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Six Decades of Top Economics Publishing: Who and How?

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Presenting data on all full-length articles in the three top general economics journals for one year in each decade 1960s–2010s, I analyze changes in patterns of coauthorship, age structure and methodology, and their possible causes. The distribution of number of authors has shifted steadily rightward. In the last two decades, the fraction of older authors has almost quadrupled. Top journals are publishing many fewer papers that represent pure theory, regardless of subfield, somewhat less empirical work based on publicly available data sets, and many more empirical studies based on data collected by the author(s) or on laboratory or field experiments. (*JEL* A14)

1. *Introduction*

Navel-gazing has been a favorite activity of economists (and other academics) for at least sixty years. Stigler (1959) discussed the effect of economics training on political views, and the Committee on the National Science Foundation Report on the Economics Profession (1965) discussed NSF data on the labor market for economists. One hopes that the rationale for this activity is that it stimulates more than just a prurient interest, and that it can enhance our understanding of the process of scientific discovery, the nature of interpersonal interactions, and the role of rewards and incentives in stimulating activity. These last are my purposes here too—but I also hope to provide the enjoyment that contemplating our navels might offer.

The novelty here is several-fold. First, the journal literature studied is a sample of articles published in the leading general economics journals in six consecutive decades, thus offering a long-term perspective on trends in the demographics and focus of economic research at the highest levels. Second, I examine changes in the age structure of authors and in the methods they use (not their topics), neither of which appears to have been considered before. Finally, in addition to presenting some new facts, I offer opinions and possible explanations for them. The purpose is not to test the roles of possible causes underlying the phenomena shown here, but to stimulate speculation and hopefully to generate formal examinations of them.

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2. *The Data*

The sample consists of the 748 full-length refereed articles published in the *American Economic Review* (*AER*), *Journal of Political Economy* (*JPE*), and *Quarterly Journal of Economics* (*QJE*), the leading American general economics journals, in one year in each of the past six decades: 1963, 1973, 1983, 1993, 2003, and 2011. I exclude notes, comments/replies, and addresses/speeches.[1] There are 1,269 names attached to these papers, representing 1,100 different authors. The data collected for each article/author are the number of authors on each paper and each author's gender (both easy to obtain), each author's age (more difficult, and unobtainable for one author of a single-authored paper in 1963), and the methodology employed (acquired by skimming each paper). I classify methods into five types: theory, theory with simulation, empirical using borrowed data, empirical using self-generated data, and experiment. Theory with simulation includes calibration in macroeconomics; borrowed data are all data sets that are copied directly from books (the old technology) or provided electronically; self-generated data include data sets assembled from diverse electronic or other sources; and experiments include both laboratory work and author-initiated field experiments.[2]

3. *The Demographics of Authorship and Coauthorship*

Table 1 presents the changing age and gender distributions of authors of articles in these three leading publications.[3] In the first four decades of the sample, there was very little change in the age structure of authorship. Only a tiny fraction of authors were older than 50, with roughly half being 35 or less, consistent with Lehman's (1953) path-breaking results on the age distribution at which creative achievements were achieved in a wide range of fields.[4] By 2003 and 2011, the age distribution of authors of top-journal publications had shifted markedly rightward, so that today nearly 20 percent of authors are 51 or older, with around 6 percent being over 60.

These changes in the age structure are striking, and their causes have apparently not been examined. Some candidate explanations might be:

1. People are starting their careers later, causing an increasing left-truncation of the age distribution. The median age at doctorate in economics in the United States was 32.5 in the early 1960s and fell to 30.6 by the late 1970s. It did rise to 32.3 by the early 1990s, but from then to the mid-2000s it fell back to 31.7 (Scott and Siegfried 2008). This explanation is thus inconsistent with the facts. Perhaps, though, the average age of faculty, as opposed to all Ph.D.s, has risen due to secular declines in new hires.[5]
2. The publishing process in economics has slowed considerably (as Ellison 2002 documents), perhaps by two years. Taking all the papers from 1963–93 and

[1] I used the data for the first four years in Hamermesh (1996). I chose 1963 for personal reasons—I started writing publishable articles in 1964—and 2011 was the most recent available year.

[2] Because of the tremendous changes that have taken place in publishing over these six decades, I could not classify seventeen articles published in 1963 under any of these rubrics.

[3] The means and distributions are all weighted by the inverse of the number of authors of each paper. Inferences from unweighted data are nearly identical.

[4] The minimum age in the sample was 24, the maximum was 77.

[5] A slightly related possibility is that editors are now older and tend to favor their contemporaries. The latter may be true; but the article-weighted age of editors who would have handled the 1963 papers was 53, that of the editors and coeditors who would have handled the 2011 papers was 52.

TABLE 1
Age and Gender Distributions of Authors of Articles in Top Economics Journals, 1963–2011*

Year	Age (percent distribution)				Percent female
	< = 35	36–50	51–60	61+	
1963	50.5	45.3	2.4	1.8	4.7
1973	61.5	32.6	5.9	0	3.4
1983	48.5	47.2	3.5	0.8	6.8
1993	49.8	43.1	5.6	1.5	9.3
2003	36.8	50.4	10.7	2.1	10.3
2011	33.0	48.1	13.0	5.9	12.6

* Here and in all other tables the results are based on the *American Economic Review*, *Journal of Political Economy,* and *Quarterly Journal of Economics*. The population excludes all Presidential and Nobel addresses, comments, replies, and notes. The statistics here and in tables 3–6 are weighted by the inverse of the number of authors on each article. The age of one author in 1963 was unavailable.

adding two years to each author's age, the weighted distribution of authorship would have been 27.9 percent, 64.5 percent, 5.9 percent, and 1.7 percent. In the two older categories, this is little different from the actual distribution in 1993, but much different from the actual distribution in 2011. This explanation accounts for very little.

3. The internationalization of the profession has resulted in older, foreign-based scholars substituting for their younger, North American counterparts in these samples. It is true that the share of United States/Canada based authors fell (from 92 percent in 1963–93 to 83 percent in 2003 and 2011); but in the last two years, the average age of authors based in the United States/Canada was 41.0, but was 40.7 of those based elsewhere. This explanation is wrong.
4. The publishing slowdown, coupled with unchanging and short tenure clocks, may have created incentives for younger scholars to shy away from these top journals (where the acceptance rates today average 7 percent) to top-level field journals, where the likelihood of an article being accepted is greater. There is some evidence for the highest-ranked departments showing a shift away from peer review (Ellison 2011). On the other hand, the scarcity value of publishing in one of these journals has increased, presumably along with the effects of such publication on the likelihood of being granted tenure.
5. The increasing complexity and specialization in this "science" may have increased the "incubation" time before one can publish top-notch articles (see Jones 2009). Whether this is consistent with the changing methodology of leading publications (see the next section) is not clear. Perhaps too, as the field has matured the rate of obsolescence of one's graduate education and early training has slowed.
6. Perhaps older economists are now healthier and more energetic than

those in previous cohorts. This may be true for those ages 61+, but 55-year-old professors in the 1980s were hardly decrepit; and at least in the aggregate the improvement in health in this age range seems minor.[6]

7. The abolition of mandatory retirement for faculty in 1994 has increased the monetary incentives to continue publishing. Salaries of senior professors have fallen sharply relative to those of junior professors. This might have reduced incentives for junior faculty to publish (and attain promotion and full-professor salaries).[7]
8. The growth of consulting opportunities is hard to document, but their lures may provide a growing incentive to publish well while young to establish one's *bona* fides in the lucrative consulting world. This would shift the age distribution leftward, opposite to what has occurred. The continuing growth in the relative demand for provostlets and deanlets, who I assume cease contributing to the scholarly literature, provides an additional incentive in this, the opposite direction from what we observe.

Table 1 also shows the sharp increase in the fraction of authors who are women, with the share of female authors nearly tripling over this period. This is clearly the result of the increasing femaleness of the profession. While the share of female authors in the 1963 and 1973 samples is not much different from the female share of new doctorates in those years, however, the growing share of female doctorates far outpaced the growing share of authors in these top journals.[8] Moreover, the female share of authors is now far below the female share of tenure-stream faculty at Ph.D.-granting institutions (Scott and Siegfried 2012).

Categorizing authorship by age and gender, it is notable that, in 2003 and 2011, women ages 35 or less accounted for 16 percent of all authors in that age group, an increase, but still far below the 29 percent female representation among assistant professors at Ph.D.-granting institutions in 2011–12 (Scott and Siegfried 2012). Whatever the causation, perhaps this deficit explains the greater (and uniquely greater to economics) female survival rate without tenure in this profession (Ginther and Kahn 2004).

Many students of the sociology of economics have pointed out the increase in coauthorship (e.g., Hollis 2001), which, as the first column in table 2 shows, has proceeded over the entire last half century. What is less well known is that the frequency distribution of the number of authors per article has been moving steadily rightwards, as the second through fourth columns of the table show. The first four-authored paper in this sample appeared in 1993, and the first five- and six-authored papers did not appear in this sample until 2011.[9]

Why has this change occurred? A few possibilities suggest themselves and are worth exploring:

1. The degree of complexity of economic research has increased to the point that it is very difficult for single individuals to

[6] Among people 55–64, the percentage rating their health as fair or poor has declined only slightly, from 20.7 percent in 1991 to 19.4 percent in 2010 (National Center for Health Statistics 2011).

[7] In 1983–84, the ratio of academic-year salaries of full professors to those of assistant professors in Ph.D. granting economics departments was 1.77. It has fallen nearly steadily thereafter, to 1.57 in 2011–12. Thanks to Charles Scott for providing unpublished data for years before 1996–97.

[8] In the 1960s, the female share of new doctorates was below 5 percent, while from 2000 to 2006 it was around 30 percent (Scott and Siegfried 2008).

[9] I treat one many-authored paper from 1983 as having only the one senior author who appears to have been assisted by a large number of students.

TABLE 2
Distributions of the Number of Authors per Article, 1963–2011

Year	Pr{>1}	Pr{3+|2+}	Pr{4+|3 +}	Pr{5+|4+}	*N* articles	*N* authors
1963	16.3	0.0	0.0	0.0	86	100
1973	28.6	2.9	0.0	0.0	119	154
1983	45.6	14.0	0.0	0.0	125	190
1993	55.1	28.0	9.5	0.0	136	234
2003	74.1	28.0	21.4	0.0	135	269
2011	79.6	38.5	22.2	20.0	147	322

produce research that meets the highest standards of publication.

2. The creation of email, the Internet, and inexpensive travel have lowered the cost of coauthoring with noncolleagues. As Hamermesh and Oster (2002) show, distant coauthorships have sharply increased their share of all coauthorships.
3. Coauthoring is fun, especially with old friends or those in distant places to which one can travel for joint work and leisure.
4. Also on the supply side, in this increasingly rat-race world it is difficult to find people to read drafts of one's papers. Coauthoring obligates others to read one's work, since it is also their own.
5. The returns to having one's name on two two-authored papers exceed those of publishing one single-authored paper of equal quality. While Sauer (1988) demonstrated in the mid-1980s that the monetary payoff to a coauthored article was almost exactly half that of a sole-authored paper, one wonders whether that is still true today.[10]

The formation of coauthorships will depend on the potential productivity of possible partnerships and on individuals' preferences for forming coauthorships with other scholars of different ages (see McDowell and Melvin 1983 and Krapf 2012). How does this depend on the ages of potential authors? One's first reaction is that much of the coauthorship might be of the older European model, with the senior professor coauthoring with his/her Ph.D. student/recent graduate. The probit and ordered probit estimates in table 3 provide an initial suggestion that this may be the case, as authors ages 36 to 50, the most active mature scholars, are significantly and substantially more likely than younger or older authors to choose to coauthor.[11]

Going behind the estimates to particular coauthorships suggests that this model does not characterize most of these publications. Fifty-five percent of the two-authored papers in the sample are produced by people within five years of age (and in 2011 only two

[10] One school offers salary bonuses X for publications, graded by the quality of the journal, with the bonus equaling an amount $X/\sqrt{N}$, where N is the number of authors. One young economist told me that, in recognition of the profession's unwillingness to divide by N, a friend and he now put each other's names on each paper.

[11] Indicators for each journal are also included, with articles in the *AER* having significantly more authors than those in the other two journals. The average age in two-author articles ranges from 28 to 64, in three-authored articles from 30 to 56.

TABLE 3
PROBIT AND ORDERED PROBIT ESTIMATES OF THE DETERMINANTS OF COAUTHORSHIP*

Variable:	Multiple authors	Number of authors
Age 36–50	0.150	0.313
	(0.035)	(0.073)
Age 51–60	–0.023	–0.049
	(0.069)	(0.139)
Age 61+	0.074	0.013
	(0.124)	(0.205)
Female	–0.102	–0.229
	(0.062)	(0.128)
Time	0.015	0.038
	(0.001)	(0.002)
Pseudo-R^2	0.166	0.128

*The probit estimates are derivatives at the means. The ordered probit estimates are the parameters. The age category $\leq$ 35 is excluded. Each equation also contains indicators for the individual journals.

represented collaborations between young faculty and their current or recent Ph.D. student). The only (weak) evidence for this inference is that in only 35 percent of the eighty-five three-authored articles is the average absolute age difference among the authors five years or less, and in nearly half of them the oldest author is more than ten years older than the youngest.[12] At the very least, however, most the greater propensity of prime-age scholars to coauthor does not appear to be attributable chiefly to their publishing with Ph.D. students.

[12] In seven of the sixteen four-authored articles, the average absolute age difference is five years or less.

Using a sample of articles from these three journals for the 1990s, Boschini and Sjögren (2007) find women are less likely to coauthor than men. The probit and ordered probits in table 3, covering a much longer time period, weakly suggest the same conclusion. Moreover, an expanded specification that interacted gender with time showed that this difference has not changed over these six decades. To the extent that economics faculties do not "divide by *N*" in judging young faculty members' publications at tenure time, this deficit may also help explain the unusually high rates of "survival" without tenure among female economists. But when they do coauthor, women are also typically not "junior partners" to their male

TABLE 4
Percent Distributions of Methodology of Published Articles, 1963–2011*

Year	Type of study				
	Theory	Theory with simulation	Empirical: borrowed data	Empirical: own data	Experiment
1963	50.7	1.5	39.1	8.7	0
1973	54.6	4.2	37.0	4.2	0
1983	57.6	4.0	35.2	2.4	0.8
1993	32.4	7.3	47.8	8.8	3.7
2003	28.9	11.1	38.5	17.8	3.7
2011	19.1	8.8	29.9	34.0	8.2

*A type could not be assigned to seventeen of the articles published in 1963.

colleagues: In twenty-six of the forty two-authored mixed-gender coauthorships, the scholars are within five years of age.

4. *Changing Methodology and Its Demographics*

It is easy to obtain authors' classifications of their published papers by subject (*JEL* code), but subject does not automatically imply method: for example, one can imagine the currently in vogue method of field experiments being used in such broadly diverse areas as industrial organization, labor economics, and public economics; and a purely theoretical study could be published in almost any subject area. The issue here is not the subject, but rather the methodological focus of the top journals, its secular changes and their causes.

Table 4 presents the five-fold categorization of the methods used in these leading articles in the samples from each of the six decades (excluding those from 1963 that simply could not be classified under these rubrics). In the first three years in the sample, the leading journals almost exclusively published articles that were either theoretical or that contained empirical work based on ready-made data (typically government-provided macroeconomic time series or, beginning in the early 1970s, large household surveys that the author(s) laboriously obtained and massaged on a mainframe computer).[13] Since then, the share of purely theoretical articles has plummeted, with most of the decline taken up by empirical studies for which the author(s) created the data set. The rest of the decline is accounted for by growth in theory with simulation (mostly macroeconomic calibrations) and experimental work (either in a laboratory or in the field).

Why the changing focus in these top journals? Some possibilities are:

1. Changing technology in the form of the Internet has made it much easier to create one's own data by assembling

[13] Observing this pattern led one Nobel Prize winner to complain about the sterility of the field (Leontief 1982).

TABLE 5
MULTINOMIAL LOGIT ESTIMATES OF THE DEMOGRAPHICS OF METHODOLOGY*

Variable:	Theory	Theory with simulation	Empirical: borrowed data	Empirical: own data	Experiment
Age 36–50	0.015	–0.091	0	0.162	–0.141
	(0.140)	(0.253)		(0.198)	(0.364)
Age 51–60	0.850	–0.049	0	0.051	–0.223
	(0.279)	(0.497)		(0.390)	(0.679)
Age 61+	–0.099	–1.467	0	–0.693	–0.176
	(0.472)	(1.142)		(0.644)	(0.829)
Female	–1.064	–1.427	0	0.318	–0.571
	(0.291)	(0.626)		(0.266)	(0.608)
Time	–0.022	0.037	0	0.060	0.088
	(0.005)	(0.009)		(0.008)	(0.018)
Pseudo-R^2			0.077		

* The age category ≤ 35 is excluded. The equation also contains indicators for the individual journals.

information from a variety of previously unrelated sources. Similarly, the declining price and easier access to large-scale computing facilities has facilitated simulating/calibrating complex general equilibrium models.

2. The creation of economics laboratories, typically governmentally funded but, more than anything else due to path-breaking work by one economist, has generated a new methodological subfield that is reaching maturity.[14]
3. Economic theory may have become so abstruse that editors of the leading general journals, recognizing that very few of their readers could comprehend the theory, have cut back on publishing work of this type.

Table 5 presents multinomial logit estimates of a model describing the demographic correlates of the choice of methodology. Other than the time trends, which replicate the percentage distributions in table 4, the central results are (1) Women are much less

[14] The Nobel citation to Vernon Smith was, "For having **established** [bold mine] laboratory experiments as a tool in empirical economic analysis, especially in the study of alternative market mechanisms."

likely than men to publish theoretical papers, and (2) with one notable exception, there are no significant differences by age in the propensity to publish using different methodologies. Moreover, an expanded model shows that the differences, or lack of differences, have not changed over these six decades.[15]

The one significant age difference in method is the fact that older authors have been *more* likely than others to publish theory articles. This finding contradicts a claim made by a theorist in a lunchtime conversation, "Empirical work is what you do when you can't do theory any longer." The evidence from these repeated cross-sections suggests that assertion is wrong.

Cross-section data may not, however, be the correct test of this (to an elderly empirical researcher in a youth-oriented profession, very annoying) claim. Eighty-two authors appear in at least two different cross-sections (in different decades), so we can create an unbalanced panel (since some authors appear three or even four times) to remove person fixed effects. Fifty-five of these authors published at least one theoretical paper. Of these, 60 percent published only in theory (with or without simulations), 9 percent published an empirical paper before a theoretical one, and 31 percent published a theoretical article before an empirical one.[16] But this result is due solely to the secular decrease in theory papers in these journals: looking only at longitudinal data from 1963 to 1993, the few authors who did switch are as likely to move from empirical work to theory as vice-versa. The claim is simply wrong.

The simultaneous trends in the top general journals away from theory and toward increasingly older authors are consistent with each other and with the observation (Lehman 1953, across disciplines; Weinberg and Galenson 2005, for methodologies in economics) that thinkers reach their peak productivity at younger ages in areas requiring more mathematical thinking. They are, however, inconsistent with this evidence on the age distribution of authors by type of method used.

The market determination of the type of methodology appearing in top journals has changed, whether because of changes in editors' preferences (either their own, or as agents for preferences of members of the profession) or because of changes in authors' preferences and production technologies. So too the propensity to coauthor has changed over time, although the changes are presumably the result of changing conditions on the supply (of scholarship) side. I have assumed that both trends have resulted from many possibly exogenous shocks, including the demographics that I have identified. But even though I do not claim that it might be causative, is there any interaction of these trends?

Table 6 presents estimates of a multinomial logit like that in table 5, but excluding the demographic variables and including only indicators for the number of authors (two, three or more, with sole authorship the excluded category).[17] The coefficients on the vector of indicators of number of authors are jointly significant ($\chi^2(8) = 35.62, p < 0.001$) and show that coauthorship, and especially multiple authorship, is more common in articles with self-generated or experimental outcomes than in other types of studies.

[15] The equations also include indicators for each journal. There are significant differences in methods in these articles across the journals, with the *QJE* being more likely to publish purely theoretical papers and those with self-generated data, and both the *JPE* and the *QJE* being less likely than the *AER* to publish experiments.

[16] Taking the twenty-two "methodological switchers," the probability that we would observe so many more switching in one direction instead of the other is 0.002.

[17] An equivalent way of examining this correlation is to estimate an ordered probit on the number of authors, with indicators for the type of methodology as explanatory variables. Not surprisingly, that model gives the same conclusions as the multinomial logit discussed in the text.

TABLE 6
MULTINOMIAL LOGIT ESTIMATES OF THE RELATION BETWEEN METHODOLOGY AND COAUTHORSHIP*

Variable:	Theory	Theory with simulation	Empirical: borrowed data	Empirical: own data	Experiment
Two authors	–0.186	–0.207	0	0.107	0.986
	(0.147)	(0.278)		(0.226)	(0.624)
> 2 authors	–0.394	0.274	0	0.723	2.238
	(0.252)	(0.361)		(0.276)	(0.632)
Pseudo-R^2			0.082		

* The equation also contains a time trend and indicators for the individual journals.

Unsurprisingly, theory is especially unlikely to be the result of collaborations.

One might think that these patterns result from the simultaneous trends toward more authors per article and self-generated data and experiments. They do not: Adding interactions of the numbers of authors and the time trend to the specification underlying table 6 yields terms that are jointly insignificant ($\chi^2(8) = 8.98$, $p = 0.34$) and individually statistically insignificant in seven cases. The trends in the leading general journals toward increasing numbers of authors on each article and away from theory have essentially been independent.

5. *Where Is Publication Heading?*

Predicting changes in age structure of top-level authorship in economics is easy. Barring some new, fundamentally different methodological approach for which the skills are learned mostly by new or recent Ph.D.s (essentially as occurred with experimental methods), we will not see a return to top-level publishing as a strikingly young person's game. That prediction is reinforced by my guess that the age distribution of academic economists will not shift leftward. The abolition of mandatory retirement will lead to more people staying on after age 70, and it is unlikely that we will see a hiring boom of young people at public institutions, which constitute the overwhelming majority of the academic labor market.

We also will not see coauthorship diminishing. The same forces that have created incentives for multiple authoring are, if anything, becoming stronger. Entries in table 2 for future decades are likely to show even higher percentages in the first four columns.

As important as they are, even viewed over the intermediate term of the six decades covered here, the methodological innovations that have captivated the major journals in the past two decades—experimentation, and obtaining one's own unusual data to examine causal effects—are unlikely to be any more permanent than was the profession's fascination with variants of micro theory, growth theory, and publicly available data in the 1960s and 1970s. No doubt

they will eventually give way in part to new approaches based on new methodological innovations. Not in the next few years, but surely as reflected in leading journals if a replication of this study is undertaken in 2043. Indeed, if it were not demonstrable then, an impartial observer would reasonably conclude that the field had become remarkably stagnant and inbred.

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