



Why are professors “Poorly paid”?

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1. Introduction

An immense ongoing literature extending back at least to the early 1970s has provided econometric evidence on the determinants of salaries of economists (Hilmer, Ransom, & Hilmer, 2015; Johnson & Stafford, 1974a).¹ The econometric literature on salary determination more generally in academe is also extensive and continuing, with substantial concentration on differences by gender (Johnson & Stafford, 1974b; McDonald & Sorensen, 2017). Far less research has provided evidence on how earnings of university faculty differ from those in other professions and from workers generally. A few comparisons of averages exist (AAUP, 2002, Figure 4; AAUP, 2006, Figure 3), and a comparison of long-term trends in relative earnings (in Germany) is available (Sohn, 2016).

Apparently missing from this literature is a detailed comparison of how the earnings of university instructors differ from those of otherwise identical workers who have spent the same amount of time in formal schooling, which is the relevant measure of the purely pecuniary advantage/disadvantage of being in academe. Even more important, there is no econometric evidence exploring the underlying causes of any (adjusted) earnings differential between academics and other highly-educated workers. Here I use a variety of data sets, including two publicly-available nationally representative American surveys and an online survey of academic economists that I conducted, to shed light on these issues.

2. Are they really paid poorly?

To examine these pay differentials, I first use the American Community Survey (ACS) for 2012–16, restricting the sample to those respondents who indicated that they had a doctoral degree (referred to hereafter as doctorate-holders). In the ACS these are almost all Ph.D.s or

Ed.D.s. J.D.-holders, M.D.s and others with advanced professional degrees are excluded from the samples used here and in the next section. Other restrictions required that the respondent report usually working at least 20 hours per week. A doctorate-holder who indicated an occupation of “postsecondary teacher” was coded as an academic; the other doctorate-holders included in the sample were not.² The ACS provides information on annual earnings, which I use for comparisons throughout this section.

While I hold constant for various demographic characteristics of the postsecondary teachers and other doctorates in multivariate regressions, the two groups are very similar in the ACS. In both the average age is 51.5 years; 48.5% of other doctorates are men, whereas 48.7% of postsecondary teachers with doctorates are male; and 55.9% of other doctorates are married, while 55.4% of postsecondary teachers are.

The upper panel of Table 1 presents statistics describing the earnings of these doctorate-holders. Comparing pay differences at various quantiles of the distributions, near the bottom of the pay distributions academics earn more than other doctorate-holders; but the differences rise steadily as we move up the earnings distributions, with academics’ pay beginning to fall below that of other doctorate-holders at the 17th percentiles of the distributions. At the 25th percentiles of the distributions the earnings advantage has turned into a disadvantage of 6%; at the medians it is 19%; and it rises to an astounding 50% disadvantage at the 95th percentiles. At the means academics receive 24% lower pay than non-academic doctorate-holders.³ Although on average professors appear poorly paid compared to other doctorate-holders, their average annual earnings are 92% above those of workers without doctorates (who are of the same age and sex, and who have a workweek of the same length of at least 20 h).

Even though the means of the most important demographic characteristics do not differ between the two groups, these raw differences in earnings might be generated by differences between the two groups

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¹ Bok (1993) is a good general discussion of the compensation of academics and other highly-educated professionals.

² The code for this group is 116 on the variable *educd* in the ACS. As postsecondary teachers I code those listing 2200 in the variable *occ*. The postsecondary teachers were in industry 7870, postsecondary education. The other doctorate-holders were widely dispersed across industries, but nearly one-fourth were in professional, scientific, etc., services, and another fourth were in educational, health and social services.

³ The pattern of earnings differentials is similar if we add doctorate-holders who usually worked fewer than 20 hours per week (since their addition expands the sample by only four %).

Table 1
Annual earnings of the highly-educated, workers half-time or more, ACS 2012–16.

	Quantile Mean and SE	5	25	50	75	95	N
Academics	\$91,902 (429)	\$23,072	\$56,417	\$81,104	\$109,043	\$197,464	23,804
Other Doctorates	\$121,704 (374)	\$20,895	\$60,000	\$99,808	\$144,749	\$394,058	74,081
	ln(Weekly Earnings), Parameter Estimate, Indicator Academic = 1 (N = 97,885)						
	OLS Estimate			Quantile Estimate			
	−0.185 (0.006)	0.132 (0.012)	−0.080 (0.007)	−0.225 (0.005)	−0.281 (0.006)	−0.582 (0.008)	

Notes: Standard errors in parentheses below means and coefficients. All estimates use sampling weights. Other doctorate-holders have a Ph.D., Ed.D. or other doctorate, but are not postsecondary teachers. All the estimating equations include as controls: Quadratics in usual weekly hours and age, indicators for gender and marital status, and vectors of indicators of metropolitan status, survey year and state of residence.

in other characteristics and in the distributions of these demographics. To examine this possibility in a regression context I relate the logarithm of earnings to an indicator of being in academe or not, including as control variables many of the respondents' demographic and economic characteristics.⁴ The least-squares estimate of the adjusted pay difference between professors and other advanced-degree-holders shows a disadvantage of about 17%. Quantile estimates of the same equation yield essentially the same conclusions as the comparisons of unadjusted earnings at various percentiles. At the 25th percentile the adjusted earnings disadvantage is 8%; at the median the pay disadvantage is about 20%, and it rises steadily moving further up the pay distribution. Professors are “poorly paid” compared to others with the same educational attainment and many other demographic characteristics.⁵

The ACS for 2012–16 provides information on the field of the undergraduate degree of those respondents who have at least a bachelor's degree, not on the field of doctorate-degree holders. In our sub-sample about 26% of the respondents who list their undergraduate fields have degrees in STEM. Not all those who have doctorates in STEM fields majored in them as undergraduates; but linking undergraduate to graduate field is probably a closer link than it would be for other doctoral fields.⁶

As a rough cut to see whether the academics' earnings disadvantage differs by field, I thus distinguish between those doctorate-holders with undergraduate STEM specialties and others, re-estimating the OLS equations separately by an indicator of STEM as an undergraduate major. The estimated disadvantage was −0.195 log-points for doctorate-holders who had been STEM majors, −0.183 log points among others. At least with this broad cut of the data, there is little evidence of any important difference in the wage disadvantage across fields between academics and other doctorate-holders.⁷

Professors have a disadvantage in their earnings compared to non-academic doctorate-holders. Perhaps, however, that shortfall is at least partly compensated for by more generous employee benefits in academe. No large survey provides micro data on employee benefits of academics and other doctorates; but the annual *AAUP Report on Academic Compensation* for 2017–18 (AAUP, 2018) shows that among

the entire professoriate non-wage monetary compensation was 35.3% of salaries. The BLS *Employer Cost of Employee Compensation* (BLS, 2018) indicates that in 2017 non-wage monetary benefits equaled 35.4% of wages and salaries among all management, professional and related occupations. This comparison implies that the disadvantage in compensation facing professors is the same as that demonstrated here in earnings.

3. What causes the pay disadvantage?

3.1. The temporal distribution of work

The American Time Use Survey (ATUS), 2003–2015, provides enough observations on academics and other doctorate-holders to draw reliable inferences about how differences in work time and timing might account for some of the pay disadvantage in academe. The ATUS takes a sub-sample of people who were recent CPS respondents and asks them to complete diaries cataloging their activities on the previous day (Hamermesh, Frazis & Stewart, 2005). Using the same restrictions as in Section 2 to create a sub-sample of doctorate-holders yields 481 doctorate-holders in university teaching and 1622 other doctorate-holders. 23% of the ATUS sample are academics compared to 24% in the much larger ACS sample.

Table 2 presents various statistics describing the work time of these doctorate-holders. As seen in the top row of the table, recalled usual weekly hours (the standard CPS measure, which is also included in the ATUS) are slightly higher among academics. The second row presents estimates of the work time reported in the time diaries, calculated by averaging over days to obtain the implied work hours in a representative week.⁸ Like recalled hours, diary workhours are also higher among academics than among non-academic doctorate-holders. In both groups the weekly hours implied by the time diaries exceed recalled usual hours, an excess that is larger among academics. But for both groups diary workhours are not much different from recalled hours.

While average hours are similar in the two groups, their temporal distributions differ significantly. As the third and fourth rows of Table 2 show, professors do much more of their work on weekends than do other doctorate-holders, and they do very slightly less during weekdays. They put in nearly 50% more worktime on weekends than other highly-educated workers (and 50% more than less-educated workers too).

⁸ The measure of work time is the variable *bls_work* provided in the ATUS-X. This includes time spent commuting to/from a workplace, which differs only very slightly between academics and other doctorate-holders. The 46 hours are well below the work time reported in the large national sample of professors used by Allgood and Walstad (2013). The difference might result from differences in the survey questions or perhaps from that survey's basis in very long recall.

⁴ These are quadratics in usual weekly hours and age, indicators of gender and marital status and vectors of indicators of metropolitan status, survey year and state of residence.

⁵ Adding racial/ethnic indicators to these equations hardly changes the estimates, nor does adding the small number of very part-time workers. The changes in the estimates are tiny if we restrict the sample to workers under age 70, and if we exclude all immigrants from the sample.

⁶ Given the coding of undergraduate majors in the ACS, of those whom I classify as STEM majors over 90 percent studied engineering, biology/life sciences, physical sciences or medical/health sciences.

⁷ The differences between academics and other doctorate-holders at each of the quantiles listed in Table 1 also differ only minutely between STEM graduates and others.

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