Fame and the Fortune of Academic Economists:
How the market rewards influential research in economics*

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Abstract

We analyze the pay and position of 1,009 faculty members who teach in doctoral-granting economics departments at fifty-three large public universities in the United States. Using the Web of Science, we have identified the journal articles published by these scholars and the number of times each of these articles has been subsequently cited in published research articles. We find that research influence, as measured using publication counts or the Hirsch index, is a surprisingly strong predictor of the salary and the prestige of the department in which they are employed. The Hirsch index alone explains more than 50 percent of the variation in log salaries across individuals in a bivariate regression. We also examine the degree to which coauthorship is discounted by the market. For salaries, the evidence is quite clear that the market values citations to articles with multiple coauthors the same as citations to single-authored articles. On the other hand, the rank of the department at which one is employed is best explained by per capita citations.

I. Introduction

A primary responsibility of professors at research universities is to produce new and useful knowledge. In a world where universities compete for the best researchers, we expect that those whose work is most important or influential will be able to command the highest salaries and that they will find employment at the best universities, where their skills will be most valued.

Labor economists who study the academic labor market have long been interested in the question of how to best measure the influence of an individual's research. Most early attempts to identify the effect of research quality measured this simply by counting the number of publications, perhaps distinguishing by type, such as in Tuckman and Leahy (1975) or Tuckman, Gapinski and Hagemann (1977). Later refinements examined whether publications in more prestigious journals counted more in the academic labor market, as in Siegfried and White(1973) or Katz (1973).

The advent of citations databases, especially the Social Sciences Citation Index (SSCI) and the Science Citation Index (SCI), has made it possible to use citation counts as a way to measure the influence of an article or its author. Perhaps the first of these was Holtmann and Bayer (1970) who studied young PhDs in the natural sciences, using a count of citations in the Science Citation Index as one of several determinants of salary. An influential early paper that studied the pay of economists was Hamermesh, Johnson and Weisbrod (1982). Others who have used citation counts to explain academic salaries are Bratsberg, Ragan and Warren (2010), Sauer (1988), Moore, Newman and Turnbull (2001), Diamond (1986). All of these articles find that citations substantially influence salaries.

Two recent articles have much in common with our work here. Hamermesh and Pfann (2011) (HP) use total citation counts from the SSCI to explain a variety of outcomes for a sample of full professors at 88 US economics departments. These outcomes include whether a professor was elected a Fellow of the Econometric Society, the prestige of the department at which the professor works, as well as the professor's salary. Hamermesh and Pfann pose the question in terms of quantity and quality of publications—with quantity measured by the number of articles published, and quality being measured by the number of citations to those articles. Generally, they find that citations are an important determinant of "reputation" while numbers of publications are not. However, salary is apparently determined by both the quantity and quality of publications. Ellison (2010) uses citations from Google Scholar. He analyzes a sample of "young tenured economists" at the top 25 US economics departments, and explains the rank of an individual's department using that individual's Hirsch index as an explanatory variable. (We discuss the Hirsch index in detail below.) He finds that the Hirsch index (or some generalization of it) provides a better fit to the data than traditional citation counts.

In this paper, we undertake analyses similar to those described in HP and Ellison. That is, we explore how an individual's citations history affects that individual's pay and position. Our approach differs most markedly in that we analyze all faculty members, not just full professors or tenured professors. We also have a somewhat larger and more consistent sample than H&P. Our sample also better represents the spectrum of quality of economics departments in the US, ranging from rank 104 to rank 7 according to the 1995 National Research Council rankings.

II. On Measuring "Influence"

Are citations the right way to measure the influence of someone's research? Posner (2000) describes a variety of reasons why an author would cite someone else's work. He asserts that the majority of citation in science and social science is to recognize the "priority" of the cited author's method, discovery, argument or way of describing something. Citations of this sort are exactly what we mean by influence in social science. In some cases, this influence may actually be negative. We might write an article to refute the article that we are citing, for example. Still, we have been influenced to think about the idea. Such controversy has an important role in science.

On the other hand, citations may be motivated for strategic reasons that have nothing to do with the influence of the article that is cited. An author might want to flatter a potential referee or editor, for example. Cole (2000) discusses some other aspects of the controversy with using citations to measure impact.

Despite potential limitations, the use of citations to measure the importance or influence of an article is now widely accepted. Furthermore, it has been shown to be a powerful source for explaining things like salaries.

III. Data

A. Salary and Biographical Data

Because individual salary information is rather difficult to come by, previous studies of salary determination in the profession have relied on fairly limited samples. Among recent examples, Bratsberg, Ragan, and Warren (2003) analyze panel data on 176 tenure-track faculty at five identified Midwestern universities while Moore, Turnbull, and Newman (1998) analyze cross-sectional data on 142 tenure-track faculty at nine unidentified state universities. According to the authors themselves, the universities in both of those studies could be considered mid-level and thus as noted in Moore, Turnbull, and Newman “one should not infer that our empirical results generalize to the Top 20 programs.” This is unfortunate, as salary determination within the profession can, and perhaps even likely, does differ across the program quality distribution and by repeated moving/staying decisions.

Beyond the legwork involved, there is little to prevent a researcher from compiling a much more sizable and detailed faculty salary data set that enables comparisons across the program quality distribution while providing more extensive individual-level information. The 1966 Freedom of Information Act (FOIA) gave citizens the power to request a substantial amount of information from federal government files. While the law did not apply to state governments, most states have since enacted their own FOIA policies that enable citizens to request state government records. As such, it should be possible to compile faculty salary data on the vast majority of public universities in the U.S. Because our focus is Ph.D.-granting programs, in August 2007 we began requesting salary data for faculty members at the 68 public programs listed among the 1995 NRC Rankings of the top 106 U.S. Ph.D.-granting economics programs. In response, we received reliable current salary information from the 53 programs listed in table 1. As indicated there, our current sample reflects a much more complete cross-section of the profession than those analyzed in previous studies and the current sample of 1,009 individuals (excluding those with administration appointments) for whom we can collect sufficient individual background characteristics is a vast improvement on the samples previously studied.[1]

To these data we added biographical details that we collected from on-line CVs and biographies, including their academic rank, the date of hire at their current institution, the year in which they earned the Ph. D., and their sex.

B. Publications and Citations Data

We collected all the information on publications and their citations through the end of 2006 from the Web of Science, an online database that is owned by Thompson Reuters. We identified all the listed publications in the Web of Science for each of the individuals in our salary sample, using the search tools available. This is a labor-intensive undertaking, as we must separate the publications of individuals who have similar names. For most entries in WOS, the name is listed by last name and initials of given names. For individuals like Daniel Hamermesh, there is no confusion. On the other hand, we had to distinguish between well known economists James C. Cox (who is in our sample) and

[1] Our sample is quite comparable to that used by Hamermesh and Pfann (2011). For their salary analysis, they collected data from 43 public institutions, mostly for the 2007-2008 academic year. However, for some of the schools in their sample, they used data from other years, inflating or deflating by a factor of 1.04 for each year. Furthermore, they collect information only for full professors. In the end, they have a sample of 564 professors with salary data. Our sample contains 570 full professors.

John C. Cox (who is not). We did this by comparing CVs with the list of articles in our WOS search result, and restricting search on the basis of known affiliations during the professor's career. We also examined our resulting list of publications on the basis of field, journal titles, and article titles. There is the potential for errors of both inclusion and exclusion.

The Web of Science consists of three datasets --Science Citation Index-Expanded, Social Science Citations Index, and Arts and Humanities Citation Index. These datasets contain articles published in a large but select set of journals. Many journals indexed in EconLit, for example, are not indexed in SSCI.[2] However, all of the established economics journals are included, and it is unlikely that we have understated the influence of an individual's contributions by much.

Books or chapters in books are not included. However, we have included all types of entries in WOS. While we refer to them as articles, in some cases these are items such as editorials, editorial introductions to special issues, book reviews, or conference proceedings. We collected information from all three of the datasets. Although the bulk of articles by economists in our sample is in journals indexed by SSCI, some important work by economists appears in the sciences or engineering journals. For example, the second most cited article in our sample is a paper by Hal White that appears in *Neural Networks*, a journal that is indexed in SCI but not in SSCI. (The article had more than 2,500 citations through 2006.)

Tables 2 and 3 provide summary information about the underlying articles that are used in our sample. These tables examine only unique articles—articles may be used multiple times to compute individual cumulative citations in our sample if more than one of the coauthors of the paper is in our

[2] See Garfield (1990) for a discussion of how journals are selected for inclusion in the Web of Science databases. Klein and Chiang (2004) argue that there is an ideological bias in the selection of journals to the SSCI.

sample. Publication years range from 1956 to 2006, but the vast majority of the articles were published after 1980. There are on average 1.8 authors per article, with maximum number of 16.[3]

The average number of citations for these articles is 12.84, but total citations are extremely skewed in distribution, as shown in Table 3. The median article had only 3 citations. More than 30 percent of articles are not cited at all. In part this can be explained by the fact that some of the entries are short book reviews and introductions to special issues or the like, and the author would not have expected them to be cited. On the other hand, a book review could be quite influential, so we have not excluded these ex ante. Another reason that some are not cited is because they are too recently published. Sadly, this does not make a huge difference. For articles at least six years old, more than 25 percent have not been cited. A simple linear regression with intercept yields a slope estimate of about 0.5. The median article is cited about once every four years. Relatively speaking, an article that has been cited 10 times is very successful, and one that has been cited more than 50 times is outstanding. (Roughly, the single most cited article has more total citations than the least cited 9,000 articles.)

The standard citations database is the Web of Science, parts of which have existed since the 1960s. However, alternatives have started to appear. One is Google Scholar, an online service created by the web search giant. It uses robot search programs to identify scholarly work that is available on the web and to collect citations data from it. The advantage of Google Scholar is that it defines influence more broadly—its sources include working papers and books, as well as published articles in journals. Potentially, it indexes more journals than Web of Science, as well. The disadvantage is that it is hard to know exactly what its universe is. Exactly which articles are indexed? How does it treat multiple versions of a working paper, some of which will undoubtedly have different titles? Should citations by papers that will never be published be counted equally with those that are published after peer review?

[3] While a few entries in the WOS for our professors had more than 16 authors, we determined that these were all entries such as conference reports that listed all attendees, or letters to the editor with all signatories listed as authors. We therefore eliminated these entries from our sample.

A casual comparison of several articles suggests that Google Scholar provide 2 to 10 times more citations.

SCOPUS is another online research service operated by the publisher Elsevier that may have citations capability. RePec (Research Papers in Economics) is set of online databases and programs that is mostly volunteer effort. As it uses authors to identify their own paper, it has the potential to be very accurate. It focuses on economics articles, only. At this time, its coverage is not complete enough to do the sort of analysis presented here.

C. Aggregate Citations and the Hirsch Index

The typical way to aggregate citation counts to articles is to simply sum the citation counts of all the articles that an individual has written. However, because this aggregate citation count is highly skewed, and because a single article typically contributes a large part the total, it is sensible to summarize an individual's citation record in a way that somehow reduces the impacts of articles in the upper tail. We have adopted two approaches. The first is the logarithm of the aggregate citations plus one. (Adding one is necessary because a significant number of those in our sample have no citations.) The second method we use is to compute the Hirsch index (or h-index) for each individual.

The h-index has been suggested as a "particularly simple and useful way to characterize the scientific output of a researcher." (Hirsch, 2005) Consider a researcher who has N publications. If h of those publications have been cited at least h times, while the other N-h publications have been cited less than h times, then he or she has an index value of h. An intuitive way to think of this index is that it is a count of the number of "important" papers, where the level of importance increases with the number of papers. Thus someone with an h value of 5 has 5 papers of relatively little impact, while someone with an h of 30 has 30 papers of very high impact. (Recall that a paper with 30 citations is at the 90th percentile of the papers in our sample.) Ellison (2010) has suggested a generalization of Hirsch's index, the h(a,b) index, where h(a,b) is defined as the researcher as at least h papers with ah^b citations. He suggest h(5,2) as particularly useful, although he analyzes senior researchers at only the top programs (highly cited and many papers), using Google Scholar citation counts (which are much higher than WOS counts). We find that the h(5,2) index does a poorer job than the h index of describing scholarly influence of researchers across the entire spectrum of economics graduate programs.

D. Coauthorship

A frequent question that arises in this literature is how to treat coauthored papers. Two obvious solutions are (1) to ignore coauthors completely, giving each coauthor full credit for each paper or citation, or (2) to divide the number of citations (or the number of articles) by the number of coauthors. (Citations needed.) An intermediate approach, suggested by Ellison (2010) and [Need reference] is to weight each citation or publication by $1/N^c$, where c is some number between 0 and 1, 0 and 1 representing the extremes just mentioned. Potentially, c is a parameter that could be estimated. We explore this in some of our specifications below. For the h index, Ellison adopts a fractional counting method suggested by Egghe (2008). We, too, adopt this suggestion in some of our analyses.

E. Summary Statistics

Table 4 presents summary statistics for the data we use in our analysis. Salaries range from $60,000 to $342,000, with a mean of about $122,000. The average professor in our sample has about 20 years of experience and about 16 years of seniority at his or her current institution. He or she has written on average about 21 paper that have 275 cumulative citations. This falls to 172 in terms of citations per author reflecting the fact that coauthorship is common in our sample. The Hirsch index (h) varies from 0 to 31, with a mean of 6. The average professor in our sample has published 21 articles, with 2.63 in the best journals, 7.05 in the second tier, and 11.4 in lesser journals (or in our case, in journals outside of the economics field).[4]

Table 5 presents more detail about the distributions of our citations variables. The median professor has an h-index of 5. This falls to 4 when adjusted for coauthorship. An h value of 10 puts an author in the upper quartile. A value of 20 places him or her among the elite.

The h(5,2) index suggested by Hirsch varies little in our sample—55 percent have a value of 0 or 1, so it will be difficult to explain variations in salaries in this sample using that variant of the Hirsh index.

As expected, the cumulative citations distribution is highly skewed, with a mean of 275 and a median of 76. A professor with 300 citations is near the 75th percentile. Someone with 1000 cumulative citations is close to the 95th percentile. The highest ranked professor has over 10,000 cumulative citations through 2006.

IV. Results—Salaries

Table 6 summarizes results of our regression analyses of faculty salaries. A surprising result is that the h index (and its square) alone explain more than 52 percent of the variation in log salary in our sample, as shown in column 1. The h index increases with the length of career, both because the number of articles cited may increase, and also because existing articles acquire more citations, too. The marginal effect of h decreases as h increases, becoming negative for h values greater than 22 to 32, depending on the specification.

Column 2 adds basic demographic variables to the model. These explain a small fraction of the residual unexplained variance, but they statistically important. Salaries grow modestly with experience, even after controlling for citations. Individuals who have not changed employers during their careers

[4] We adopt the journal tiers of Scott and Mitias (1996). The elite journals are *American Economic Review*, *Econometrica, Journal of Political Economy, Quarterly Journal of Economics*, and *Review of Economics and Statistics*. Another 31 economics journals comprise the "excellent" group here.

have much lower salaries than those who have moved. This result was first emphasized in Ransom (1993) and has been studied (and reconfirmed) in numerous subsequent articles, including Bratsberg, Ragan and Warren (2010), Bratsberg, Ragan and Warren (2003), Monks and Robinson (2001), Barbezat and Donihue (1998), and Moore, Newman and Turnbull (1998). There is no statistically significant difference in pay between men and women in our sample after controlling for the value of h.

Column 3 includes measures of publication activity. Even after measuring the impact of publications, the number of publications has some impact on salaries, at least when the articles are published in the best journals. Ten "elite" publications would add about 12 percent to an individual's salary, on top of the rewards for the citations to those articles.

Columns 4 through 6 repeat the analysis of the first three columns, but uses log(cumulative citations + 1) as the explanatory variable. The results are qualitatively similar. However, the h index fits the data better.

We repeat using citation measures that have been adjusted for coauthorship. An author receives 1/N citations for each citation to a paper with N authors. For computing the h index, this corresponds to Egghe's (2008) "fractional citation counts" method. Again, the results are qualitatively similar.

For both the h index (columns 1-3) and the log citations (columns 4-6) approaches, the unadjusted citations variables have more explanatory power. Is this difference in fit statistically significant? One way to approach this question is to consider a more general model, where each citation is adjusted by $1/N^c$. That is, the citation to a paper with two authors would be counted as $1/2^c$, where c is some number between 0 and 1. If c=0, our results are those in Table 6. If c=1, our results are those in Table 7. We could imagine estimating c from our data. This turns out to be a very cumbersome enterprise, especially for the h-index. However, imagine that we did such estimation using a maximum likelihood approach. We could then test whether coauthored papers were fully discounted using a likelihood ratio test, by comparing the values of the log likelihood from the results in Table 7 with the maximized log likelihood value. A conservative version of this test, then, is to compare the log likelihood values that we get from our estimates in Table 6, which will be less than or equal to the log likelihood for the maximizing value of c. Table 8a presents the result of this comparison for the h index. Compared to a chi-squared with one degree of freedom, this "test statistic" is very large, which would lead us to reject to hypothesis of full discounting of citations to coauthored articles.

The same exercise for the log citations variable is presented in Table 8b, with a wider variety of values for c. In this case, it is clear that the value of the likelihood function is decreasing as c increases, and that the best estimate is a value of 0, as in the previous case. The differences in the log likelihood function are statistically large. Our salary data are best described by the hypothesis that coauthored papers receive the same weight as single-authored papers. We can certainly reject the hypothesis of full discounting.

V. Results—Departmental Rank

The prestige of an economics department depends to a large extent (perhaps only) on the reputation of its faculty members. This is apparent in Figure 1, which is a box/whisker plot showing the distribution of log(cumulative citations+1) for faculty in each department in our sample, arrayed according to the 1995 National Research Council rankings of the departments. (This plot shows only faculty members whose PhD degree was earned before 1999, as most young faculty members have not had a chance to accumulate many citations.) The distributions shown in this figure presumably reflect the standards that each of these departments has with respect to hiring and granting tenure.

One way that publishing important articles can influence a professor's career is by creating opportunities for him or her to work at a more prestigious school. We explore this question by examining the rank of hiring department for all those in our sample who were hired during the period

1993-2006. We restrict our analysis to those hired after 1993 because we want to avoid any influence the professor's own publication record may have had on the 1995 rankings. The results of this analysis are found in Tables 9 and 10—Table 9 reports the results for citation variables that have not been adjusted for coauthorship, while Table 10 reports results for citation variables that have been fully adjusted for coauthorship. The results are not surprising. High h indexes are associated with appointments at more prestigious (lower rank) departments. The marginal effect of a higher h index is decreasing, however, as we saw in the salary regressions. We have included PhD to allow time for mobility—it may take time for a productive researcher to move to a better department. However, the net effect we observe is that newer PhDs are appointed to better departments, holding constant the h index or log total citations. There is essentially no sex difference in placement after controlling for other factors. Elite publications help, lesser publications either do not matter (in the case of "excellent articles," or they hurt (in the case of "other" articles.)

Our analysis of coauthorship in the case of department rank is quite different than what we found for salaries. Using the same arguments that we used there, it is clear that per capita citations provide a much better fit for the model, and we can clearly reject statistically coauthored are treated the same as single-authored papers.

VI. Conclusions

Influential publications are highly rewarded in academic economics. Both in terms of where an individual works and how much salary he or she earns, the influence of the individual's publications (as measured by citations) is a dominant factor. In fact, the Hirsch index alone explains more than 50 percent of the variation in log salaries for our sample. In terms of salary, publication counts help, even after counting citations, but it is mostly only articles in the elite journals that have much impact on pay. Surprisingly, it appears that sharing fame is costless—a model in which an author gets full credit for citations to coauthored publications fits the data much better than per capita citation counts. We find significant rewards, in terms of salary, for moving between employers during one's career.

The rank of the department at which established researchers are appointed is also strongly related to an individual's citations history. Once we control for citations, additional publications actually hurt, except for those in the elite journals. In contrast to the case of salaries, for explaining the rank of an individual's departmental, per capita citations are provide a much better fit. Apparently, department chairmen and deans only know how to count. Hiring committees also know how to divide!

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Table 1
Economics PhD Programs in our Sample

Tier	1995 NRC Rank	Program	1995 NRC Rank	Program
2	7 11	UC Berkeley UCLA	13 15	Michigan Wisconsin
3	16 20 24 25	UCSD Maryland Virginia UNC Chapel Hill	26 27 28 30	UW Seattle Michigan State Illinois Iowa
4	31 33 35 36 37 38 41	UT Austin Texas A&M Ohio State Iowa State Arizona UC Davis Florida	42 44 49 50 51 57 58	NC State Indiana UC Santa Barbara Purdue Massachusetts Houston SUNY Buffalo
5	62 63 64 65 66 67 69 71 73 74 75 76 77 78	Florida State Georgia Kentucky South Carolina SUNY Binghamton Arizona State Georgia State UC Riverside Kansas Auburn Clemson Wyoming Southern Illinois SUNY Albany	83 84 86 87 90 92 93 97 98 100 101 103 104	Washington State Connecticut Oklahoma State Nebraska Utah West Virginia Missouri Cincinnati UT Dallas Colorado State New Hampshire Colorado School of Mines Utah State

Table 2

Summary Statistics for Unique Articles
(N=19,937)

	Mean	Standard Deviation	Minimum	Maximum
Total Number of Citations	12.84	53.184	0	4256
Average Number of Citations per Year	0.89	2.640	0	157.63
Publication Year	1991.75	9.846	1956	2006
Number of Authors	1.80	0.975	1	16
Decade of Publication				
1950s	0.002	0.041	0	1
1960s	0.017	0.128	0	1
1970s	0.107	0.309	0	1
1980s	0.260	0.439	0	1
1990s	0.347	0.476	0	1
2000s	0.267	0.443	0	1

Table 3

Summary Statistics for Unique Articles:
Distribution by Citation Frequency

	Total Citations		Citations per Year	
	Date of Publication		Date of Publication	
Percentiles	All Years	Pre-2000	All Years	Pre-2000
25%	0	0	0.00	0.00
50%	3	4	0.25	0.25
75%	11	14	0.90	0.88
90%	30	38	2.19	2.29
95%	52	65	3.56	3.85
99%	137	170	9.17	10.00
Maximum	4256	4256	157.63	157.63
Fraction without Citations	0.301	0.258	0.301	0.258
Number of Articles	19,937	14,629	19,937	14,629

Table 4
Summary Statistics for Analysis Variables
(N=1,009)

Variable	Mean	Std. Dev.	Min	Max
Salary	121,674.90	46,132.03	60,000.00	342,141.90
Log(Salary)	11.64919	0.3339894	11.0021	12.74
Years Experience	19.95	12.17	0	58.00
Years Seniority	15.64	11.54	0	50.00
Year PhD granted	1986.91	12.08	1950	2007
Total Number of Articles	21.04	24.10	0	234
Number of Articles in Elite Journals	2.63	3.93	0	33
Number of Articles in Excellent Journals	7.05	8.75	0	99
Number of Other Articles	11.37	16.70	0	208
Cumulative Citations	274.99	581.86	0	10,943.00
Cumulative Citations Per Author	171.68	389.07	0	7,958.92
Log(Cum Citations+1)	4.00	2.23	0	9.30
Log(Cum Citations per Author +1)	3.59	2.11	0	8.98
h (Hirsch index)	6.03	5.34	0	31.00
H_p (per author adjusted)	4.73	4.29	0	25.00
Citations to most cited paper	70.34	189.25	0	4,256.00
Citations to 2nd most cited paper	38.50	108.33	0	2,785.00
Sum citations to 4 most cited papers	153.21	363.68	0	8,372.00
Citations per author (most cited)	47.57	162.87	0	4,256.00
Citations per author (2nd most cited)	23.57	50.90	0	991.00
Sum citations per author (4 most cited)	99.51	261.21	0	6,388.33

Table 5
Quantiles of Hirsch Related Indexes and Cumulative Citations

Percentile	h	h(5,2)	h (per author)	Cumulative Citations	Cumulative Citations/Author
10%	0	0	0	0	0
25%	2	1	1	12	6.83
50%	5	1	4	76	50.67
75%	9	2	7	302	184.50
90%	14	3	11	749	457.92
95%	17	3	14	1179	730.50
99%	24	4	19	2321	1391
Mean	6.03	1.43	4.73	274.99	171.68
Std. Deviation	5.34	1.12	4.29	581.86	389.07
Maximum	31	6	25	10943	7958.92

Table 6
Regression Results—Salaries (without co-authorship adjustment)
(N=1,009)

	Model					
Variable	(1)	(2)	(3)	(4)	(5)	(6)
h	0.0628*** (0.00322)	0.0739*** (0.00489)	0.0650*** (0.00547)			
h^2	-0.000978*** (0.000176)	-0.00146*** (0.000220)	-0.00147*** (0.000234)			
Log (Cum Cites+1)				-0.0204* (0.00980)	0.00785 (0.0124)	0.0168 (0.0127)
Log(Cum Cites+1)^2				0.0173*** (0.00150)	0.0142*** (0.00159)	0.0101*** (0.00195)
Experience		0.00869* (0.00390)	0.0107** (0.00404)		0.0111** (0.00414)	0.0123** (0.00440)
Experience^2		-0.0000899 (0.0000814)	-0.000159 (0.0000870)		-0.000125 (0.0000853)	-0.000195* (0.0000929)
Seniority		-0.0238*** (0.00350)	-0.0222*** (0.00355)		-0.0243*** (0.00336)	-0.0229*** (0.00351)
Seniority^2		0.000392*** (0.0000833)	0.000364*** (0.0000863)		0.000388*** (0.0000808)	0.000381*** (0.0000853)
Male		0.0151 (0.0184)	0.0100 (0.0179)		0.0139 (0.0181)	0.00966 (0.0180)
# Elite Articles			0.0116** (0.00366)			0.00993** (0.00355)
# Excellent Articles			0.00169 (0.00152)			0.00255 (0.00160)
# Other Articles			0.000725 (0.000659)			0.00123 (0.000662)
Constant	11.33*** (0.0104)	11.38*** (0.0190)	11.38*** (0.0194)	11.37*** (0.0120)	11.39*** (0.0189)	11.38*** (0.0196)
R^2	0.524	0.568	0.577	0.517	0.561	0.572

Dependent variable is ln(Salary). Standard errors in parentheses. P-values* p<0.05, ** p<0.01*** p<0.001

Table 7
Regression Results—Salaries (with co-authorship adjustment)
(N=1,009)

	Model					
Variable	(1)	(2)	(3)	(4)	(5)	(6)
h (per author)	0.0776*** (0.00441)	0.0856*** (0.00587)	0.0735*** (0.00734)			
h^2 (per author)	-0.00153*** (0.000274)	-0.00201*** (0.000311)	-0.00203*** (0.000415)			
Log (Cum Cites*+1)				-0.00228 (0.0115)	0.0280 (0.0145)	0.0356* (0.0143)
Log(Cum Cites*+1)^2				0.0168*** (0.00168)	0.0133*** (0.00182)	0.00854*** (0.00201)
Experience		0.0122*** (0.00349)	0.0136*** (0.00401)		0.0118** (0.00386)	0.0129*** (0.00387)
Experience^2		-0.000144* (0.0000690)	-0.000215* (0.0000859)		-0.000143 (0.0000753)	-0.000214** (0.0000765)
Seniority		-0.0238*** (0.00316)	-0.0220*** (0.00361)		-0.0243*** (0.00317)	-0.0227*** (0.00316)
Seniority^2		0.000371*** (0.0000762)	0.000350*** (0.0000880)		0.000381*** (0.0000767)	0.000374*** (0.0000768)
Male		0.0145 (0.0212)	0.00898 (0.0180)		0.0153 (0.0214)	0.0102 (0.0211)
# Elite Articles			0.0121** (0.00375)			0.0112*** (0.00285)
# Excellent Articles			0.00225 (0.00157)			0.00272* (0.00109)
# Other Articles			0.00109 (0.000650)			0.00143** (0.000527)
Constant	11.34*** (0.0136)	11.38*** (0.0242)	11.37*** (0.0195)	11.37*** (0.0178)	11.38*** (0.0247)	11.37*** (0.0246)
R^2	0.512	0.557	0.568	0.505	0.552	0.565

Dependent variable is ln(Salary). Standard errors in parentheses. P-values: * p<0.05, ** p<0.01*** p<0.001

Table 8a

Log Likelihood Values for Different

Models of Coauthorship

c	Log likelihood value
0	109.1088
1	98.6715

"Conservative" LR Test Statistic = 20.87

Table 8b

Log Likelihood Values for Different

Models of Coauthorship using Log Cumulative Citations

c	Log likelihood
0	102.8831511
.25	102.2588632
.5	100.6923021
.75	98.25933209
1.0	95.10564948

"Conservative" LR test Statistic = 15.555

Table 9

Ordered Probit Regression Model
Dependent variable is 1995 NRC Rank
Citations Variables Not Adjusted for Coauthorship

	Model			
Variable	(1)	(2)	(3)	(4)
h	-0.232***	-0.213***		
	(0.0432)	(0.0450)		
h^2	0.00646***	0.00528**		
	(0.00168)	(0.00178)		
Log (Cum Cites +1)			-0.246	-0.302
			(0.170)	(0.176)
Log $(\text{Cum Cites}+1)^2$			-0.0149	-0.00594
			(0.0206)	(0.0225)
Year of PhD	-0.0475***	-0.0442**	-0.0555***	-0.0442**
	(0.0136)	(0.0143)	(0.0140)	(0.0148)
Male	0.0372	0.0795	0.00628	0.0385
	(0.180)	(0.181)	(0.180)	(0.180)
# Elite articles		-0.0972***		-0.0878***
		(0.0253)		(0.0260)
# Excellent articles		0.0157		0.0122
		(0.0104)		(0.0102)
# Other articles		0.0170***		0.0169***
		(0.00501)		(0.00451)
Log Likelihood	-830.99	-816.06	-827.04	-813.73
N	232	232	232	232

Standard errors in parentheses. P values: p<0.05 **, p<0.01, *** p<0.001

Table 10

Ordered Probit Regression Model
Dependent variable is 1995 NRC Rank
Citations Variables Adjusted for Coauthorship

Variable	Model (1)	(2)	(3)	(4)
h (per author)	-0.289***	-0.279***		
	(0.0569)	(0.0592)		
h^2 (per author)	0.00905**	0.00849**		
	(0.00287)	(0.00293)		
Log (Cum Cites +1)			-0.326	-0.378*
			(0.173)	(0.176)
Log $(\text{Cum Cites}+1)^2$			-0.0107	-0.00172
			(0.0225)	(0.0241)
Year of PhD	-0.0537***	-0.0456**	-0.0585***	-0.0471**
	(0.0133)	(0.0143)	(0.0139)	(0.0148)
Male	0.0701	0.106	-0.00271	0.0291
	(0.180)	(0.181)	(0.180)	(0.180)
# Elite articles		-0.0919***		-0.0876***
		(0.0252)		(0.0257)
# Excellent articles		0.0157		0.0135
		(0.0103)		(0.0102)
# Other articles		0.0167***		0.0166***
		(0.00459)		(0.00448)
Log Likelihood	-829.01	-814.72	-825.04	-811.81
N	232	232	232	232

Standard errors in parentheses. P values: p<0.05 **, p<0.01, *** p<0.001

Figure 1: Distribution of log citations by "mature" faculty over NRC Rank

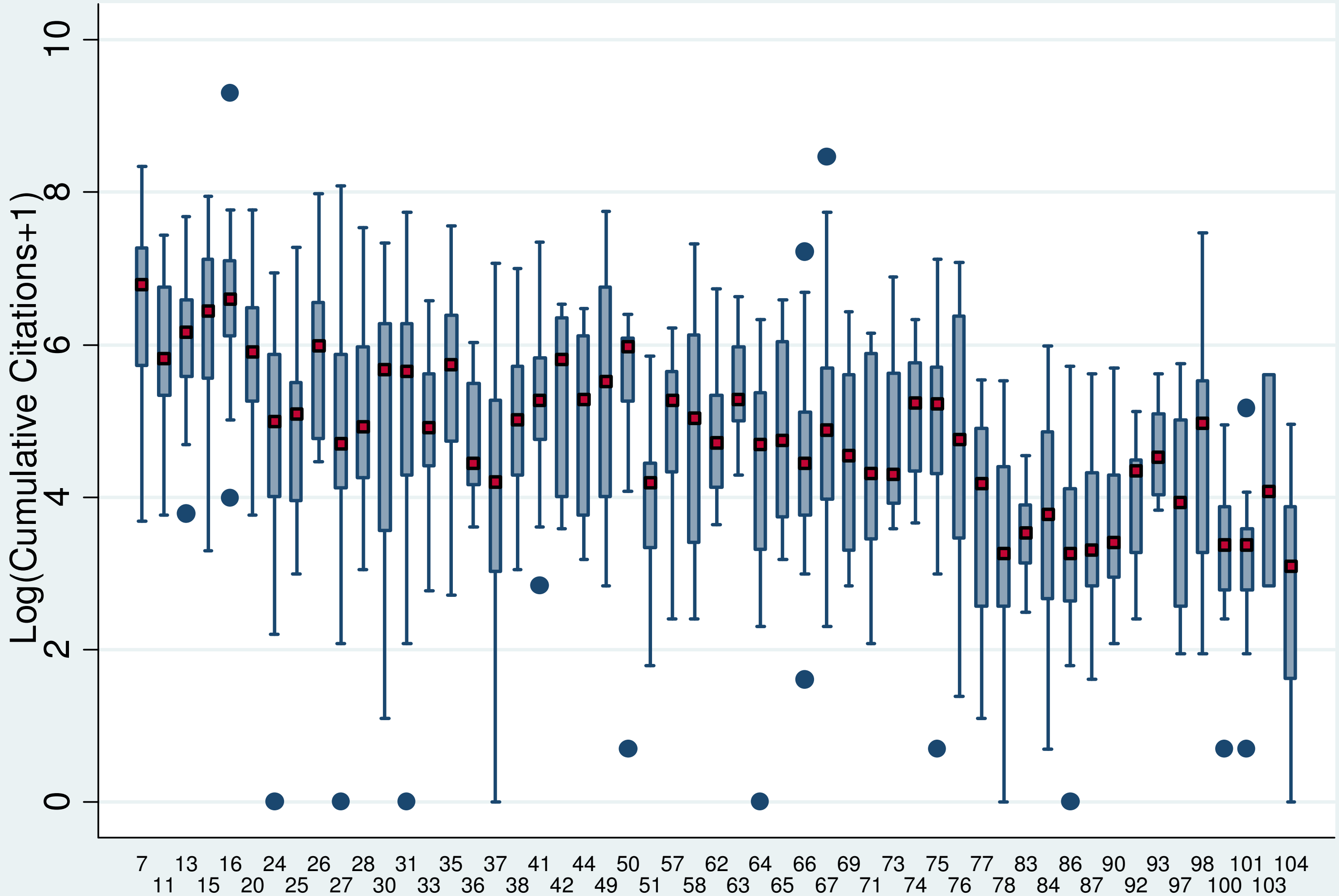

Figure 2: Distribution of Salaries for "mature" faculty, over NRC Rank