I Z A Institute
of Labor Economics
Initiated by Deutsche Post Foundation

DISCUSSION PAPER SERIES

IZA DP No. 11976

Early Career Research Production in Economics: Does Mentoring Matter?

Andrés García-Suaza
Jesús Otero
Rainer Winkelmann

NOVEMBER 2018

I Z A Institute
of Labor Economics

Initiated by Deutsche Post Foundation

DISCUSSION PAPER SERIES

IZA DP No. 11976

Early Career Research Production in Economics: Does Mentoring Matter?

Andrés García-Suaza
Universidad EIA

Jesús Otero
Universidad del Rosario

Rainer Winkelmann
University of Zurich and IZA

NOVEMBER 2018

IZA – Institute of Labor Economics

Schaumburg-Lippe-Straße 5–9
53113 Bonn, Germany

Phone: +49-228-3894-0
Email: publications@iza.org

www.iza.org

ABSTRACT

Early Career Research Production in Economics: Does Mentoring Matter?*

We assess the role played by advisory supervision on the early stage productivity of recent PhDs in economics using a tailor-made data set based on RePEc. After allowing for the potential effects of other relevant determinants, including gender and field of specialisation, we find as expected that both advisory quality and rank of the graduation institution are positively related to the academic productivity of graduates. However, students in top institutions do not benefit from working with the most productive academics, unless they become co-authors. For students in non-top institutions, being advised by the best academics is always associated with a higher research output. Possible explanations for this difference can be advising styles, with advisors in top-institutions devoting less time to their advisees unless they are co-authors, or a larger role of learning from peers, relative to advisors, in top-institutions.

JEL Classification: A11, I23, J11, J24

Keywords: academic career, research performance, RePEC, economic research

Corresponding author:
Rainer Winkelmann
Department of Economics
University of Zurich
Schönberggasse 1
CH-8001 Zürich
Switzerland

E-mail: rainer.winkelmann@econ.uzh.ch

* A. García-Suaza and J. Otero are grateful for the financial support received from the Universidad Rosario through the short-term research visits fund. The usual disclaimer applies.

1 Introduction

Early career research production not only helps to determine the long term impact of the research of an academic, but also provides useful information that affects job offers, tenure decisions and promotions in academia. An important factor that may be informative for making accurate predictions about the future performance of young graduates in academia is the education that they received during their doctoral training. Indeed, as indicated by Long and McGinnis (1985), the effects of education on the careers of academics act through two main channels. Firstly, the academic department provides an environment where quality and quantity ingredients foster students' performance during and after their doctoral training. Secondly, since faculty composition within departments is likely to be heterogeneous in willingness and style of advising, a good supervisor can shape abilities through teaching, mentorship and collaboration above and beyond what the department can do. Apart from playing a fundamental role in the transmission of knowledge, the supervisor influences the formation of academic habits, can facilitate access to research networks, and may participate in joint academic projects with the advisee.[1]

The aim of this paper is to assess the extent to which advisory supervision, in addition to overall department quality, has an effect on the early stage productivity of recent PhDs in economics. We define productivity as the quality adjusted number of publications within six years after graduation. Data on publications and supervisor-supervisee relationships are obtained from RePEc, a worldwide project that collects comprehensive information on academics in economics and related areas. The RePEc data link authors with research products (working papers, articles, book chapters and software components), number of citations and, most importantly, specific information on academic genealogy that connects graduates with their advisors. Our main regression results use a sample of 2,223 individuals who obtained a PhD in Economics between the years of 2005 and 2010. Their academic production is observed over a 9-year window, starting 2 years before the completion of their degree, and ending 6 years after that.

This comprehensive data source has a number of advantages relative to those used in the prior literature that often relied on information from surveys or professional associations and were limited to particular regions, fields or departments. First, it allows us to construct more accurate productivity measures for students, advisors and institutions that are superior to rough binary classifications used elsewhere (e.g. Top 30 economics department, Top 250 most productive – or

[1]For a personal perspective on the benefits of academic collaboration with colleagues and students alike, see Baumol (1997).

star – advisor, publication in a Top 5 journal). Here, we focus on specific measures of productivity, namely the number of published articles with and without adjustment by the impact factor of the journal. Second, it is comprehensive regarding region, field and type of employment. This is in sharp contrast to the overwhelming majority of existing studies which exhibit a region bias (for instance, data from US departments, European departments or country-specific; see e.g. Cardoso et al. (2010) and Broström (2018)) or focus on a group of selected universities.[2] Also, it comprises all graduates, including those affiliated to non-academic institutions (such as research centers and multilateral organizations dedicated to academic research), who are not usually considered in similar analyses in economics and other sciences, see e.g. Long and McGinnis (1981). Third, and finally, we can identify specific collaborations between graduates and advisors as co-authors, which will be an important aspect of our analysis.

Due to the tailor-made data set at our disposal, we are able to test two channels through which advisors might have an effect on the research productivity of their students: quality, as evidenced by the advisor's own productivity, and intensive guidance and collaboration, as evidenced by co-authorship. Our empirical analysis is intended to provide insights that are relevant for the design of recruitment processes and also for the establishment of promotion rules. In addition, it could allow prospective graduate students interested in pursuing academic careers in economics to make better informed decisions.

For a preview of our main results, we find that academic productivity of graduates is positively related to both program and advisor quality. While graduates from Top 25 institutions publish on average half a paper less than others (4.7 as opposed to 5.2), they have a close to 100 percent higher productivity when the quality of the journal is accounted for. The effect of advisor quality is more nuanced: in non-Top 25 institutions, the effect is positive independently of whether there is a co-authorship or not. In Top 25 institutions, there is a large return for co-authorship that depends positively on advisor quality. Without co-authorship, the quality of the advisor does not seem to matter for the productivity of graduates from such programs. Empirically, co-authorship rates are substantially lower in Top 25 institutions (25%) than in non-Top 25 institutions (39%). In summary, while graduates from Top 25 institutions are more productive overall in terms of quality-adjusted output, this gap can be reduced by students in non-top institutions, when they are advised by the most productive academics in that program.

While our results are robust to different econometric specifications (OLS or Poisson pseudo

[2]For instance, Cardoso et al. (2010) studies research productivity in labour economics while Hilmer and Hilmer (2007) consider a sample of graduates from Top 30 universities.

maximum likelihood), they do not necessarily imply causality, a limitation that is not specific to our study but applies to most of the literature. For instance, it is likely that more academically gifted students are placed in more selective PhD programs. Hence, the effect of program quality on individual performance may be overstated. Arguably, the self-selection problem is less pernicuous when it comes to the formation of advisor/advisee relationships within a program, as other factors, such as field preferences, introduce an element of randomness. Moreover, from the point of view of predicting future success of graduates in recruiting decisions, or grant funding decisions, our results provide the relevant information: no causal effects are needed when the goal is prediction.

The remainder of the paper is organized as follows. Section 2 provides a short review of the literature. Section 3 describes the data. Section 4 presents the results of our empirical analysis, while Section 5 concludes.

2 Review of the literature

A number of studies have looked into the relative contribution of advisors and academic departments on the publication performance of young academics; see, inter alia, Long et al. (1979), Long and McGinnis (1985), Long (1990) for studies in sciences, and Hilmer and Hilmer (2007) and Cardoso et al. (2010) for the case of economics. These authors confirm that advisors play a major role in the subsequent academic performance of advisees, and that this effect is even stronger when there has been academic collaboration between them. In turn, existing evidence is less clear regarding the quality of graduate programs in economics. For example, Conley and Önder (2014) indicate that only a small percentage of economics PhDs in top-ranked departments are able to achieve a creditable number of publications by their sixth year after graduation. According to the authors, although this finding highlights the difficulties involved in becoming a successful researcher, it also shows that one does not have to attend a top academic department to become successful.

Regarding demographic factors such as gender, Long (1990) observes that collaboration with the mentor is by far the most significant determinant of scientific productivity, and that the opportunities for collaboration are significantly reduced for women by having children. Ginther and Kahn (2004) find evidence that women in economics tend to have lower academic productivity, which in turn affects negatively their chances of obtaining tenure. Hilmer and Hilmer (2007) also find that female students, regardless of the gender of their advisors, have significantly fewer publications early in their careers. On the other hand, Sarsons (2017) observes that men and women who publish solo exhibit similar tenure and promotion rates, conditional on the quality of the papers, but there

is a penalty for women publishing with men. This finding may indicate an implicit bias against women which likely affects not only promotion but publishing success as well. As for an additional demographic factor, Oster and Hamermesh (1998) find that the propensity to publishing in leading journals declines with age, and that the few exceptions are those who were the most productive during the early part of their academic careers.

In related economics literature, Johnson (1997) studies the determinants of the number of citations of academic economists; Laband and Tollison (2000), Ductor et al. (2014), Ductor (2015), Hsieh et al. (2017) and Colussi (2018) assess the effect of networks on academic productivity; Oster and Hamermesh (1998) and Conley et al. (2013) study life-cycle research productivity; Franses (2003) and Fok and Franses (2007) investigate the diffusion pattern of scientific publications; while Heckman and Moktan (2018) examine the relationship between publication in Top 5 journals and receipt of tenure in academic economics departments.

3 Data

The data used in the paper mainly come from Research Papers in Economics, RePEc. RePEc is a collaborative effort of hundreds of volunteers that started in June 1997, under the leadership of Thomas Krichel, with the purpose of enhancing the diffusion of research in economics and related sciences.[3] The main function of RePEc is to organise bibliographic data provided by commercial and academic publishers (using a common format) and make it available in the public domain. Zimmermann (2013) indicates that the considerable amount of data gathered by RePEc has become the most important source of bibliographic information not only for economics but also for other sciences. Indeed, at the time of writing, the RePEc website reports that over 1,900 repositories from 98 countries have contributed more than 2.5 million items of research from journals, working paper series, book (and book chapter) collections, and software components (in the form of usable computer codes). In addition, there are more than 50,000 registered authors, who receive (via email) monthly notifications with statistics on downloads and abstract views of their academic production, as well as some citation notifications. RePEc also enables registered authors to link their academic production with that of their institution(s) and co-authors.

The data collected in RePEc is distributed in a structured way in a number of so-called projects. For the purposes of our research, the most relevant projects are: IDEAS, which contains the bibliographic database; CitEc which offers citation analyses; Edirc which contains a directory of

[3]See *http://repec.org/* for a general description of RePEc, and Zimmermann (2013) for further details on the initiative.

economic institutions with their affiliated researchers and publications; and Genealogy, which can be thought of as an academic family tree for economists (currently listing close to 11,700 registered individuals). A unique identifier, or "RePEc Short-ID" allows merging the information contained in all individual projects.

We use web scraping techniques to retrieve the bibliographic data for all RePEc authors that appear in the Genealogy project, their training institutions and their advisors, from RePEc Genealogy, LogEc and IDEAS, respectively.[4] The total number of articles per registered author provides a simple measure of academic production, but not of its quality. Thus, to adjust for the latter we use the RePEc ranking of economics journals that (as of December 2016) was established using information on the cumulative simple impact factor (defined as the ratio of the number of citations by the number of items in each journal). RePEc data show that the Quarterly Journal of Economics is the top economics journal, and so we use this information to compute the number of Quarterly Journal of Economics equivalent articles, which we shall refer to as QJEe articles for short; see Appendix A for the list of top journals.[5]

Similar measures of quality (or prestige) for institutions and advisors can be obtained using information from RePEc. In the case of institutions, we employ the classification (as of December 2016) which ranks economic departments according to a score based on the harmonic mean of the ranks of a number of different criteria including the number of distinct works, authors, citations, views, and H-index, among others. For the purposes of our empirical analysis, the score of the institutions is normalised between zero and one, where the Department of Economics of Harvard University occupies the first position; the list of Top 25 departments is presented in Appendix B. As for the prestige of the advisors, we construct a measure based on their cumulative QJEe academic production up to four years before the year of graduation of the advisee. Therefore, it ought to be noticed that despite the fact that our econometric analysis is based on cross-section data, the prestige of an advisor changes depending on the moment in time in which they are chosen by the student.

In addition to the bibliographic data mentioned above, it was also possible to obtain information on the gender of the authors registered in RePEc Genealogy (for both advisors and advisees). Since authors are not required to provide their gender during the registration process, we attribute gender through an analysis of names along with a list of exceptions. To this end, we use the Ethnea

[4]The data were obtained in October 2017, using the software R and procedures written by the authors.

[5]Oswald (2007) argues that the prestige of a journal can be viewed as a short-term indicator of the quality of an article. However, in the medium- to long-term the number of citations of the articles provides a better measure of its quality.

application, a computing tool that uses the first name, last name and ethnicity of an individual to predict gender.[6] Thus, for example, it is possible to distinguish between, let us say, Andrea Rossi, most likely a male individual, and Andrea Pérez, most likely a female individual.[7] Lastly, to have an idea of the main field of research of an individual, we use information from New Economics Papers (NEP). NEP is an announcement service created with the purpose of producing reports (generated by subject-specific editors) on new additions to RePEc. Although NEP reports comprise a total of 97 subject categories, for our purposes we opt for grouping them into the classification employed by the Journal of Economic Literature (JEL); see Appendix C for the field classification that we adopted.

The study sample used in our econometric analysis consists of individuals who, according to the RePEc Genealogy project, graduated between the years of 2005 and 2010. This amounts to a total of 2,223 (out of the 11,700) individuals for whom we consider their academic production over a 9-year window which starts 2 years before the completion of their terminal degree, and ends 6 years after that. This window length is consistent with earlier results by Conley et al. (2013) who find that graduates in economics achieve the peak of their academic productivity between around the fifth and seventh years after graduation. To validate this finding using RepEc data, we consider a modified version of the sample based on the research output between -2/+9 years after graduation for graduates between the years of 2002 and 2007.[8]

– – – – – – – – – Figure 1 about here – – – – – – – – –

Figure 1 displays the yearly academic production of graduates of the 2002-2007 cohorts. As can be seen, the maximum level of productivity is achieved after 6 years of the terminal degree. The same conclusion can be reached when the number of articles is expressed in terms of QJEe articles; see panel b) of Figure 1.

4 Empirical analysis

Our empirical analysis revolves around the question of whether, and how much, advisor quality and/or quality of the economics doctoral programs affect academic production during the first six years after the completion of the terminal degree. To provide some preliminary evidence, Figure 2

[6] See *http://abel.lis.illinois.edu/cgi-bin/ethnea/search.py*.

[7] In about three hundred cases there were uncertain matches, which were all resolved through internet search of the authors' websites.

[8] Using 2017 data, it is not possible to compute academic production beyond 7 years for members of the 2005 to 2010 graduation cohorts.

plots the average number of articles six years after graduation against advisor quality, where the latter is measured in quintiles (error bars denote 95% confidence intervals). As can be seen, the average number of articles does not appear to vary by the quality-quintile of the advisor.

– – – – – – – – – Figure 2 about here – – – – – – – – –

However, a very different picture emerges when the number of articles is adjusted by quality, i.e., expressed in terms of QJE-equivalent papers, as is seen in panel b) of Figure 2. In this case, there is a clear positive relationship between the number of QJEe articles six years after graduation and advisor quality.

There are two possible channels through which advisors can have an effect on the productivity of advisees. One is directly through co-authorships, the other is indirect through passing on know-how of doing academic research. To disentangle these two channels, we display in panel b) of Figure 2 also the relationship between advisor quality and the number QJEe articles net of those co-authored with the advisor. The positive relationship identified earlier is largely unaffected. Besides, there does not appear to exist an association between the probability of co-authorship and the prestige of the advisors.

Next, we consider evidence on the relationship between research performance of graduates and institution quality. We distinguish two groups of institutions, namely those ranked in the Top 25, and the rest. Figure 3 shows that when one looks at the number of articles, graduates from top institutions tend to publish somewhat less than their counterparts from the rest of institutions (error bars denote 95% confidence intervals). But in terms of quality-adjusted publications, graduates from the Top 25 institutions publish about twice as much as their counterparts (see the lower panel of Figure 3). In sum, this preliminary evidence supports the view that both institution and advisor prestige are important determinants of early research performance among academic economists.

– – – – – – – – – Figure 3 about here – – – – – – – – –

4.1 Results from a linear regression model

To disentangle the contributions of advisor quality and that of economics departments, we estimate several regression models for the determinants of early academic production. We specifically consider two outcomes of interest, namely: the total number of QJEe articles (*ArtQJEe*), and the total number of articles net of those co-authored with the advisor (*ArtQJEeNet*). The latter allows us to assess whether the effect goes beyond the co-working between advisor and advisee, which

is most likely related to the capability of the advisor to foster research abilities of the graduate. For each individual in the sample, both *ArtQJEe* and *ArtQJEeNet* are computed within the 9-year window (including the year of graduation). The regressions include a cumulative measure of quality-adjusted academic production by the advisor at the moment he/she is chosen by the advisee, which is assumed to have occurred four years before graduation year (*AdvQJEe*), a normalised measure of the quality of the economics department (*UniRank*) which is a continuous variable in the unit interval based on the (December 2016) RePEc classification, where 1 is the top economics department (the value for those departments that are not included among the Top 25 is set equal to zero), a variable that measures advisor tenure given by the number of years since the advisor's first published article (which enters the models both linearly and quadratically, denoted by *AdvTenure* and $AdvTenure^2$, respectively), and additional (indicator dummy variable) controls to account for whether or not advisor and advisee have co-authored articles (*Coauthorship*). Further regressors are a set of gender interaction terms (*Male*×*AdvFemale*, *Female*×*AdvMale*, *Female*×*AdvFemale*), as well as 17 dummies for the academic field of interest (*Field*). The regression intercept gives the predicted publication output for the group against which comparisons are made, namely male student with male advisor, specialised in JEL field A (i.e., General Economics, Teaching), and without co-authored articles with advisor.

– – – – – – – – – – Table 1 about here – – – – – – – – – –

Before presenting the regression results, Table 1 provides some descriptive statistics of the variables, separately for students who obtained their terminal degree from a Top 25 institution and those who did not. As previously discussed, there is no substantial difference in the number of articles published by students from Top 25 institutions as compared to the rest; however, noticeable differences are found when the comparison is based on measures adjusted by quality (i.e., 0.922 and 0.497 QJEe articles on average respectively for Top 25 institutions and the rest).

With respect to advisor quality, the average number of QJEe articles in Top 25 institutions is about three times the average observed in the rest of institutions (8.6 and 3.0, respectively). Although researchers in top institutions tend to be more productive on average, there are also highly productive individuals in the rest of institutions, as illustrated in Figure 4. In terms of co-authorship with the advisor, the percentage of students who do so in top institutions is lower (24.5%) than that observed in the students from non-top institutions (38.5%). The average number of years of experience of the advisors is about the same regardless of the quality of the institution. Lastly, almost 95% of the students in the sample are advised by a male professor. Around 20% of

the graduates are female.

– – – – – – – – – Figure 4 about here – – – – – – – – –

Table 2 reports OLS regression results where the dependent variable is the number of QJEe articles. As can be seen, when one uses all available observations (column (1)) both the prestige of the advisor (*AdvQJEe*) and that of the economics department (*UniRank*) have a positive and statistically significant effect on the quality-adjusted measure of academic production after 6 years of graduation. The point estimates are about equal meaning that, ceteris paribus, the effect of a one-rank decrease in program quality can be offset by having an advisor with one additional QJEe article.

The tenure (years of expertise) of the advisor has an inverted U-shaped effect (with a maximum point occurring at about 10 years of experience). Co-authorship with the advisor also has a positive and statistically significant effect, but it is less than one, both because there may be some crowding-out of own papers and because we consider here quality adjusted publications, with an overall mean of 0.6. Female graduates publish fewer papers than their male homologues, but for a given advisee, the difference between male and female advisors is statistically insignificant, a finding similar to that of Hilmer and Hilmer (2007).

To capture potential heterogeneous effects of advisor quality conditional on institution quality, we use the aforementioned distinction between Top 25 economics departments and the rest. This differentiation reveals an interesting pattern. Indeed, although in the case of Top 25 institutions (column (2)) the advisor prestige is not statistically significant, co-authorship plays a role in the student academic productivity. One potential explanation is that the faculty composition in terms of research quality tends to be more homogeneous in these institutions, while a more heterogeneous composition exists for economics departments in lower ranks.[9] In addition, it might be the case that peer effects are stronger in top institutions, driven by higher quality students interacting in a better environment (e.g., high quality workshops and reading groups). The large magnitude of the effect of co-authorship on academic production in the Top 25 might also be explained by the network channel of the advisor, as has been suggested by Colussi (2018).

In sharp contrast, when one estimates the model using the observations for the rest of the institutions (column (3)), the point estimate of advisor quality is statistically significant and about three times that obtained for the full sample, while the prestige of the economics department

[9]Qualitatively similar findings, not reported here for brevity but available upon request, are obtained for the Top 50 institutions.

becomes insignificant. These findings might be seen as providing support for the view that bright students in non-Top 25 institutions might still be able to achieve a successful research record though their (close) interaction with the most productive faculty members. Including the interaction between the number of QJEe articles produced by the advisor with the dummy of advisor co-authorship ($AdvQJEe \times Coauth.$) as an additional regressor yields a statistically significant positive coefficient, which appears to be capturing the explicative power of $AdvQJEe$ whose coefficient becomes insignificant; see columns (4) to (6). Other estimates remain about the same.

To quantify the relevance of advising as a determinant of academic productivity, we use the estimates in columns (5) and (6) of Table 2 to compute the effect of having different advisor quality in a given environment. In particular, we estimate the differentiated effect on academic production of having a top quality advisor compared to the case of an "average" one, within a framework in which both advisor and advisee are co-authors. To this end, we assume a top advisor is one for whom $AdvQJEe$=14.8; this is the average number of QJEe articles associated to the Top 20 advisors in the Top 25 economics departments in the sample. As a benchmark, the average number of QJEe articles for an "average" advisor is assumed to be equal to $AdvQJEe$=4.4, which is consistent with the average value observed in all the sample. The resulting estimated change in academic production for a graduate from a Top 25 institution, maintaining everything else the same, is 0.4 (with a standard deviation of 0.07). Performing the same counterfactual exercise for a student from the rest of departments, the change in academic production is estimated to be equal to 0.63 (with a standard deviation of 0.13). When compared to the average number of quality-adjusted papers ($ArtQJEe$=0.60), these changes in academic production amount to approximately 67% and 104%, respectively. Conducting a similar counter-factual exercise under the assumption that advisor and advisee have not co-authored papers, the change in quality-adjusted production is -0.036 (with standard deviation of 0.07) for a Top 25 economics graduate, and 0.31 (with standard deviation of 0.13) for the rest. This finding highlights that the advisor's influence on students through their direct cooperation is pretty important.

Of course, the effect of co-authorship on output is partly mechanical, because it requires at least one publication by the graduate. As an alternative, we consider in Table 3 results when the dependent variable excludes the number of QJEe articles co-authored with the advisor. The estimated coefficients are qualitatively similar to those reported in Table 2. For example, in the case of the gender interactions, the estimated coefficients are all negative and in several cases statistically significance. Likewise, the main conclusion regarding the contributions of institution

and advisor quality on academic productivity continue to hold (see columns (5) and (6)); that is, the former has a positive and statistically significant effect for Top 25 institutions, while advisor quality is important among the rest of the institutions. Interestingly, although the individual effect of *Coauthorship* in a Top 25 department is statistically insignificant (i.e., -0.048 with a standard error of 0.114), when it is interacted with *AdvQJEe* the overall effect becomes positive for given advisor quality values above 3 QJEe articles (recall that the average value of *AdvQJEe* within Top 25 institutions is 8.6 QJEe articles).

4.2 Poisson-pseudo maximum likelihood results

While the number of articles published is a proper count, the number of QJE-equivalent articles is not. Yet it shares two key aspects of a count, a discrete probability mass at zero and a necessarily non-negative mean. In such a situation, it is useful to consider an exponential regression model, $\mathrm{E}(y_i|x_i) = \exp(x_i'\beta)$. In contrast to OLS, this approach always yields non-negative predictions, and moreover is easy to interpret as the coefficients are (constant) semi-elasticities.[10] In principle, a number of consistent estimators of the parameters of the exponential conditional expectation model are available, including non-linear least squares. Here, we shall follow the advice of Santos Silva and Tenreyro (2006) who, based on an extensive set of Monte Carlo simulations, recommend using the Poisson pseudo-maximum likelihood (PPML) estimator, which implies an unweighted zero-correlation moment condition between the residuals and the covariates.

The results of applying the PPML estimation procedure to the quality-adjusted measure of academic production are summarised in Table 4, where columns (1) to (3) display the results when using *ArtQJEe* as dependent variable, while (4) to (6) present those for *ArtQJEeNet*. For example, based on column (1), a coauthorship increased the number of QJE equivalent papers by 28.4 percent, ceteris paribus. We also find that the quality of the economics department (*UniRank*) has a positive and statistically significant effect, with a point estimate that is much smaller for the Top 25 departments than for the rest of them. The number of QJEe papers of the advisor is positive and statistically significant only for the rest of departments. Gender interactions, when statistically significant, have a negative effect on the number of QJEe articles of students, regardless of whether the number of articles co-authored with the advisor are deducted or not. The PPML results regarding the differential role of advisor quality in the two groups of institutions remain

[10] As pointed out by Santos Silva and Tenreyro (2006), estimating a linear regression model on the log-transformed dependent variable is not advisable, first because it cannot deal with zero outcomes (for *ArtQJEe*, approximately 10% of the cases are zeros), and second, because parameters can be interpreted as semi-elasticities only under very strong independence assumptions (e.g. the absence of heteroskedasticity) that are often violated in practice.

stable. Also, although the point estimates of *UniRank* are now positive and statistically significant for both Top 25 and the rest of institutions, the associated semi-elasticity is much larger for the top institutions (i.e., 0.259 as opposed to 0.074).

One thing to check for a PPML specification is whether or not the conditional variance $V(y_i|x)$ is proportional to the conditional expectation $E(y_i|x)$, i.e., $\lambda_1 = 1$ in $V(y_i|x) = \lambda_0 E(y_i|x)^{\lambda_1}$. While proportionality is not necessary for the consistency of the estimator, other methods would be more efficient if it failed in the application. We therefore report at the bottom of Table 4 results for Gauss-Newton regression (GNR) test (see Santos Silva and Tenreyro (2006)). In a few instances, the null of proportionality is rejected, but mostly it holds (see in particular also Table 5). We also estimated models with a quadratic variance function but since the results were qualitatively similar, they are not reported here.

Thus far, our empirical analysis has been unequivocal in terms of relevance of advisor and institution quality on total academic production, and also with respect to the differentiated effect for groups of economics departments. However, every now and then one ends up discussing with colleagues the potential benefits between publishing a high number of articles as opposed to publishing only a few ones in top journals. To examine this, we transform the dependent variable y_i so that it is no longer continuous, but a count that measures the number of articles published in a Top 25 journal. It ought to be remembered that the specific ranking of journals that we use is also constructed from RePEc, based on a simple index of the ratio between number of citations and number of published articles; see Appendix A. Once again, the parameters of the model can be estimated using PPML, because of the fact that the values of the resulting dependent variable are non-negative integers. The results, reported in columns (1) to (3) of Table 5, reveal that the quality of the advisor is not statistically significant for students from Top 25 institutions but for those from the rest. Co-authoring with the advisor increases the chances of publishing in a Top 25 journal, regardless of whether one is considering a student from a Top 25 economics department or not. As for the quality of economics department, it is significant for Top 25 institutions but not for the rest. However, when the coverage of the dependent variable is doubled in size so that it is now defined as the number of publications in Top 50 journals (columns (4) to (6)), then the quality of economics departments become positive and statistically significant for both Top 25 institutions as well as for the rest of them. The point estimates for gender interactions are negative and statistically significant for female students who worked with male advisors. Finally, the GNR test reveals that the proportionality condition of the conditional variance is valid in all estimated models.

5 Concluding remarks

The key finding of our study is that the negative effect of attending a less prestigious PhD program can, at least in part, be compensated for by the benefit of working with a research-active and successful advisor. One potential explanation for this finding is that advisors in top-ranked departments are very busy and have less time to spend with their advisees, as compared to supervisors in lesser ranked departments. For some supportive evidence, note that the co-authorship rate in Top 25 institutions is 24.5 percent, and thus substantially lower than the 38.5 percent in other departments. From the perspective of the students, it may well be that there is a true choice to be made between being a "small fish in a big pond" or rather being a "big fish in a small pond".

References

Baumol, W. J. (1997). On the pleasure and gains of collaboration. *The American Economist 41*(1), 15–21.

Broström, A. (2018). Academic breeding grounds: Home department conditions and early career performance of academic researchers. Technical Report 465, The Royal Institute of Technology. Centre of Excellence for Science and Innovation Studies (CESIS).

Cardoso, A. R., P. Guimarães, and K. F. Zimmermann (2010). Comparing the early research performance of PhD graduates in labor economics in Europe and the USA. *Scientometrics 84*(3), 621–637.

Colussi, T. (2018). Social ties in academia: A friend is a treasure. *The Review of Economics and Statistics 100*(1), 45–50.

Conley, J. P., M. J. Crucini, R. A. Driskill, and A. S. Önder (2013). The effects of publication lags on life-cycle research productivity in economics. *Economic Inquiry 51*(2), 1251–1276.

Conley, J. P. and A. S. Önder (2014). The research productivity of new PhDs in economics: The surprisingly high non-success of the successful. *Journal of Economic Perspectives 28*(3), 205–16.

Ductor, L. (2015). Does co-authorship lead to higher academic productivity? *Oxford Bulletin of Economics and Statistics 77*(3), 385–407.

Ductor, L., M. Fafchamps, S. Goyal, and M. J. van der Leij (2014). Social networks and research output. *The Review of Economics and Statistics 96*(5), 936–948.

Fok, D. and P. H. Franses (2007). Modeling the diffusion of scientific publications. *Journal of Econometrics 139*(2), 376–390.

Franses, P. H. (2003). The diffusion of scientific publications: The case of Econometrica, 1987. *Scientometrics 56*, 29–42.

Ginther, D. K. and S. Kahn (2004). Women in economics: Moving up or falling off the academic career ladder? *Journal of Economic Perspectives 18*(3), 193–214.

Heckman, J. J. and S. Moktan (2018). Publishing and promotion in economics: The tyranny of the Top Five. NBER Working Papers 25093, National Bureau of Economic Research.

Hilmer, C. and M. Hilmer (2007). Women helping women, men helping women? same-gender mentoring, initial job placements, and early career publishing success for economics PhDs. *American Economic Review Papers & Proceedings 97*(2), 422–426.

Johnson, D. (1997). Getting noticed in economics: The determinants of academic citations. *The American Economist 41*(1), 43–52.

Laband, D. N. and R. D. Tollison (2000). Intellectual collaboration. *Journal of Political Economy 108*(3), 632–661.

Long, J. S. (1990). The origins of sex differences in science. *Social Forces 68*(4), 1297–1316.

Long, J. S., P. D. Allison, and R. McGinnis (1979). Entrance into the academic career. *American Sociological Review 44*(5), 816–830.

Long, J. S. and R. McGinnis (1981). Organizational context and scientific productivity. *American Sociological Review 46*(4), 422–442.

Long, J. S. and R. McGinnis (1985). The effects of the mentor on the academic career. *Scientometrics 7*(3-6), 255–280.

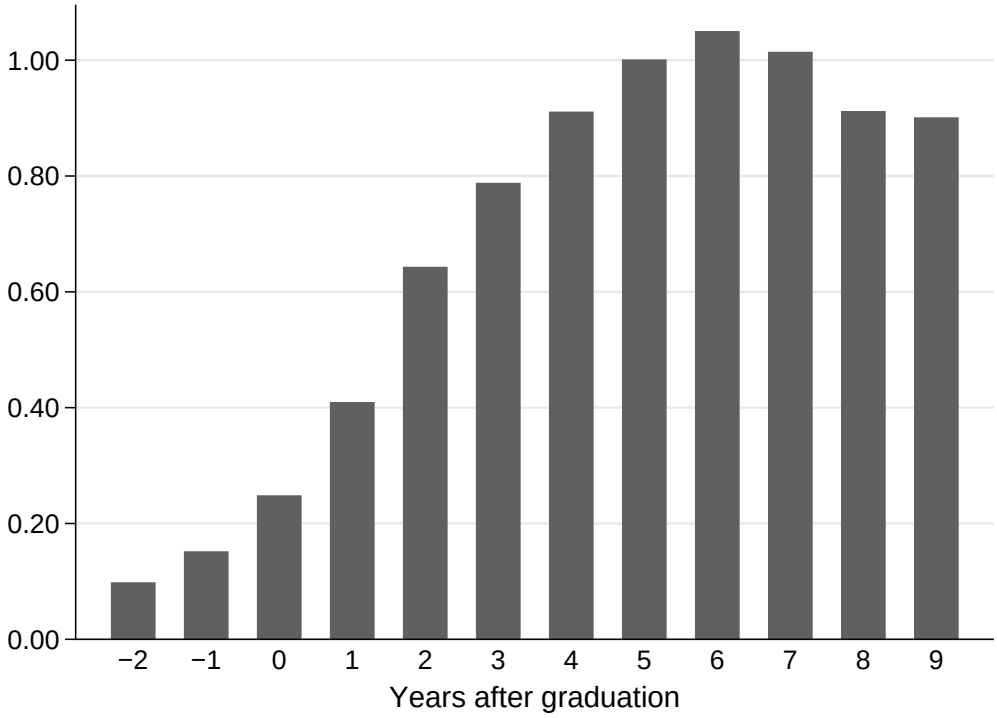
Oster, S. M. and D. S. Hamermesh (1998). Aging and productivity among economists. *The Review of Economics and Statistics 80*(1), 154–156.

Oswald, A. J. (2007). An examination of the reliability of prestigious scholarly journals: Evidence and implications for decision-makers. *Economica 74*(293), 21–31.

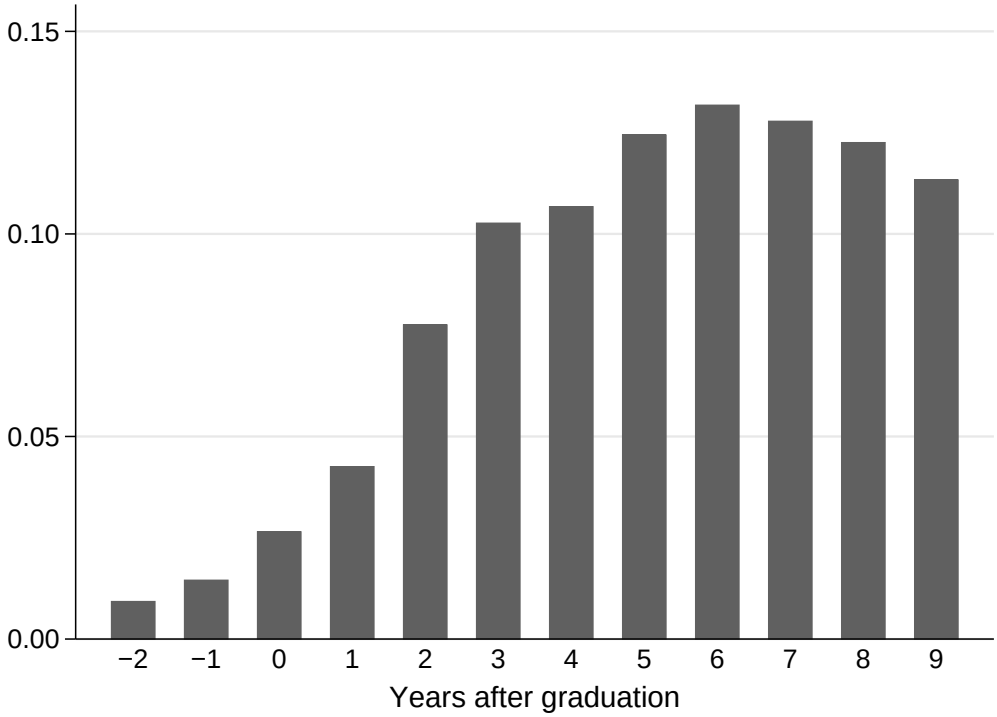
Santos Silva, J. M. C. and S. Tenreyro (2006). The log of gravity. *The Review of Economics and Statistics 88*(4), 641–658.

Sarsons, H. (2017). Recognition for group work: Gender differences in academia. *American Economic Review Papers & Proceedings 107*(5), 141–145.

Zimmermann, C. (2013). Academic rankings with RePEc. *Econometrics 1*(3), 249–280.

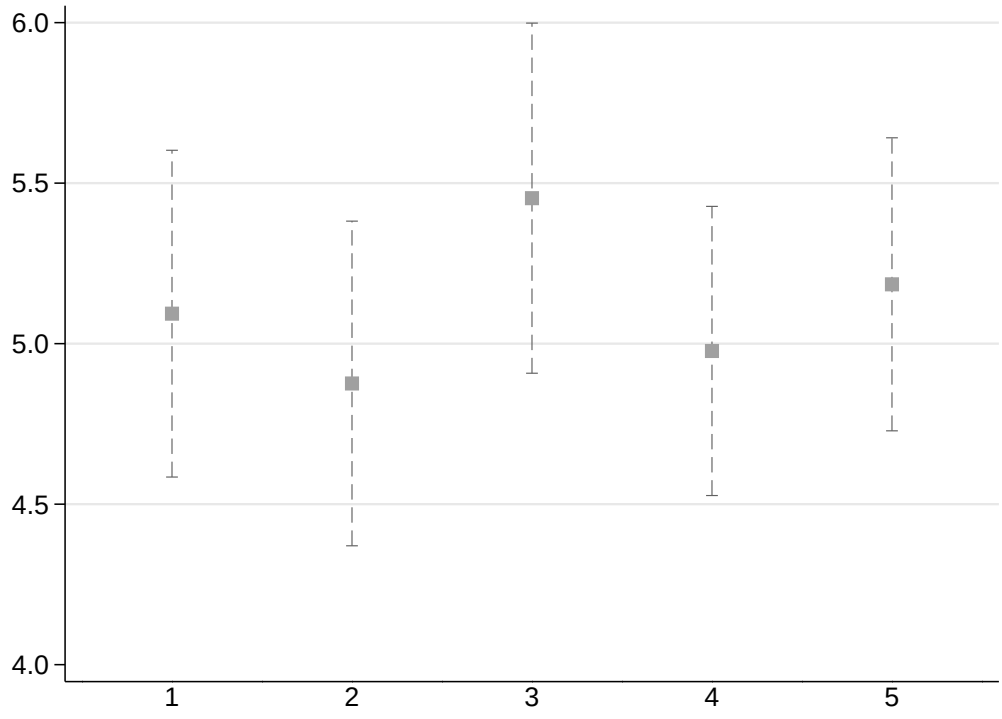


(a) Avg. No. of articles per year

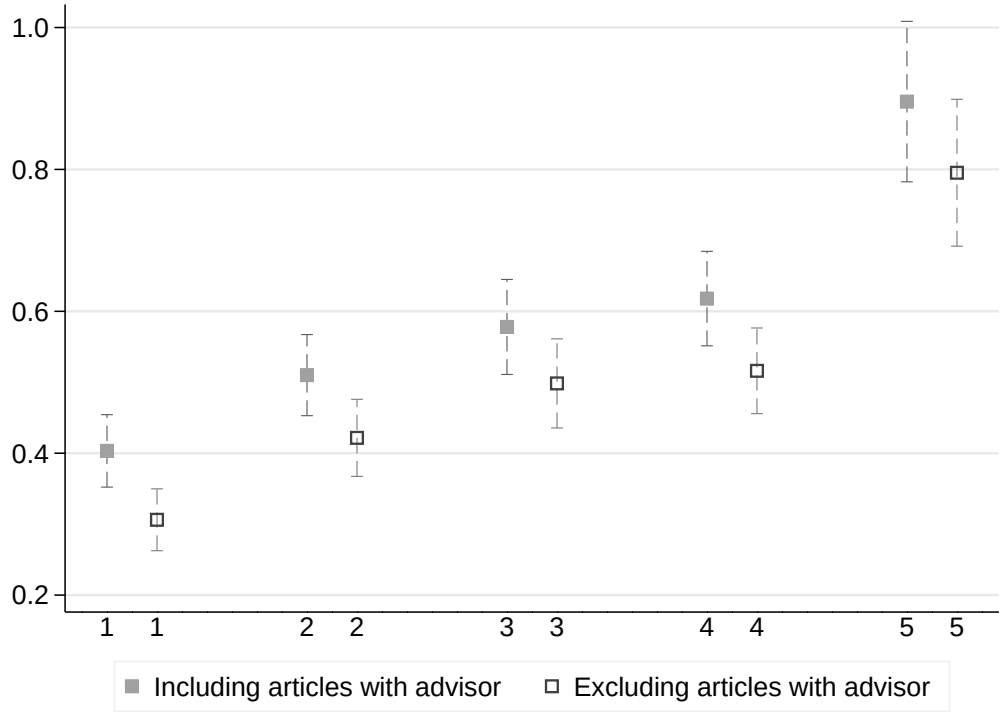


(b) Avg. No. of QJEe articles per year

Figure 1: Yearly academic production of graduates 2002-2007 cohorts

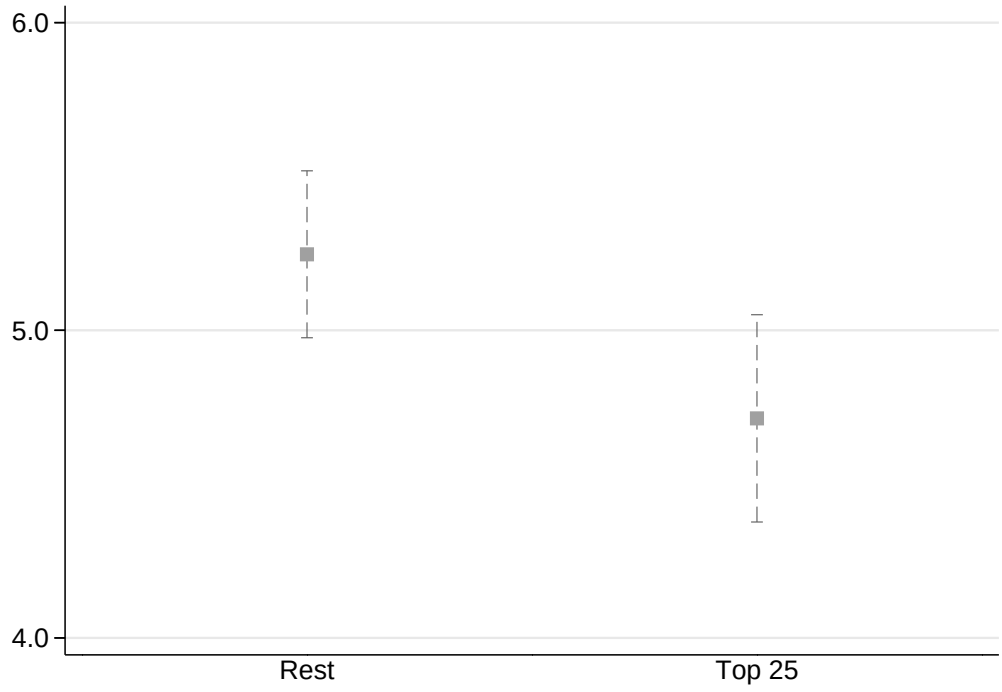


(a) Avg. number of articles

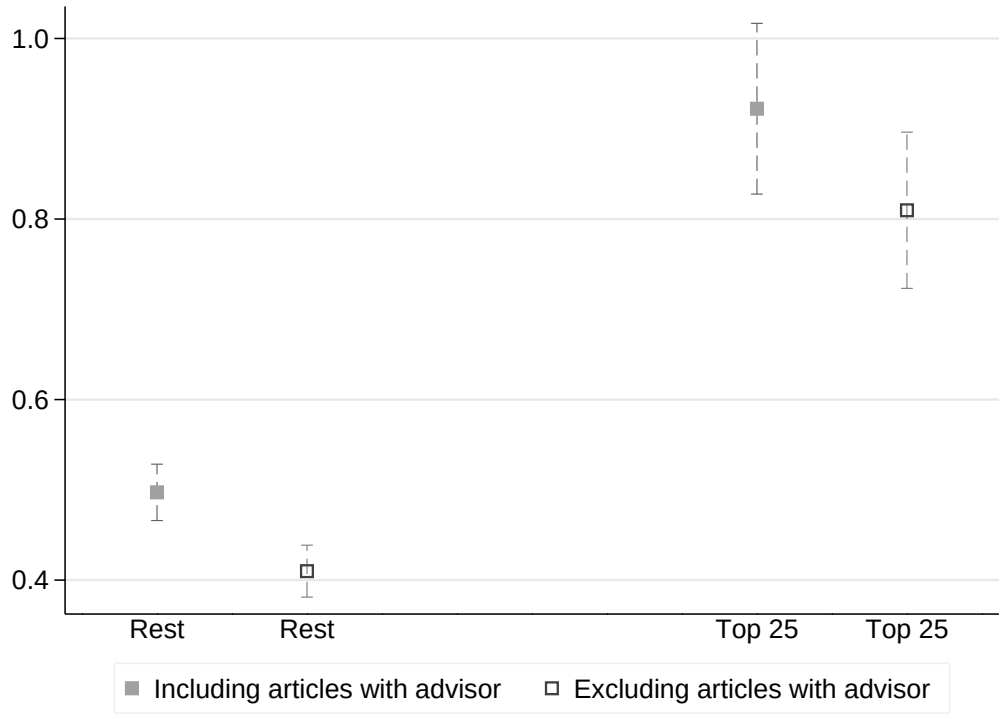


(b) Avg. number of QJEe articles

Figure 2: Articles 6 years after graduation by advisor quality (quintiles)



(a) Avg. number of articles



(b) Avg. number of QJEe articles

Figure 3: Articles 6 years after graduation by institution quality

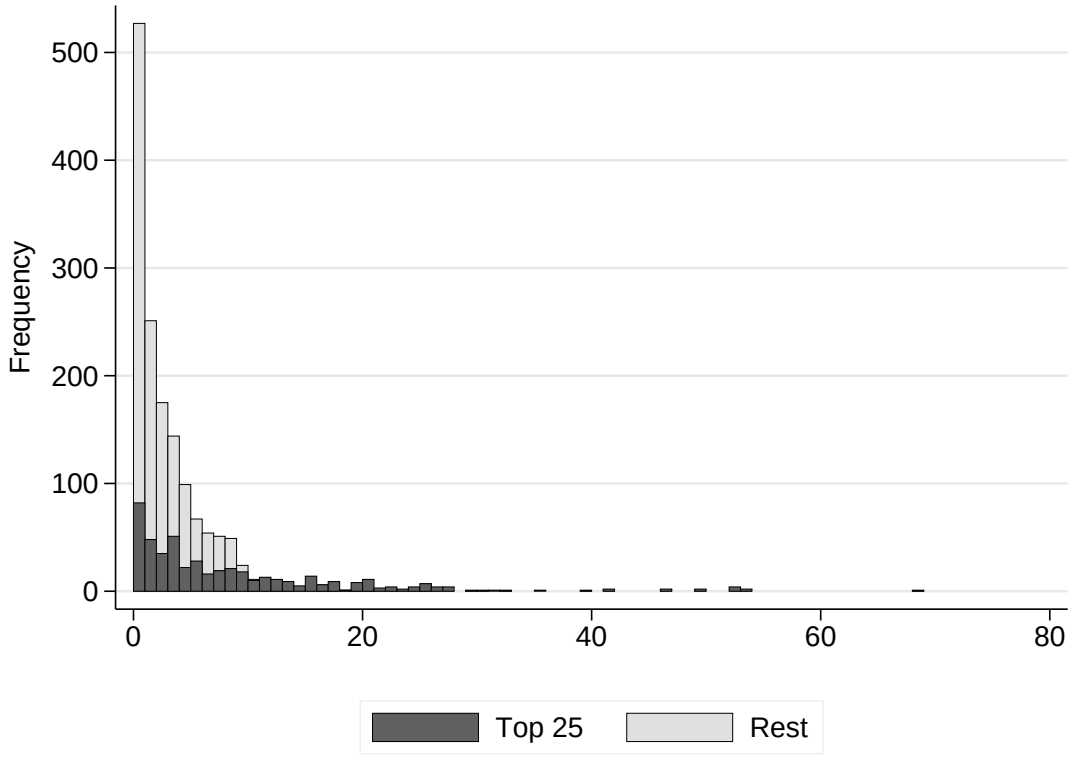


Figure 4: Histogram of *AdvQJEe* by institution ranking

Table 1: Descriptive statistics

	Institution					
	Top 25		Rest		All	
	Mean	SD	Mean	SD	Mean	SD
Articles	4.714	3.773	5.247	5.350	5.117	5.016
ArtQJEe	0.922	1.059	0.497	0.616	0.601	0.770
ArtQJEeNet	0.810	0.969	0.410	0.567	0.507	0.708
AdvQJEe	8.638	10.192	2.968	3.427	4.351	6.333
Coauthorship	0.245	0.430	0.385	0.487	0.351	0.477
AdvTenure	16.751	6.783	15.307	6.721	15.659	6.763
UniRank	0.274	0.304	0.010	0.013	0.074	0.189
Male × *AdvMale*	0.737	0.441	0.694	0.461	0.704	0.456
Male × *AdvFemale*	0.046	0.209	0.046	0.210	0.046	0.210
Female × *AdvMale*	0.201	0.401	0.238	0.426	0.229	0.420
Female × *AdvFemale*	0.017	0.128	0.021	0.145	0.020	0.141
Observations	482	482	1494	1494	1976	1976

Table 2: OLS results for *ArtQJEe*

		Institution			Institution	
	All	Top 25	Rest	All	Top 25	Rest
	(1)	(2)	(3)	(4)	(5)	(6)
AdvQJEe	0.012*	0.001	0.037*	0.003	-0.004	0.029*
	(0.005)	(0.006)	(0.010)	(0.006)	(0.007)	(0.012)
Coauthorship	0.243*	0.555*	0.188*	0.119*	0.386*	0.139*
	(0.037)	(0.129)	(0.033)	(0.038)	(0.125)	(0.045)
AdvQJEe × *Coauth.*				0.032*	0.021*	0.017
				(0.010)	(0.010)	(0.016)
AdvTenure	0.019*	0.021	0.015	0.019*	0.020	0.016†
	(0.009)	(0.026)	(0.009)	(0.009)	(0.026)	(0.009)
$AdvTenure^2$	-0.001*	-0.001	-0.001*	-0.001*	-0.001	-0.001*
	(0.000)	(0.001)	(0.000)	(0.000)	(0.001)	(0.000)
$UniRank \times 10^2$	0.011*	0.010*	0.021	0.012*	0.011*	0.022
	(0.002)	(0.002)	(0.016	(0.002)	(0.002)	(0.016)
Male × *AdvFemale*	-0.103	-0.261†	-0.043	-0.111	-0.264†	-0.047
	(0.071)	(0.150)	(0.080)	(0.071)	(0.151)	(0.080)
Female × *AdvMale*	-0.158*	-0.244*	-0.163*	-0.159*	-0.237*	-0.164*
	(0.032)	(0.090)	(0.030)	(0.032)	(0.090)	(0.030)
Female × *AdvFemale*	-0.123	0.060	-0.143*	-0.124	0.056	-0.146*
	(0.097)	(0.394)	(0.059)	(0.095)	(0.386)	(0.059)
Constant	0.491	0.675	0.445	0.542	0.727	0.466
	(0.104)	(0.312)	(0.078)	(0.104)	(0.310)	(0.080)
Observations	1976	482	1494	1976	482	1494
Field dummies	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.197	0.284	0.128	0.210	0.291	0.130

Standard errors in parentheses. † $p < 0.10$, * $p < 0.05$.

Table 3: OLS results for *ArtQJEeNet*

		Institution			Institution	
	All	Top 25	Rest	All	Top 25	Rest
	(1)	(2)	(3)	(4)	(5)	(6)
AdvQJEe	0.011*	0.002	0.032*	0.005	-0.002	0.029*
	(0.005)	(0.006)	(0.009)	(0.006)	(0.006)	(0.012)
Coauthorship	-0.023	0.097	-0.036	-0.104*	-0.048	-0.055
	(0.032)	(0.109)	(0.030)	(0.033)	(0.114)	(0.040)
AdvQJEe × *Coauth.*				0.021*	0.018†	0.007
				(0.008)	(0.009)	(0.014)
AdvTenure	0.015†	0.013	0.013	0.015†	0.012	0.013
	(0.009)	(0.025)	(0.009)	(0.009)	(0.025)	(0.009)
$AdvTenure^2$	-0.001†	-0.000	-0.001*	-0.001†	-0.000	-0.001*
	(0.000)	(0.001)	(0.000)	(0.000)	(0.001)	(0.000)
$UniRank \times 10^2$	0.009*	0.009*	0.017	0.010*	0.094*	0.017
	(0.002)	(0.002)	(0.015)	(0.019)	(0.021)	(0.016)
Male × *AdvFemale*	-0.096	-0.258†	-0.038	-0.102	-0.261†	-0.040
	(0.068)	(0.142)	(0.076)	(0.068)	(0.143)	(0.076)
Female × *AdvMale*	-0.148*	-0.243*	-0.145*	-0.149*	-0.237*	-0.145*
	(0.029)	(0.086)	(0.028)	(0.029)	(0.086)	(0.028)
Female × *AdvFemale*	-0.102	0.073	-0.127*	-0.102	0.069	-0.128*
	(0.094)	(0.393)	(0.053)	(0.093)	(0.387)	(0.053)
Constant	0.492	0.689	0.443	0.525	0.733	0.451
	(0.100)	(0.306)	(0.073)	(0.100)	(0.304)	(0.074)
Observations	1976	482	1494	1976	482	1494
Field dummies	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.173	0.248	0.092	0.180	0.254	0.093

Standard errors in parentheses. † $p < 0.10$, * $p < 0.05$.

Table 4: PPML estimates for number of QJE equivalent articles

	ArtQJEe			*ArtQJEeNet*		
		Institution			Institution	
	All	Top 25	Rest	All	Top 25	Rest
	(1)	(2)	(3)	(4)	(5)	(6)
AdvQJEe	0.008	0.002	0.058*	0.007	0.002	0.057*
	(0.005)	(0.005)	(0.019)	(0.005)	(0.005)	(0.019)
Coauthorship	0.284*	0.463*	0.377*	-0.181*	-0.024	-0.095
	(0.056)	(0.114)	(0.080)	(0.066)	(0.142)	(0.091)
AdvQJEe × *Coauth.*	0.016*	0.006	-0.004	0.021*	0.012†	0.002
	(0.006)	(0.006)	(0.019)	(0.006)	(0.007)	(0.019)
AdvTenure	0.032*	0.017	0.039*	0.031†	0.008	0.041†
	(0.016)	(0.027)	(0.020)	(0.018)	(0.030)	(0.023)
$AdvTenure^2$	-0.001*	-0.001	-0.002*	-0.001†	-0.000	-0.002*
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
$UniRank \times 10^2$	0.011*	0.009*	0.057*	0.011*	0.008*	0.055†
	(0.013)	(0.001)	(0.028)	(0.001)	(0.001)	(0.032)
Male × *AdvFemale*	-0.172	-0.307	-0.090	-0.188	-0.341	-0.097
	(0.141)	(0.227)	(0.179)	(0.156)	(0.240)	(0.200)
Female × *AdvMale*	-0.290*	-0.214*	-0.371*	-0.324*	-0.268*	-0.388*
	(0.061)	(0.101)	(0.071)	(0.067)	(0.111)	(0.079)
Female × *AdvFemale*	-0.207	0.141	-0.352*	-0.201	0.145	-0.383*
	(0.197)	(0.370)	(0.150)	(0.225)	(0.386)	(0.172)
Constant	-0.598	-0.205	-0.898	-0.619	-0.183	-0.901
	(0.156)	(0.266)	(0.176)	(0.177)	(0.300)	(0.200)
Observations	1976	482	1494	1976	482	1494
Field dummies	Yes	Yes	Yes	Yes	Yes	Yes
pseudo R^2	0.222	0.341	0.136	0.189	0.292	0.093
p-val GNR	0.013	0.148	0.030	0.005	0.270	0.025
λ_1	1.385	1.253	1.438	1.313	1.180	1.474
$se(\lambda_1)$	0.126	0.174	0.130	0.090	0.169	0.103

Standard errors in parentheses. † $p < 0.10$, * $p < 0.05$.

Table 5: PPML estimates for number of articles published in top journals

	Top 25 journals			Top 50 journals		
	All	Top 25	Rest	All	Top 25	Rest
	(1)	(2)	(3)	(4)	(5)	(6)
AdvQJEe	0.012†	0.002	0.130*	0.012*	0.004	0.084*
	(0.007)	(0.006)	(0.026)	(0.005)	(0.005)	(0.022)
Coauthorship	0.197†	0.594*	0.398*	0.159*	0.425*	0.290*
	(0.104)	(0.153)	(0.168)	(0.078)	(0.130)	(0.116)
AdvQJEe × *Coauth.*	0.021*	0.003	-0.026	0.023*	0.009	0.001
	(0.008)	(0.008)	(0.029)	(0.007)	(0.006)	(0.023)
AdvTenure	-0.000	-0.018	0.031	0.016	-0.016	0.040
	(0.027)	(0.033)	(0.042)	(0.022)	(0.030)	(0.032)
$AdvTenure^2$	-0.000	0.001	-0.002	-0.001	0.000	-0.002*
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
$UniRank \times 10^2$	0.016*	0.009*	0.072	0.013*	0.008*	0.102*
	(0.002)	(0.002)	(0.055)	(0.001)	(0.001)	(0.038)
Male × *AdvFemale*	-0.253	-0.319	-0.189	-0.208	-0.285	-0.171
	(0.244)	(0.340)	(0.329)	(0.188)	(0.262)	(0.256)
Female × *AdvMale*	-0.256*	-0.198	-0.403*	-0.183*	-0.200†	-0.220*
	(0.102)	(0.128)	(0.154)	(0.080)	(0.109)	(0.107)
Female × *AdvFemale*	0.126	0.428	-0.170	-0.038	0.214	-0.258
	(0.302)	(0.349)	(0.310)	(0.242)	(0.303)	(0.252)
Constant	-0.584	0.038	-1.376	0.068	0.698	-0.489†
	(0.249)	(0.316)	(0.389)	(0.199)	(0.277)	(0.273)
Observations	1976	482	1494	1976	482	1494
Field dummies	Yes	Yes	Yes	Yes	Yes	Yes
pseudo R^2	0.171	0.269	0.086	0.187	0.305	0.101
p-val GNR	0.090	0.662	0.034	0.148	0.707	0.107
λ_1	1.162	1.077	1.386	1.174	0.937	1.260
$se(\lambda_1)$	0.089	0.180	0.103	0.124	0.159	0.160

Standard errors in parentheses

† $p < 0.10$, * $p < 0.05$

A Appendix: List of top journals

(1) Quarterly Journal of Economics; (2) Journal of Economic Literature; (3) Journal of Political Economy; (4) Econometrica; (5) Journal of Economic Growth; (6) Journal of Financial Economics; (7) Review of Economic Studies; (8) Journal of Economic Perspectives; (9) Journal of Finance; (10) Economic Policy; (11) Review of Financial Studies; (12) American Economic Review; (13) Journal of Monetary Economics; (14) Brookings Papers on Economic Activity; (15) Journal of Labor Economics; (16) Journal of Econometrics; (17) American Economic Journal: Macroeconomics; (18) Journal of the European Economic Association; (19) Economic Journal; (20) Rand Journal of Economics; (21) Review of Economics and Statistics; (22) Journal of Applied Econometrics; (23) World Bank Economic Review; (24) Journal of Human Resources; (25) American Economic Journal: Applied Economics; (26) Journal of International Economics; (27) Journal of Business and Economic Statistics; (28) Journal of Public Economics; (29) Journal of Financial Intermediation; (30) Journal of Environmental Economics and Management; (31) Foundations and Trends(R) in Econometrics; (32) Journal of Economic Surveys; (33) Experimental Economics; (34) Journal of Development Economics; (35) Review of Economic Dynamics; (36) Journal of Economic Theory; (37) Journal of Law and Economics; (38) European Economic Review; (39) International Economic Review; (40) Journal of Accounting and Economics; (41) World Bank Research Observer; (42) Annual Review of Economics; (43) American Economic Journal: Economic Policy; (44) Journal of Risk and Uncertainty; (45) International Journal of Central Banking; (46) Journal of Money, Credit and Banking; (47) Oxford Bulletin of Economics and Statistics; (48) Journal of Law, Economics, and Organization; (49) Journal of International Business Studies; (50) IMF Economic Review.

The list does no include the Journal of Business, which stopped being published in 2006. Similarly, Proceedings, Federal Reserve Bank of San Francisco; Proceedings, Federal Reserve Bank of Cleveland; Western Economic Developments, Federal Reserve Bank of San Francisco; and Quarterly Review, Federal Reserve Bank of Minneapolis, are not included either because they tend to rely on invited papers.

B Appendix: List of top departments

(1) Harvard; (2) MIT; (3) Princeton; (4) UC-Berkeley; (5) Chicago; (6) Oxford; (7) Paris School of Economics; (8) Stanford; (9) NYU; (10) Toulouse School of Economics; (11) Columbia; (12) Yale; (13) Brown; (14) Boston; (15) Barcelona Graduate School of Economics; (16) UC-San Diego; (17) Dartmouth College; (18) Michigan; (19) Pennsylvania; (20) LSE; (21) Northwestern; (22) UCL; (23) Columbia (Finance); (24) British Columbia; (25) Wisconsin-Madison.

C Appendix: Field classification

The capital letter in parentheses is the JEL classification. The three small-case letters in parentheses refer to the nep classification.
(A) General Economics, Teaching: (soc) Social Norms and Social Capital, (sog) Sociology of Economics.
(B) History of Economic Thought, Methodology, Heterodox Approaches: (hme) Heterodox Microeconomics, (hpe) History and Philosophy of Economics, (pke) Post Keynesian Economics, (pol) Positive Political Economics.

(C) Mathematical, Quantitative Methods: (big) Big Data, (cmp) Computational Economics, (dcm) Discrete Choice Models, (ecm) Econometrics, (evo) Evolutionary Economics, (exp) Experimental Economics, (for) Forecasting, (gth) Game Theory, (ore) Operations Research.
(D) Microeconomics: (cbe) Cognitive and Behavioural Economics, (cdm) Collective Decision-Making, (cta) Contract Theory and Applications, (des) Economic Design, (ets) Econometric Time Series, (ipr) Intellectual Property Rights, (knm) Knowledge Management and Knowledge Economy, (mic) Microeconomics, (net) Network Economics, (neu) Neuroeconomics, (upt) Utility Models and Prospect Theory.
(E) Macroeconomics, Monetary Economics: (ban) Banking, (cba) Central Banking, (dge) Dynamic General Equilibrium, (eff) Efficiency and Productivity, (gro) Economic Growth, (mac) Macroeconomics, (mon) Monetary Economics, (opm) Open Economy Macroeconomics, (pay) Payment Systems and Financial Technology.
(F) International Economics: (ifn) International Finance, (int) International Trade.
(G) Financial Economics: (cfn) Corporate Finance, (fdg) Financial Development and Growth, (fin) Finance, (fle) Financial Literacy and Education, (fmk) Financial Markets, (ias) Insurance Economics, (mfd) Microfinance, (mst) Market Microstructure, (ppm) Project, Program and Portfolio Management, (rmg) Risk Management.
(H) Public Economics: (pbe) Public Economics, (pub) Public Finance.
(I) Health, Education, Welfare: (edu) Education, (hea) Health Economics.
(J) Labor, Demographic Economics: (age) Economics of Ageing, (dem) Demographic Economics, (gen) Gender, (hap) Economics of Happiness, (hrm) Human Capital and Human Resource Management, (lab) Labour Economics, (lma) Labor Markets - Supply, Demand, and Wages, (ltv) Unemployment, Inequality and Poverty, (mig) Economics of Human Migration.
(K) Law and Economics: (law) Law and Economics.
(L) Industrial Organization: (com) Industrial Competition, (ent) Entrepreneurship, (ind) Industrial Organization, (nps) Nonprofit & Public Sector, (reg) Regulation, (tid) Technology and Industrial Dynamics.
(M) Business Administration & Business Economics, Marketing, Accounting, Personnel Economics: (acc) Accounting and Auditing, (bec) Business Economics, (cse) Economics of Strategic Management, (his) Business, Economic and Financial History, (mkt) Marketing, (sbm) Small Business Management,
(O) Economic Development, Innovation, Technological Change, Growth: (afr) Africa, (ara) Middle East & North Africa, (cna) China, (cis) Confederation of Independent States, (cwa) Central & Western Asia, (dev) Development, (eec) European Economics, (eur) Microeconomic European Issues, (ino) Innovation, (iue) Informal and Underground Economics, (lam) Central & South America, (sea) South East Asia, (tra) Transition Economics.
(Q) Agricultural and Natural Resource Economics, Environmental & Ecological Economics: (agr) Agricultural Economics, (ene) Energy Economics, (env) Environmental Economics, (res) Resource Economics.
(R) Urban, Rural, Regional, Real Estate, Transportation Economics: (geo) Economic Geography, (tre) Transport Economics, (ure) Urban and Real Estate Economics.
(Z) Other Special Topics: (cul) Cultural Economics, (ger) German Papers, (ict) Information and Communication Technologies, (spo) Sports and Economics, (tur) Tourism Economics.