1990s.

Table 1 Number of articles and authors in the top-five journals 1994–2017.

Journal	1994	2017	1994–2017
<i>AER</i>	85	114	2,231
<i>ECMA</i>	50	64	1,374
<i>RES</i>	37	52	1,035
<i>JPE</i>	49	72	996
<i>QJE</i>	42	40	979
Σ top-five articles	263	343	6,615
Σ top-five articles \times authors	465	793	13,300
Σ unique top-five authors	406	707	5,424

Note: The number of unique authors refers to authors identified by their last name and the first letter of their first name. Articles \times authors instead refers to the number of authors of each article (thus double counting authors who published more than once). Comments, replies, corrigenda, articles in the May issue of the *AER* and articles shorter than five pages are excluded.

Source: *EconLit*.

The results in Table 1 can also be related to the annual number of graduating PhDs in the United States and Europe. Around 1,000 PhDs graduate each year in the U.S. and around 60 percent of these enter academia (Scott and Siegfried 2014).¹² Although data are scarcer for Europe, Eurostat recently published numbers for some EU countries

¹¹ This number has risen steeply in recent years. In early 2009 the number of registered authors was 20,000 (Henrekson 2009).

¹² In 1990–1994, around 900 PhDs graduated each year in the U.S. In 2010–2012, the number had increased to 1,100.

(corresponding to 60 percent of the Enlarged-EU population) for 2015 and 2016.¹³ Assuming these countries are representative for PhDs per inhabitant in the whole union, our best guess is that in the EU each year around 2,000 new economics PhDs graduate.¹⁴ If the share entering academia is the same as in the U.S., there will be some 1,200 new PhDs every year who start building a publication record in Europe.

Frey (2009), among others, has concluded that due to the limited number of top-five article slots it will be virtually impossible for the vast majority of researchers around the world to ever publish in one of the top-five journals. Moreover, when the number of submissions increase, the average quality of referee reports could be expected to decrease. This could also result in aspects such as the ranking of the author(s), the authors' institutions and their personal connections being weighed in more frequently.

Between 1994 and 2017, the total number of top-five articles increased by 30 percent (from 263 to 343).¹⁵ The number of authors (double counting those who published more than once each year) experienced a much larger increase (from 465 to 793; by 71 percent), which implies that the average number of authors per article increased as well (by more than 0.5 authors). This increase in co-authorship may at least to some extent be a response to the fiercer top-five competition.¹⁶ There are also indications that economics departments only partially discount the credit of authorship by the number of co-authors, thus giving strong incentives for researchers to cooperate (see Liebowitz 2014).

4 Empirical Results

We now turn to the characteristics of the top-five authors and articles. The tables and figures in the following sections only report descriptive statistics for all top-five jour-

¹³ See http://ec.europa.eu/eurostat/web/products-datasets/product?code=educ_uoe_grad02 for data on economics PhDs and http://ec.europa.eu/eurostat/web/products-datasets/product?code=demo_pjan for data on the EU population.

¹⁴ Unfortunately, we have not been able to find any data on economics PhDs for other regions of the world.

¹⁵ Taking a longer perspective, however, the number of articles published by the top five peaked in 1980 (Card and DellaVigna 2013).

¹⁶ The number of pages per article in the top five has also increased significantly over time. Card and DellaVigna (2013) argue that this may partly be why the number of articles per year has not (at least not since the 1980s) increased.

nals combined. Descriptive statistics for the individual journals are sometimes discussed and are available in Appendix C.¹⁷

4.1 Authors from different regions

Beginning with institutions and affiliations, Figure 2 shows which continents the top-five authors are based in or affiliated to. The most striking feature is the dominance of authors from North America. Unsurprisingly, the vast majority (95 percent) of these authors are based in the United States. Almost all others are from Canada (among whom it is common to be affiliated with both a U.S. and Canadian institution). However, North American (U.S.) domination has become less pronounced; between 1994 and 2017, the share of North American authors fell from 82 to 65 percent.¹⁸ This was mirrored by an almost commensurate increase in the share of European authors (from 15 to 30 percent). Although the relative increase was almost as large for Asian scholars, they still made up less than 5 percent of all authors in 2017. The share of authors from the rest of the world (South America, Africa, and Oceania) was even lower; a mere 1 percent of all authors in 2017 came from any of these three continents.

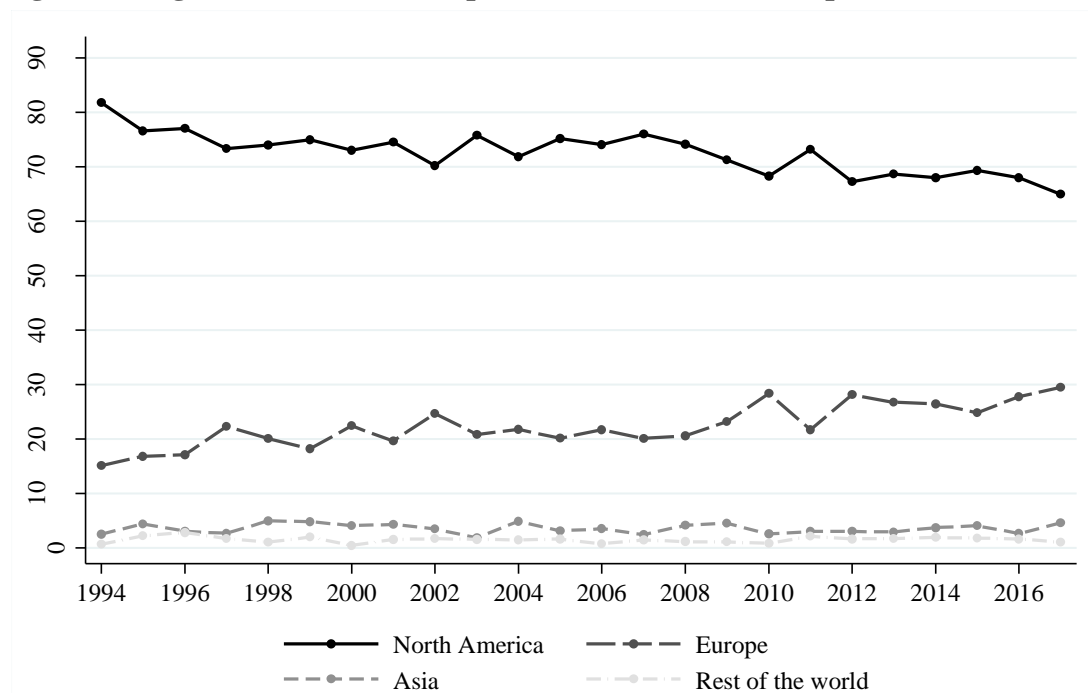
Due to the clear U.S. dominance in the top five, the remainder of this article primarily focuses on whether an author is based at or affiliated with a U.S. institution. We will also treat authors with affiliations to institutions both inside and outside the United States as belonging only to the United States in order to be able to study the extent of co-authorship between U.S. and non-U.S. researchers.¹⁹

¹⁷ We have also constructed alternative versions of all time-series charts where we assign the same weight – one fifth – to all journals in order to account for the fact that the journal composition among top-five articles has changed somewhat over time (see Table 1). Results based on this alternative weighting remain substantively unchanged and are therefore not reported.

¹⁸ A decrease in North American authorship is also documented by Hamermesh (2013), who studies articles in three of the top-five journals. Moreover, he finds that the age of authors and share of female authors increased substantially in these journals between 1963 and 2011.

¹⁹ Around five percent of all top-five authors have affiliations to institutions or organizations on multiple continents. Two thirds of these authors have affiliations in North America and Europe. Furthermore, there is no clear time trend in the share of authors that have multiple-continent affiliations (except for an increased share of all authors during 2000–2005).

Figure 2 Regional affiliation of top-five authors 1994–2017, percent.

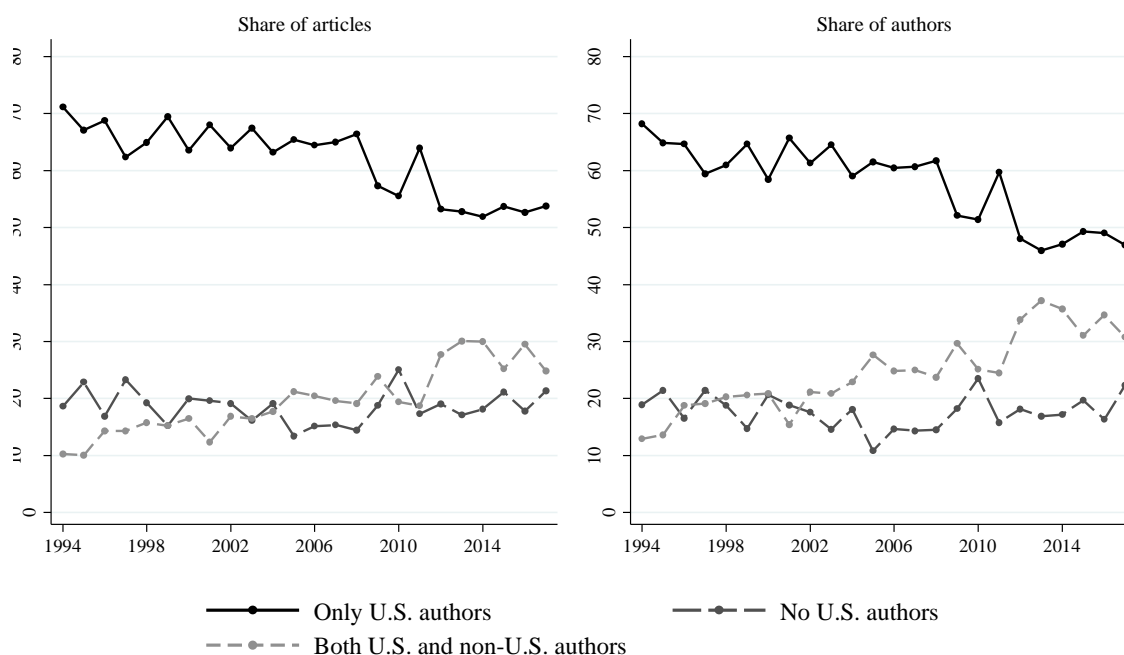


Note: Authors with affiliations from two (three) continents are counted as half (a third) an author for each continent. Russian authors are counted as belonging to Europe (most authors are based in St. Petersburg), and authors from Turkey are counted as both from Europe and Asia. See also Table 1.

Source: *EconLit*.

To better understand the changes over time in authors’ regional affiliation, Figure 3 reports the percentage of all articles (and authors to articles) written only by U.S.-based authors, only by authors based outside the U.S., or both U.S. and non-U.S. authors. As in Figure 2, U.S. author dominance – although still high – has decreased significantly over time; the share of articles solely by U.S. authors declined from around 70 percent in 1994 to 53 percent in 2017. The most important reason for this decline was the increased share (from 10 to 24 percent) of articles where U.S. and non-U.S. authors cooperate. The share of articles written solely by non-U.S. authors has varied somewhat, but there is no clear time trend. Thus, the increase in the share of non-U.S. authors publishing in the top five over time is almost exclusively due to authors from outside the U.S. co-authoring with U.S. researchers.

Figure 3 Share of top-five articles and authors to articles with U.S. and non-U.S. affiliated authors 1994–2017, percent.



Note: Authors with affiliations both inside and outside the U.S. are counted as based in the U.S. See also Table 1.

Source: *EconLit*.

Among the top-five journals, the *RES* had the lowest share (around 40 percent) of only U.S.-authored articles in 2017 (Figure C2 in Appendix C). *ECMA* has not experienced the same downward trend as the other journals but nevertheless had the lowest share of articles by only U.S.-based authors in 1994 and the second lowest in 2017.

Furthermore, 68 percent (not shown in any table) of all articles with only U.S. authors include at least one researcher from one of the “top-12 schools” in the U.S.²⁰ For articles written by authors from both inside and outside the U.S., the share is around 61 percent.²¹ This concentration was also documented by Heckman and Moktan

²⁰ The top-12 schools, as defined by Heckman and Moktan (2018), are Chicago, Columbia, Harvard, MIT, Northwestern, NYU, Princeton, Stanford, UC Berkeley, UCLA, UPenn, and Yale. It is worth noting that the *QJE* is published by Oxford University Press for Harvard’s Economics Department and the *JPE* is published by Chicago University Press.

²¹ See also Kocher and Sutter (2001) for an analysis of institutional concentration in 15 top economics journals (including the top five). The authors find that the PhD institution concentration is stronger than the concentration of current institutions. But there is no clear evidence of favoritism of authors known by editors. For example, Medoff (2003) finds that authors with connections to the editors of six journals (the top five and the *International Economic Review*) publish articles of higher quality (i.e., with more future citations), indicating that editors may set a higher bar for researchers within their own network. Similarly, the analysis in Card and DellaVigna (2017) suggests that reviewers set a higher bar for papers by well-known authors than for manuscripts from less-known researchers.

(2018), who calculated a so-called “incest coefficient” for all top-five journals and top-12 school combinations.²²

There has been an increase in the share of articles that include at least one top-12-school researcher for articles where all authors are from the U.S. (from 58 percent in 1994 to 78 percent in 2017). But such an increase is not seen for articles by both U.S. and non-U.S. authors; that share was around 60 percent during the whole period. The increased co-authorship between U.S. and non-U.S. scholars is thus not explained by non-U.S. authors to a greater extent than before co-authoring with researchers at the top U.S. schools.

4.2 Previous top-five publications and author concentration

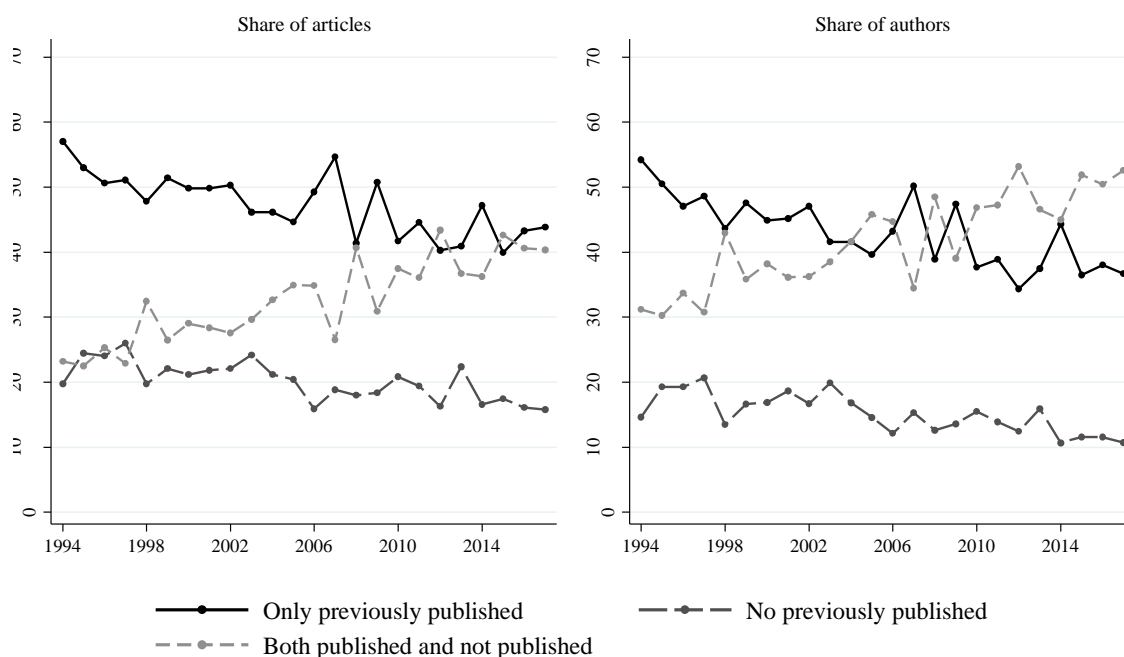
Figure 4 shows that only a small share of all articles published in the top journals each year are written solely by authors who have no previous top-five article (published up to 19 years earlier). This share has also decreased slightly over time (from around 20 percent in 1994 to 16 percent in 2017).

On the other hand, just as with papers written by U.S. and non-U.S. authors, there has been a substantial increase over time (from 23 percent of all articles in 1994 to 40 percent in 2017) in the cooperation between authors who have and authors who have not previously published in the top five. The same trends can be seen when studying the share of authors to articles instead of the share of articles. This shift is most pronounced in the *AER*, the *RES*, and the *QJE*, but can be observed for all the top-five journals (Figure C3).

In part, this is a result of the fact that the average number of authors per article has increased sharply. Nonetheless, researchers who have not previously published in the top five increasingly become top-five authors by joining forces with researchers who have done so already.

²² Based on all top-five articles published between 2000 and 2016, they find that the share of top-12 school authors varies between 48 (*RES*) and 74 (*QJE*) percent.

Figure 4 Share of top-five articles and authors to articles by authors who have or have not previously published in a top-five journal, percent.



Note: The time window for earlier publications is 19 years prior to the year of publication. Authors are identified by their last name and the first letter of their first. See also Table 1.

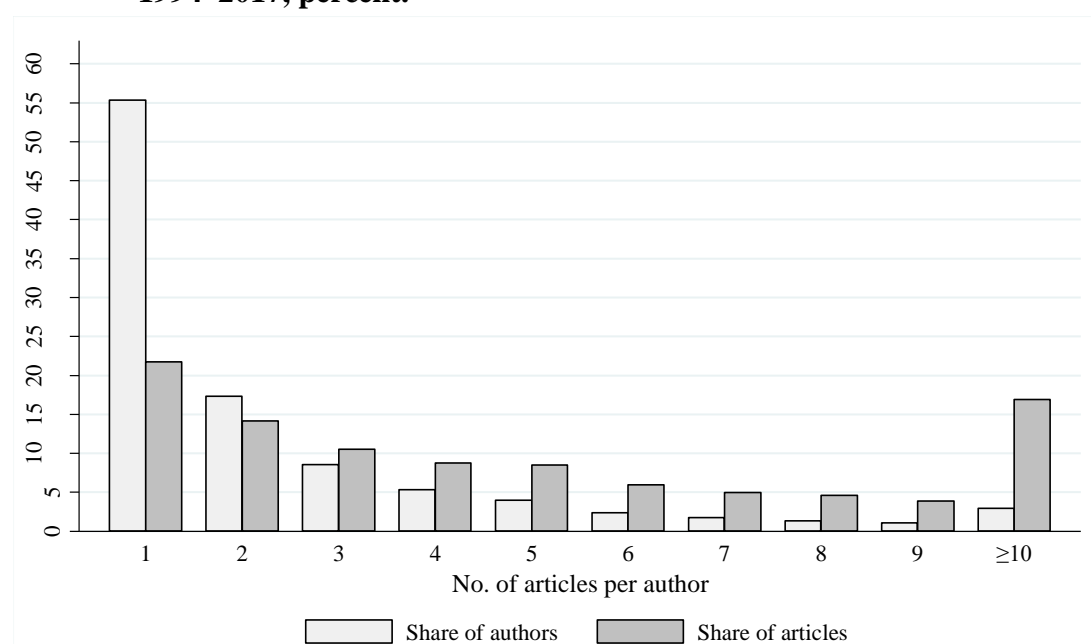
Source: *EconLit*.

Figure 5 shows how all articles in the top five between 1994 and 2017 are distributed across authors, thus providing a measure of author concentration.²³ The first series (for authors) reports the share of all authors who published a specific number of articles regardless of the number of co-authors. The second series (for articles) instead reports the share of all articles that are associated with a particular author group, e.g., authors with one article. Here, the number of articles (on the vertical axis) is adjusted by the number of authors to each article (1/number of authors).

The distribution of articles among authors is highly skewed. More than half of all authors who published in the top five between 1994 and 2017 did so only once. Accounting for co-authorship, this group represents just over one fifth of all articles published during the period.

²³ See, e.g., Cox and Chung (1991) for a similar, earlier analysis of author concentration in the top five and other highly ranked economics journals.

Figure 5 Share of authors and articles by number of articles per author in 1994–2017, percent.



Note: Authors are identified by their last name and the initial letter of their first name. The series for share of articles accounts for the number of co-authors of each article, assigning a value of 1 divided by the number of authors to each corresponding author. See also Table 1.

Source: *EconLit*.

Focusing on the other end of the distribution, around three percent of all authors published ten or more articles in the top five in 1994–2017. Together, these authors wrote 17 percent of all the articles. Thus, a large share of all articles published in the top-five journals were written by a small number of (arguably incredibly) well-published authors.

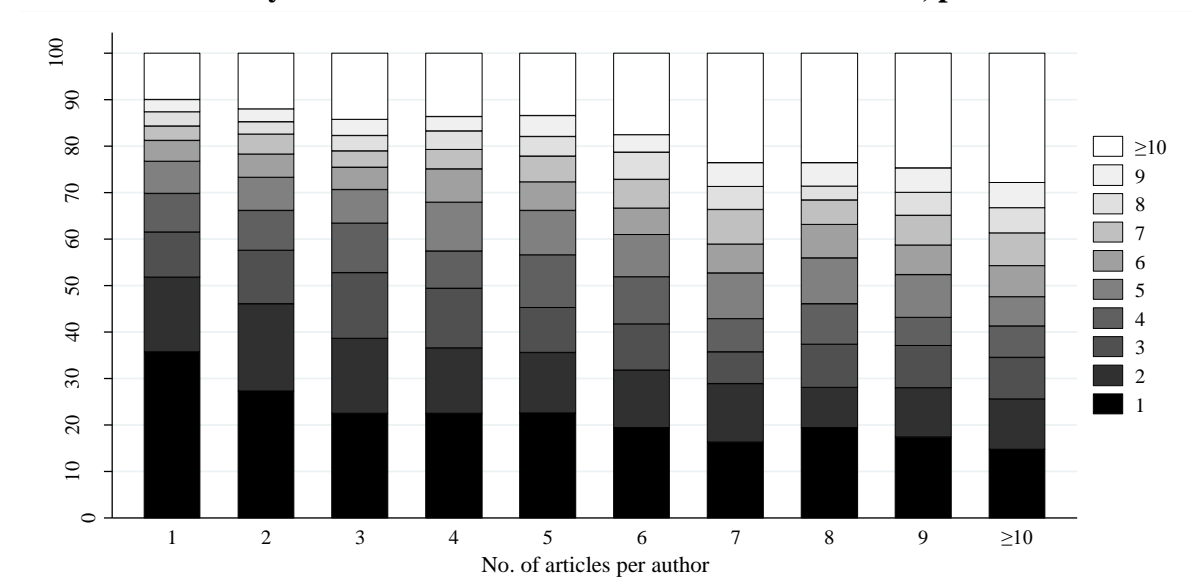
Among these, Daron Acemoglu is outstanding, with 56 top-five articles in 1994–2017 (first publishing in 1996). He is followed by Jean Tirole and John List with 38 and 29 articles, respectively. This is more than the number of top-five articles by the top performers in the two preceding decades. It can also be compared to the life-time achievement of Paul Samuelson (43), Kenneth Arrow (22), William Baumol (36), Joseph Stiglitz (53 articles so far), and Jean Tirole (60 articles so far). Although Acemoglu is still behind Tirole, his track record is quite comparable to the giants of previous generations. However, the top economists in older generations had fewer co-authors on average, and as a result Acemoglu is still clearly behind Samuelson, Stiglitz, and Tirole when we adjust for co-authors. Interestingly, only five of Samuelson’s ten most cited journal articles (according to *Google Scholar*) were published in

a top-five journal.²⁴ Further details and a comparison with earlier decades are reported in Table A1 in Appendix A.

Figure 6 presents the connection between the number of articles published by authors and their co-authors. The figure divides all authors into groups depending on how many top-five articles they published in 1994–2017 (between one and ten or more). The vertical axis instead plots the average share of all authors’ co-authors that have published a specific number of top-five articles in the same period.

Authors who published few articles tended to have co-authors who also published few articles. For example, roughly one third of the co-authors of single-article authors also had only one top-five publication. Likewise, a relatively large share of the co-authors of well-published authors were well-published themselves; more than one in four co-authors of authors with ten articles or more also had ten or more publications.

Figure 6 Average share of co-authors with different number of published articles by the number of articles from author 1994–2017, percent.



Note: First, for each author, the shares of co-authors with different numbers of top-five articles are calculated (e.g., the share of all co-authors of author x who published five top-five articles in 1994–2017). The shares are weighted by the number of times each author wrote an article with a specific co-author. Second, we calculate the mean shares for all authors belonging to a specific author group (e.g., authors with five articles). Authors who only published single-author articles in 1994–2017 are excluded.
Source: EconLit.

This pattern is not unexpected; co-author relationships are not seldom of a long-term nature. It is also likely that researcher pairs or groups managing to publish in the top

²⁴ Two of Samuelson’s ten most cited papers were published in the *Review of Economics and Statistics* (No. 1 and No. 4 in terms of citations), and one each in the *Industrial Management Review*, the *Economic Journal*, and *Economica*.

five are a good “match”.²⁵ At the same time, the relationship between author and co-author articles is far from perfect, and many one- and few-article authors write with more well-published scholars. But the figure nonetheless shows that there is some concentration of co-authorship among the top authors.

4.3 Previous top-five publications by author affiliation

This section studies the interaction among authors between being based in the U.S. and having previously published in the top five. Figure 7 assigns all authors to four different groups depending on whether they are U.S.-based and/or have at least one previous top-five publication.²⁶

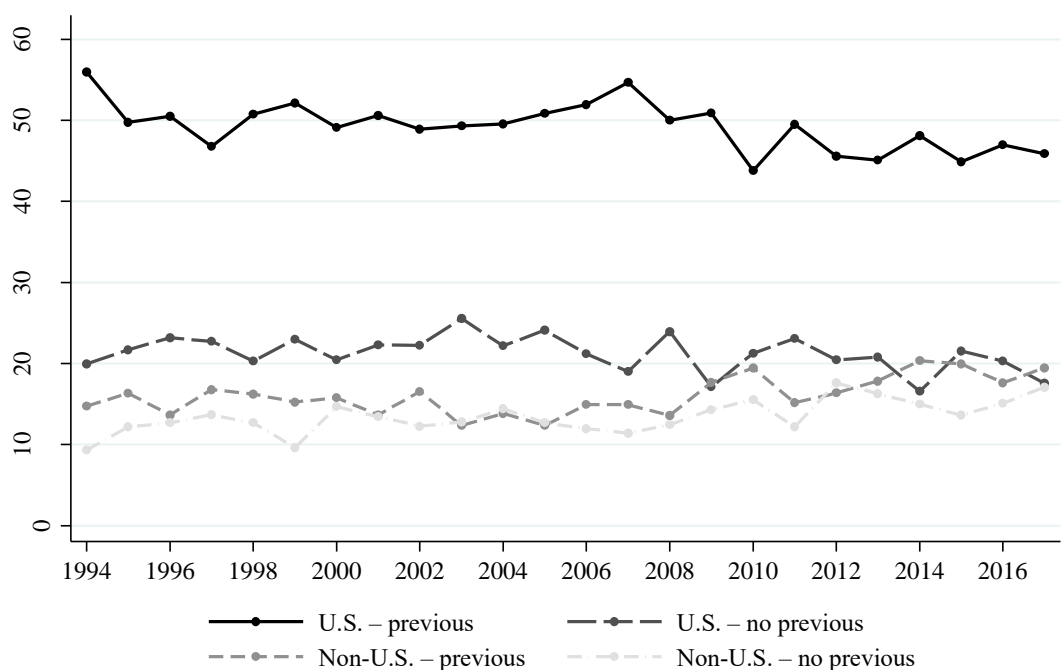
Although the shares for non-U.S. authors both with and without previous top-five articles have increased over time, the relative increase was somewhat larger among those who had no previous publications (for whom the share almost doubled between 1994 and 2017). These increases have been mostly at the expense of U.S. authors with previous top-five articles, whereas the share of first-time U.S. authors has decreased by a mere three percentage points. Overall, this indicates that diversity, in these dimensions, has increased among top-five authors.

Furthermore, first-time U.S. authors represented quite a small share of all top-five authors each year throughout the whole period (close to the shares for non-U.S. authors). Thus, the domination of U.S. authors documented in section 3.1 is mainly due to the large share of senior U.S. scholars publishing a second time or more.

²⁵ In part, this also seems to be an effect of authors cooperating and thereby publishing more top-five articles than authors who co-author to a lesser extent; the relationship between single-author equivalent (1/number of authors) articles of authors and co-authors is somewhat weaker.

²⁶ Being based in the U.S. and having previously published in the top five is to some extent endogenous since researchers may move to and from the U.S. The probability of doing so may be affected by a researcher’s ability to publish in the top five. Our data show that there are indeed some researchers (who published multiple articles) both getting and leaving a U.S. affiliation in the period 1994–2017. But leaving a U.S. affiliation seems to be more common than getting one. This could be due to many individuals from outside the U.S. attaining a U.S. PhD.

Figure 7 Share of top-five authors by previous top-five publications and U.S. affiliation, percent.



Note: See Table 1 and Figures 4 and 5.

Source: EconLit.

Lastly, we are interested in the co-authorship between U.S. and non-U.S. authors who have and have not previously published in the top five. Table 2 reports a detailed breakdown of the published articles and their corresponding authors; all articles are divided into different groups depending on whether all, at least one or none of the authors are U.S.-based and/or have previously published in the top five.

More than one quarter of all articles in 2017 were written solely by U.S.-based authors with previous top-five publications, while the corresponding number for non-U.S. researchers was just over six percent. Although the shares of both these categories have declined over time, the former group experienced a larger fall (from 43 percent of all articles in 1994 to 28 percent in 2017) than the latter. The share of articles written solely by first-time U.S. authors has also declined, while the share of articles written by U.S.-based authors where at least one author, but not all, had no previous publications has been rather stable over time.

Table 2 Share of top-five articles by authors with previous publications in a top-five journal and U.S. affiliations, selected years 1994–2017, percent.

<i>Only U.S. authors</i>	1994	1999	2004	2009	2014	2017
All have previous publications	43.0	38.2	34.0	33.8	27.8	28.4
None have previous publications	14.4	15.7	12.8	9.9	10.0	8.8
Both previous and no previous publications	13.7	15.7	16.3	13.6	14.1	16.7
<i>Only non-U.S. authors</i>	1994	1999	2004	2009	2014	2017
All have previous publications	8.7	6.0	6.9	6.3	5.3	6.1
None have previous publications	5.3	4.8	6.3	5.9	4.4	5.3
Both previous and no previous publications	4.6	4.4	5.9	6.6	8.4	9.9
<i>Both U.S. and non-U.S. authors</i>	1994	1999	2004	2009	2014	2017
All have previous publications	5.3	7.2	5.2	10.7	14.1	9.4
None have previous publications	0.0	1.6	2.1	2.6	2.2	1.8
Both previous and no previous publications, of which:						
– Mainly U.S. author(s) has (have) previ- ous publications	3.0	4.4	7.6	8.5	9.7	9.9
– Mainly non-U.S. author(s) has (have) previous publications	1.9	2.0	2.8	2.2	3.8	3.8

Note: The last two rows of the table refer to articles where the share of authors who have a previous publication is larger among the U.S. than the non-U.S. authors of the article, and vice versa. One article in 2014 had the same share of previously published authors for U.S. and non-U.S. authors (this is impossible for articles with less than four authors) and is not reported in the table. See also Table 1 and Figures 4 and 5.

Source: *EconLit*.

Articles written only by non-U.S. first-time authors made up around one in every twenty articles in 2017, and this share has been quite stable since 1994. The share of articles by non-U.S. authors where at least one, but not all, has previous top-five publications has instead increased markedly (more than doubling between 1994 and 2017). But the total share of only non-U.S. articles has increased distinctly less, because of the decline in articles from solely previously published non-U.S. authors.

A striking result is that U.S./non-U.S. co-authorship is much more important for authors without previous top-five publications from outside (as opposed to inside) the U.S. Of all articles published in 2017, almost 14 percent were co-authored by both U.S. and non-U.S. authors among which at least one, but not all, had previously published in the top five. In more than 72 percent of these cases (10 percent of all articles), it was mainly the U.S. and not the non-U.S. author(s) who had previously published in the top five. This article category also increased the most between 1994 and 2017.

There is also considerable cooperation between previously published U.S. and non-U.S. scholars. Co-authorship between first-time U.S. and non-U.S. researchers is, on the other hand, quite rare (less than two percent of all articles in 2017). This could indicate that U.S./non-U.S. cooperation (when all researchers are not previously published) is not seldom driven by reasons other than mutual research interests. Otherwise, we ought to observe more articles solely from previously unpublished U.S. and non-U.S. scholars. However, it may also be the case that these author groups more often than others refrain from attempting or fail to publish their articles in the top five.

Most of the first-time non-U.S. authors analyzed in this section were from Europe; 30 out of 32 authors who published without the help of senior and/or U.S. scholars in 2017 were based at a European institution. Moreover, 72 out of 103 non-U.S. first-time authors who cooperated with U.S. and/or senior researchers were European. Thus, in total, 102 European researchers published for their first time in 2017.

In Section 3, we estimated that some 1,200 new PhDs enter academia in Europe every year. Assume that the number of first-time European authors in the top five as well as the number of new PhDs entering academia in Europe each year will remain constant in the future. Then, roughly one in every 12 PhD graduates entering academia will be able to at some point in their career publish in the top five. Only one in 40 will do so for the first time on their own or with another non-U.S. first-time author.

4.4 The characteristics of first-time non-U.S. authors publishing on their own

An often-harbored dream of many junior researchers from outside the U.S. is to write a single-authored article based on the best chapter of their dissertation (or an article with another junior researcher), send it to one of the top-five journals, and have it accepted after a relatively quick “revise and resubmit” process. The results in Table 2 indicate that the chance of doing so is indeed slim. And it does not seem to have increased over time. In both 1994 and 2017, only around 5 percent of the articles were written solely by non-U.S. first-time authors.

But who are the researchers from outside the U.S. managing to publish their first top-five article without the help of senior and/or U.S. scholars? To better understand these authors and their “pre-top-five” careers, we have collected information on whether they received a PhD from a school in the U.S., the year when they completed their PhD and the number of journal articles (i.e., not in the top five) they published prior to their first top-five article.

To make the amount of work required collecting the data manageable without risking a nonrepresentative result, we confined the analysis to authors from ten out of the 24 years between 1994 and 2017.²⁷ We also collected data on earlier top-five publications to ensure that no author (or their co-authors) had previously published in the top five, since our time window for earlier publications in the main dataset is only 19 years. Out of 233 authors, 20 are excluded due to this criterion. Additionally, we were unable to obtain the graduation year and/or institution of the PhD for 18 authors.²⁸ Thus, in total, 195 authors are included in the analysis. Figure 8 presents their main characteristics.

Almost 40 percent of this select group of authors had a PhD from a U.S. university. In turn, around 70 percent of *these* authors (27 percent of all authors) graduated from one of the top-12 U.S. schools (see section 4.1). These shares vary substantially from year to year, but there is no clear time trend (panel a).²⁹ Turning to the authors' academic careers, some are clearly quite senior. In all years, the share of authors who had published at least four previous journal articles below the top five exceeded 30 percent (panel c). Likewise, many authors published their first top-five article many years after graduating from the PhD program (panel b). For example, only one in five of all studied authors published in the top five within three years of graduating. Almost 40 percent of the first-time authors graduated eight or more years earlier.

Again, there are no clear time trends. This suggests that there has not been any strong systematic shift in the behavior of non-U.S. first-time authors who manage to publish in the top five in terms of how long they wait before doing so and how many articles they publish through other outlets.

Taken together, Figure 8 shows that the group of first-time authors publishing on their own becomes significantly smaller if we only consider junior scholars who (i) recently finished the PhD program, and (ii) did not do so in the U.S.

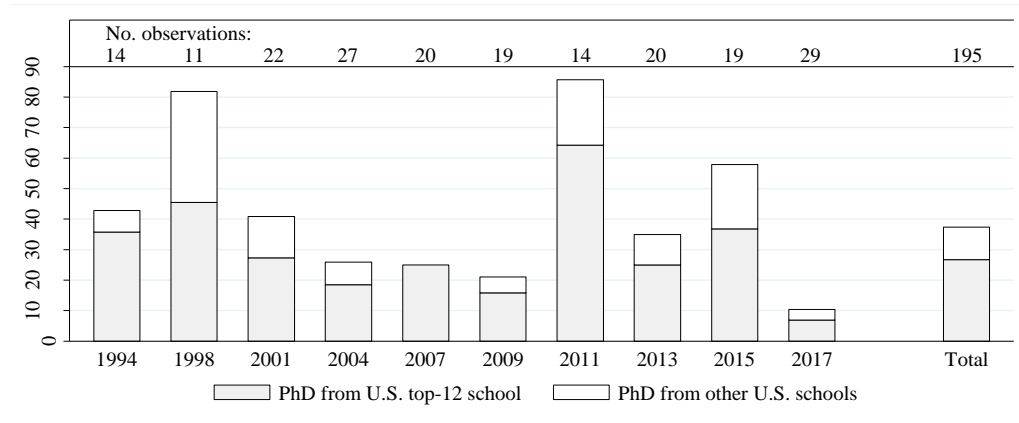
²⁷ Data were collected for the following years: 1994, 1998, 2001, 2004, 2007, 2009, 2011, 2013, 2015, 2017. We chose a larger time span for the earlier than later years since we are especially interested in potential developments in the latter part of the studied period.

²⁸ Three authors do not seem to have graduated from a PhD program at any point.

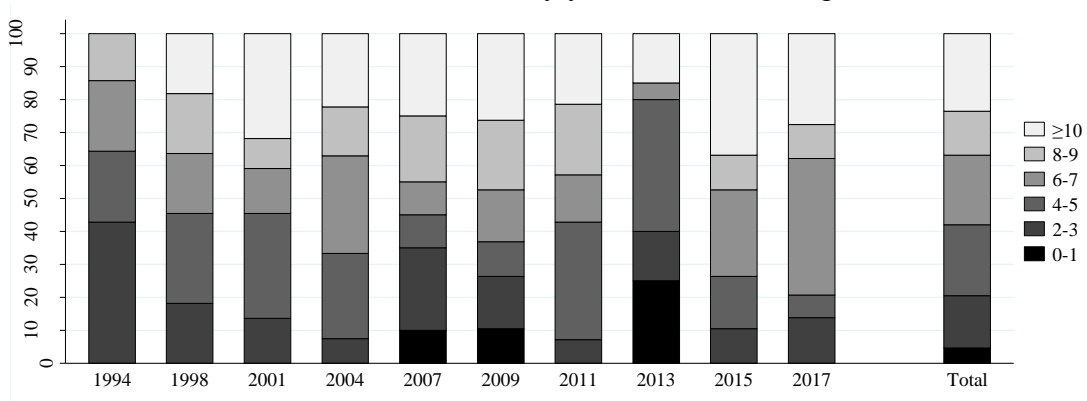
²⁹ Baghestanian and Popov (2017) find that the ranking of the institution at which a young scholar received his or her PhD is a more important predictor of early career success (publishing in prestigious journals) than the rank of the institution of the first placement for authors who eventually became ranked top-100 in *RePEc* in an economics research field. This shows that taking into account the location of PhD studies is necessary to understand our scholars' attachment to the U.S. and to top institutions.

Figure 8 Descriptive statistics for authors of top-five articles by only non-U.S. first-time top-five authors.

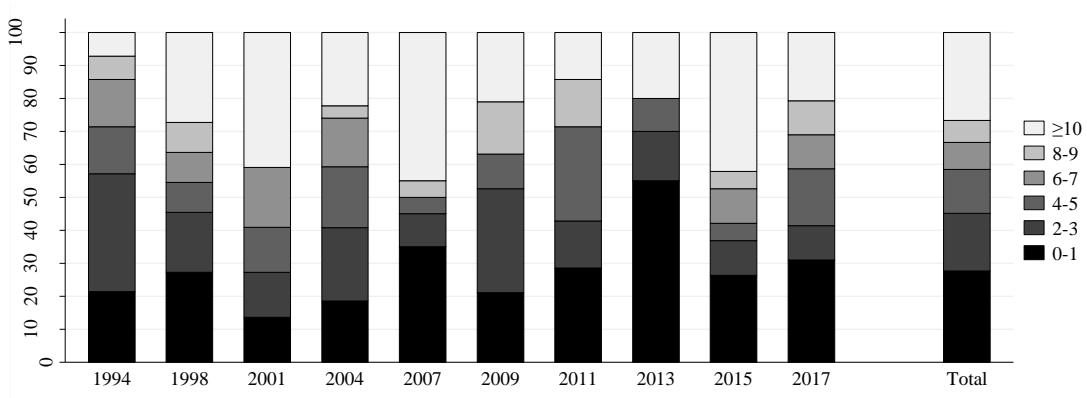
(a) Share with a PhD from a top-12 or other U.S. school



(b) Share of authors by years since receiving PhD



(c) Share of authors by previous number of journal articles



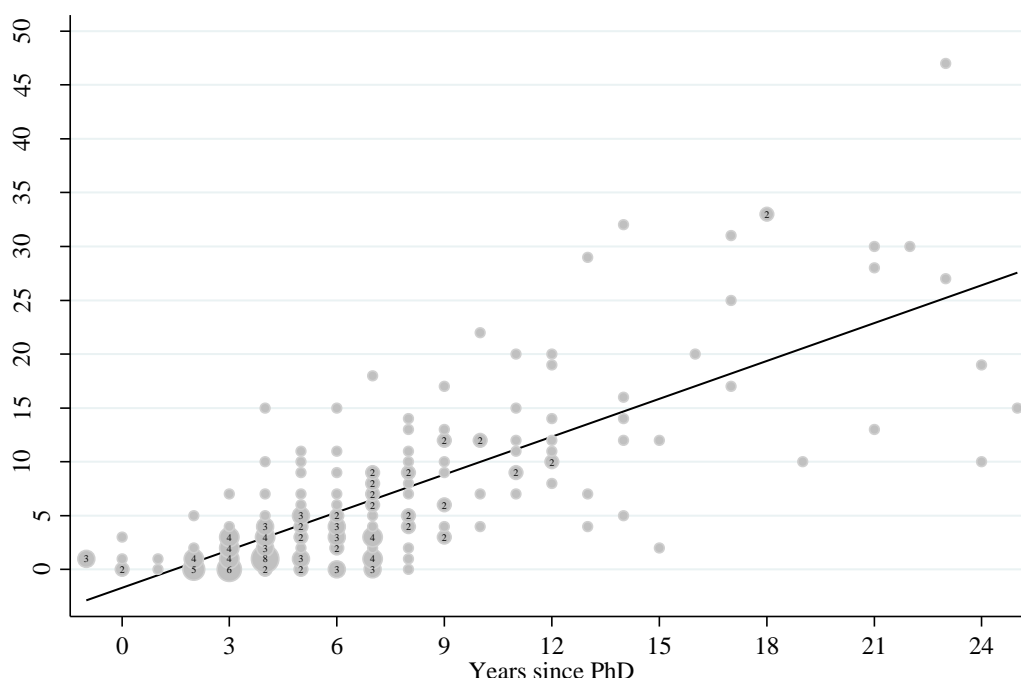
Note: The figure presents descriptive statistics for non-U.S. authors who published for the first time in the top five without the help of previously published and/or U.S. authors. Years since receiving the PhD is defined as the year of the first top-five publications minus the year of graduation. Previous journal articles refer to the number of articles published in journals in *EconLit* prior to the first top-five article. See also Table 1 and Figures 4 and 5.

Source: *EconLit*, *LinkedIn*, *Wikipedia*, and professional websites of the authors.

Figure 9 plots the number of previous journal publications against years since receiving the PhD for all authors. Naturally, there is a positive relationship between the two variables. According to the fitted linear regression line, an extra year since graduation

is associated with having around 1.2 additional journal articles. At the same time, there is much variation in the number of articles conditional on years since graduation. Interestingly, there are quite a few researchers who are well below the expected number of publications and who graduated from a PhD program between two and eight years prior to publishing in the top five. Around 20 of these have no previous journal publications at all. Although the number of observations is small, this indicates that a non-negligible share of authors publishing for the first time in the top five put considerable effort and time into doing so, thereby focusing less on publishing through other outlets.³⁰

Figure 9 Previous journal publications and years since PhD for authors of top-five articles by only non-U.S. first-time top-five authors.



Note: The numbers (2–8) inside the markers (and the marker size) refer to the number of observations with a specific number of articles and years since PhD. Markers without any number represent a single observation. Three authors published in the top five one year before graduating from the PhD program and therefore have negative years since the PhD. See also Figure 8.

Source: *EconLit*, *LinkedIn*, *Wikipedia*, and professional websites of the authors.

³⁰ In general, many PhDs struggle to obtain a sizeable publication record soon after graduation. Studying the number of *AER*-equivalent (using the ranking by Kalaitzidakis et al. 2003) articles from PhD students graduating in the U.S., Conley and Önder (2014) find that only a small fraction (around 10–20 percent, depending on department) of students manage to publish a sufficient number of articles to have reasonable tenure prospects at a medium-level university by the end of their sixth year after graduation. Graduating from a top department is positively related to – but far from ensures – attaining such a publication record. According to Conley et al. (2013), the productivity of new PhDs also declined between 1986 and 2000 (possibly due to larger publication lags and lower journal acceptance rates).

5 Concluding discussion

This article studies certain key characteristics of authors who published in the five most prestigious journals in economics (the top five) between 1994 and 2017. We particularly focus on whether the authors and their co-authors are based in the U.S. and whether they have previously published in any of these journals.

During this period, the journals have been dominated by U.S.-based authors and authors with multiple top-five publications: a mere 15–20 percent (depending on year) of the published articles do not have any author from the U.S., and only 22 percent of all co-author-adjusted articles in 1994–2017 were written by authors who published just once during the period. Moreover, the U.S. dominance is mainly due to the many U.S. authors publishing in the top five for their second time or more.

Authors based in the U.S. publishing in the top journals increasingly work with co-authors from the rest of the world. This has led to a larger share of non-U.S. (almost exclusively European) authors. Likewise, researchers increasingly publish for the first time in the top five by joining forces with senior, previously published scholars. Such cooperation has grown especially important for first-time non-U.S. authors, who often collaborate with senior U.S. researchers.

The increase in the share of first-time authors publishing in the top five may be related to the sharp rise in the mean number of authors per article in recent decades (from 1.8 in 1994 to 2.3 in 2017). A possible cause of the increased U.S./non-U.S. cooperation is that countries other than the U.S. may have interesting, under-utilized data of high quality. Our guess is that, in these co-authorship arrangements, the typically senior U.S. scholar often contributes his or her (largely tacit) knowledge on how to write and get a top-five article accepted, while the non-U.S. scholars contribute data and context-specific knowledge (in addition to a disproportionate share of the work effort).

Although the share of top-five articles with at least one previously unpublished non-U.S. co-author has grown, we observe no increase in the share of articles where no author is either U.S.-based or previously published in the top five; this group represented only one in twenty articles in both 1994 and 2017. These authors are also often quite senior in terms of lower-tier publications and years since graduating from the PhD program, and around 40 percent hold a PhD from a U.S. university. In 2017, this select group decreases from 29 to a mere five persons when considering only relative-

ly young researchers (five or fewer years after graduation) without a PhD from the U.S.

Institutions outside the U.S. should thus bear in mind that – although the top five journals publish many articles each year – only a small share of these include junior co-authors from outside the U.S., and even fewer are written only by non-U.S. researchers who publish in a top-five journal for the first time.

For a non-U.S.-based junior scholar aspiring to publish in the top five at least once, our study suggests that it would typically not be advisable to focus excessively on trying to publish the job market paper in the top five. Instead, the two most realistic strategies appear to be (i) team up with a senior U.S. professor with many previous top-five publications, or (ii) step-by-step work oneself upwards in the journal pecking order, most likely by gradually becoming increasingly recognized as a top scholar in a particular field.³¹

Finally, we would like to point to some issues related to our study, that we believe deserve attention in future research. The high value placed by economists on publishing in the top five has arguably affected the amount of time and effort a large number of scholars in Europe devote to trying to write and publish top-five articles.³² To what extent is this true? And if participation in such a “top-five game” is substantial, is this system optimal from a social point of view? In this context, there are two issues that may be particularly worthy of consideration.

First, does the system discourage academic pluralism (and possibly also productivity) because the choice of research topics (and processes) becomes increasingly governed by the priorities of the editors of the top journals rather than by social relevance? If that is true, it would make research by economists from “peripheral” economies less relevant for domestic policymakers whose policy concerns are not seldom of limited interest among academics in the leading countries (notably the United States).

Second, are the most promising young academics around the world – instead of using their most productive years furthering the discipline – incentivized to polish a

³¹ Support for this strategy is provided by Bellas and Kosnik (2016), who find that a leading position in a field (they look specifically at environmental economics) can just as well be established through publications in the leading field journal. This tendency is stronger for more controversial topics.

³² One indication of the high value placed by economists on publishing in the top five is provided by Attema et al. (2014). They find that in a comparison with living without limbs, economists are, on average, prepared to “sacrifice more than half a thumb for an *AER* publication.”

single or a few manuscripts in excruciating detail far beyond the point where the social marginal return exceeds the social marginal opportunity cost? Given our results this would neither be an efficient strategy in terms of private marginal return and marginal cost for a newly-minted PhD since the chances of success are extremely slim (and have decreased over time). But do junior scholars have a realistic view of the probabilities involved?

We cannot observe how many talented researchers that have decided on their research topic, method and data based on what they guess will be considered attractive by the editors of five specific journals two to three years hence. Nor do we know the number of postdocs and assistant professors around the world who let their future research career be determined by the fate of a few papers, thereby giving disproportionate room for chance and the judgment of a handful of editors. But we do know that junior researchers who follow this route will be grappling with long response lags, demanding revisions, and, except in rare cases, eventual rejections. In this process, many promising scholars risk becoming discouraged and losing their passion for the pursuit of knowledge. We argue that the mere suspicion that junior scholar subscribe to a top-five focus that may have such harmful effects points to an urgent need for systematic research to document the extent of the problem.

In the end, the responsibility to contribute to a diverse, advancing and relevant economics discipline through placing reasonable and well-balanced demands on academics lies with the institutions that hold the key to researchers' future careers (and therefore their behavior). Our study together with concerns raised by an increasing number of highly influential insiders call into question any incentive system that puts too much emphasis on publishing in a few journals, where everyone – from young European PhDs to outstanding U.S.-based professors – wants to publish.

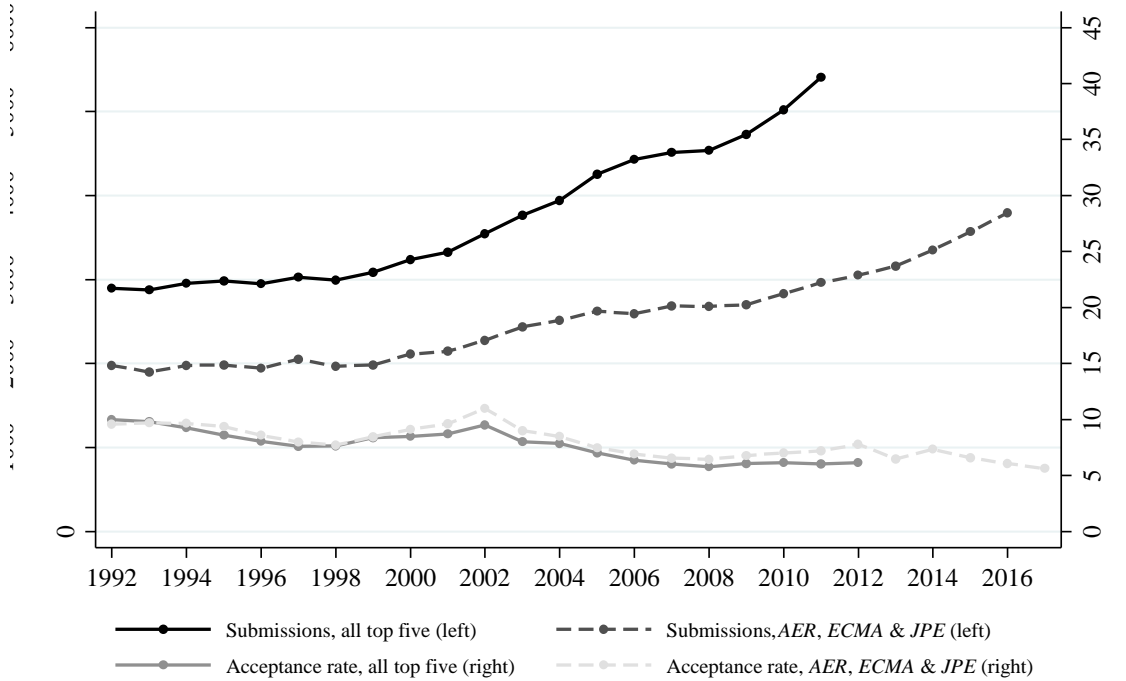
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Appendix A: Additional material

Figure A1 Total number of submitted articles and acceptance rate of the top-five journals 1992–2017.



Note: The acceptance rate (right axis) is calculated as the number of published articles in year t divided by the mean number of submitted articles in years $t - 1$ and $t - 2$. *AER*, *ECMA* and *JPE* (all top five) refer to the total number of publications and acceptance rate for the three (five) journals.

Source: Card and DellaVigna (2013) for the years 1992–2012, and editor reports and webpages (submission data), and *EconLit* (publication data) for *AER*, *ECMA* and *JPE*.

Table A1 The top 10 most published authors in the top five in 1994–2017 and 1975–1993, and all-time achievement by five highly published authors.

Author	Unadjusted	Co-author adjusted (1/n)	Unadjusted per year
1994–2017			
Daron Acemoglu	56	26.8	2.33
Jean Tirole	38	23.7	1.58
John List	29	16.9	1.21
Donald Andrews	25	18.8	1.04
Matthew Jackson	24	11.0	1.00
Richard Blundell	24	8.6	1.00
Timothy Besley	23	11.1	0.96
Steven Levitt	22	13.2	0.92
James Heckman	22	11.9	0.92
Emmanuel Saez	22	9.2	0.92
1975–1993			
Joseph Stiglitz	34	19.3	1.79
Elhanan Helpman	27	18.0	1.42
Jean-Jacques Laffont	26	13.7	1.37
Martin Feldstein	24	19.5	1.26
Jean Tirole	22	12.2	1.16
Peter Phillips	20	16.0	1.05
Boyan Jovanovic	19	13.5	1.00
Lawrence Summers	19	8.8	1.00
Guillermo Calvo	18	13.3	0.95
Jerry Green	18	10.2	0.95
All-time (first–last)			
Paul Samuelson (1937–1988)	43	37.1	
Kenneth Arrow (1950–1979)	22	16.7	
William Baumol (1949–2000)	36	28.5	
Joseph Stiglitz (1967–2004)	53	34.7	
Jean Tirole (1982–2016)	60	35.9	

Note: The top-10 authors are identified based firstly on the unadjusted number of articles and secondly (at the same number of unadjusted articles) by the adjusted number of articles. The time interval for the all-time authors indicates the first and last (most recent for Stiglitz and Tirole) year that the author in question published in a top-five journal. The choice of 1975 as the initial year of the first period was governed by data availability.

Source: *EconLit* and *JSTOR*.

Appendix B: Descriptive statistics for the manually collected top-five articles from 1994, 2004 and 2017

Table B1 Regional distribution of the affiliation of authors in the top-five journals in 1994, 2004, and 2017, percent.

	1994	2004	2017
North America	82.2	75.3	63.1
Europe	15.1	19.2	31.1
Asia	2.6	4.4	4.9
Rest of the World	0.1	1.1	0.9

Note: Authors with affiliations from two continents are counted as half an author for each continent. Russian authors are counted as belonging to Europe (most authors are based in St. Petersburg) and authors from Turkey are counted as both from Europe and Asia.

Source: *EconLit*.

Table B2 Share of articles with U.S. and non-U.S. affiliated authors, percent.

	1994	2004	2017
Only U.S. authors	71.0	61.9	50.3
Both a U.S. and non-U.S. author	11.8	20.6	26.2
No U.S. authors	17.2	17.4	23.4

Note: Authors with affiliations both inside and outside the U.S. are now treated as based in the U.S. See also Table 1.

Source: *EconLit*.

Table B3 Share of articles by authors who have (not) previously published in a top-five journal, percent.

	1994	2004	2017
Only previously published authors	56.1	46.6	40.5
Both previously and not previously published authors	29.0	35.2	44.1
No previously published authors	14.9	18.2	15.4

Note: See Table 1.

Source: *EconLit*.

Table B4 Share of authors by previous publication in a top-five journal and affiliation, percent.

	1994	2004	2017
U.S. affiliation and previous article(s)	55.6	51.2	44.8
U.S. affiliation and no previous article	20.4	22.1	17.5
Non-U.S. affiliation and previous article(s)	15.6	13.6	20.1
Non-U.S. affiliation and no previous article	8.4	13.2	17.5

Note: See Table 1.

Source: *EconLit*.

Table B5 Share of all articles with U.S.- and non-U.S.-based authors who have or have not previously published in a top-five journal, percent.

<i>Only U.S. authors</i>	1994	2004	2017
All have previous publications	41.2	33.6	23.4
Both previous and no previous publications	19.0	17.8	18.5
None have previous publications	10.9	10.5	8.4
<i>Only non-U.S. authors</i>	1994	2004	2017
All have previous publications	8.6	6.9	6.6
Both previous and no previous publications	5.0	4.5	11.9
None have previous publications	3.6	6.1	4.9
<i>Both U.S. and non-U.S. authors</i>	1994	2004	2017
All have previous publications	6.3	6.1	10.5
None have previous publications	0.5	1.6	2.1
Both previous and no previous publications, of which:			
– Mainly U.S. author(s) have previous publications	2.3	8.9	10.1
– Mainly non-U.S. author(s) have previous publications	1.4	2.8	1.7

Note: The last two rows of the table refer to articles where the share of authors who have a previous publication is larger among the U.S. than the non-U.S. authors of the article, and vice versa. No articles have the same share of previously published authors for U.S. and non-U.S. authors (this impossible for articles with less than four authors).

Source: EconLit.

Appendix C: Descriptive statistics for the different top-five journals

Figure C1 Regional differences in the affiliation of authors by top-five journal 1994–2017. percent of all authors.

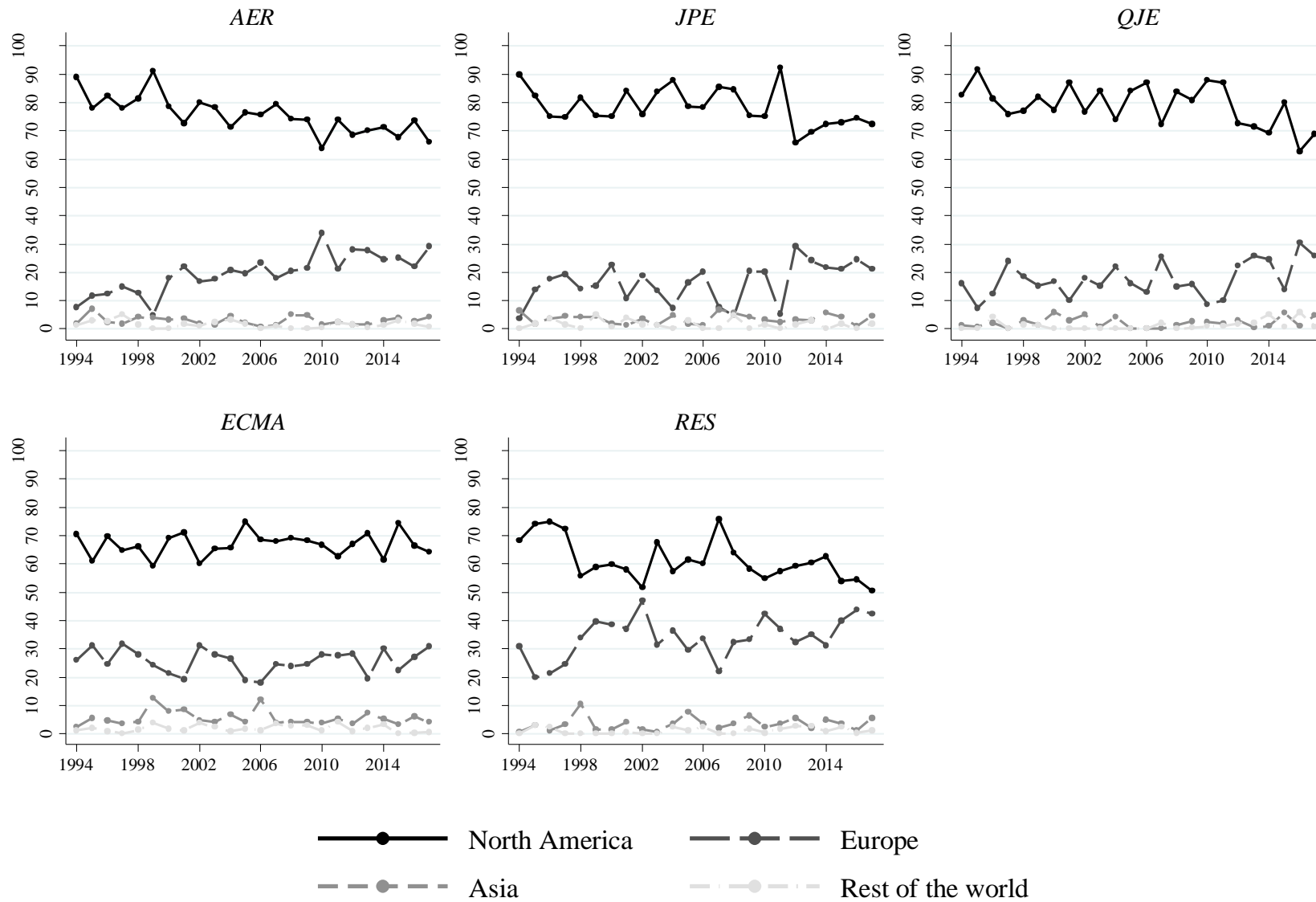


Figure C2 Share of articles with U.S. and non-U.S. affiliated authors 1994–2017 by top-five journal. percent of all articles.

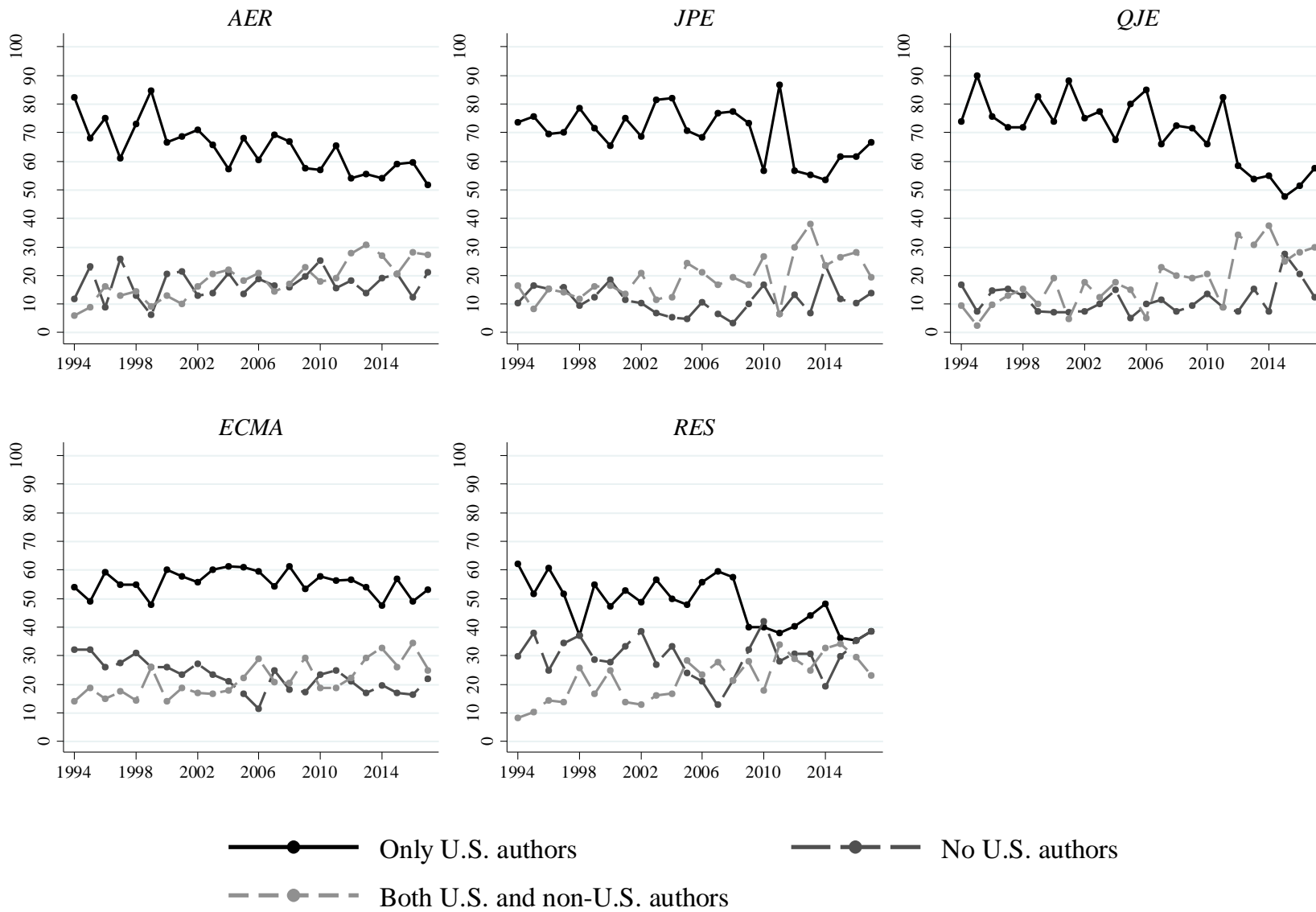


Figure C3 Share of articles by authors who have or have not previously published in a top-five journal by top-five journal, percent.

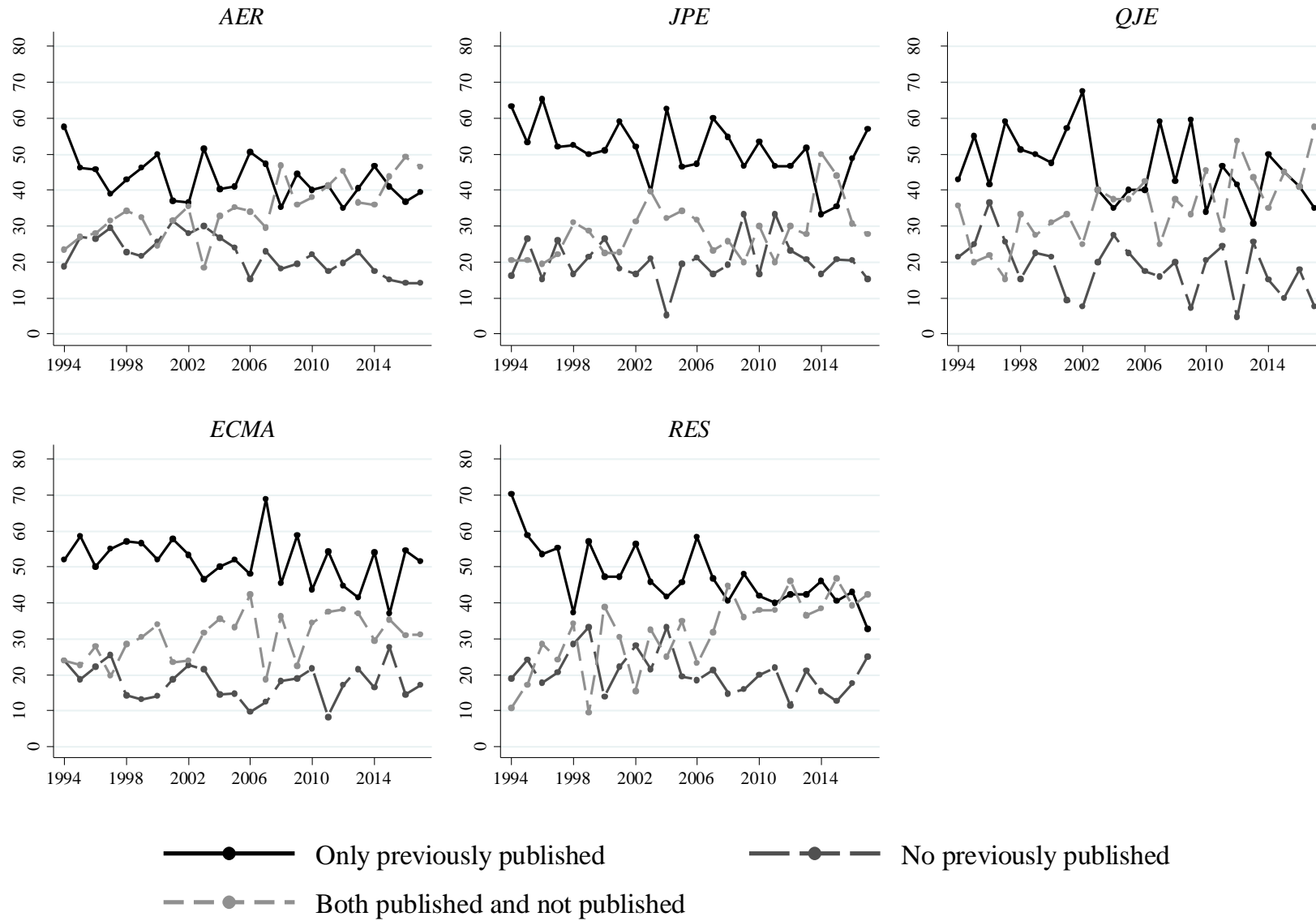


Figure C4 Share of authors by previous publication in a top-five journal and affiliation by top-five journal. percent.

