

Time-to-Degree for the Economics Ph.D. Class of 2001–2002

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Based on the median salary for full-time jobs held by new Ph.D. economists in the United States, a rough estimate of the opportunity cost of taking an additional year to earn an economics Ph.D. was \$74,000 in 2002.¹ The median time required to earn a Ph.D. for the class of 2002 was 5.5 years, up from 5.25 years for the class of 1997.² If the three-month difference is interpreted as 200 students (i.e., roughly one-quarter of the class of 2002) taking a year longer to complete their degrees and get a job than did their counterparts from the class of 1997, it implies an increase from 1997 to 2002 in the *annual* opportunity cost of producing Ph.D.

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¹ The foregone first-year salary is \$74,000. The present value of the opportunity cost of delaying graduation a year also depends on the growth rate of starting salaries, changes in the earnings profile of Ph.D. economists over time, and the extent to which those who take an extra year to complete their degree delay entry into the labor market.

² Elapsed time-to-degree is biased upward during periods when the size of entering cohorts falls, as occurred in economics Ph.D. programs from 1997 to 2002, because successively smaller entering cohorts cannot fully replace the number of fast recipients from larger, earlier entering cohorts (William G. Bowen et al., 1990). Thus, the rising median time-to-degree for Ph.D.s from 1997 through 2002 may be partly a statistical artifact. Our cross-sectional comparisons should not be affected by this phenomenon. The *mean* times-to-degree for the 1997 and 2002 samples are 5.8 and 6.0 years. The difference between the means is not statistically significant at the 0.05 level.

economists exceeding \$14.5 million.³ A growing elapsed time required to earn a Ph.D. also may affect application and matriculation decisions of students who are weighing alternative careers (T. Aldrich Finegan et al., 2006).

We examine the time required to earn a Ph.D. in economics for those graduating between July 1, 2001, and June 30, 2002, using survey responses from 398 graduates and 121 thesis advisors of nonrespondents among the cohort.⁴ The 519 graduates for whom we have information comprise 61 percent of the 850 individuals estimated to have earned a Ph.D. in the United States in 2002 (Siegfried and Stock, 2004). Based on survey responses from the graduates, we examine whether demographic attributes, type of undergraduate training, and type of financial aid are systematically related to either the time required to write a dissertation or to earn a Ph.D. Using a similar earlier survey (Siegfried and Stock, 2001), we also compare time-to-degree across cohorts.

I. Measuring Elapsed Time-to-Degree

To measure the time required to earn a Ph.D., we use responses from graduates (or their thesis advisors) to two questions: “When did you (your student) begin the Ph.D. program?” and “When was your (your student’s) Ph.D. awarded?” Respondents were asked to ignore master’s degrees earned on route to a Ph.D. and to use the date on their diploma rather than their thesis defense or graduation ceremony as the date when their Ph.D. was awarded. We

³ Time-to-degree grew from 1997 to 2002 in spite of an improving market for new Ph.D. economists, suggesting the underlying trend is real. While the number of new Ph.D.s declined from about 950 in 1997 to 850 in 2002, new job listings in *Job Openings for Economists* grew from 1,613 to 2,168. Normally, one would expect time-to-degree to decline rather than expand as the job market improves and opportunity cost rises (Ehrenberg and Mavros, 1995).

⁴ For a detailed description of the survey, response rates, and possible response biases, see Siegfried and Stock (2004).

tabulate the period between entering the program and the date on a graduate's diploma, and whether or not all of this time was spent in residence, formally registered, or in full-time study.⁵

National Science Foundation (NSF) data from the *Survey of Earned Doctorates* record the median years economics students are registered in any graduate program before earning a Ph.D. as 6.8 in 1996 and 7.0 in 2001 (Siegfried and Stock, 2004). NSF estimates of time-to-degree are about 1.5 years longer than ours, but the increase from 1996 to 2001 reported by NSF is consistent with the increase found in our surveys. Just over half of our sample of people earning a Ph.D. in economics earned a prior graduate degree from a different institution before enrolling in a U.S. economics Ph.D. program. Most were master's degrees in economics. Because master's-level programs in economics take about 1.6 years (James P. McCoy and Martin I. Milkman, 1995), if the graduate at the median time-to-degree in our sample earned a master's degree in economics and immediately enrolled in a Ph.D. program, our time-to-degree estimates reconcile well with those from the NSF.

II. Time-to-Degree Outcomes

Median times-to-degree and to other stages in the Ph.D. process reported by the 2002 economics Ph.D. cohort are shown by demographic and graduate program characteristics in Table 1.⁶ Because of substantial differences across institutions in policies related to thesis topic approval and completion of all other nondissertation requirements, we use the longest of the intervals from matriculation to the completion of course

⁵ Time-to-degree includes the interval between when students complete their dissertation and when they are awarded their degree. Among our respondents, the mean gap between completing the thesis and receiving the Ph.D. is 2.1 months; 216 respondents reported that they completed their thesis at least one month prior to earning their degree. While the mean time-to-degree was six years in 2002, the mean interval from matriculation until the thesis was completed was five years and ten months.

⁶ The number of observations reported in Table 1 is fewer than 398 because the sample underlying Table 1 is restricted to include only observations with complete information on each of the reported outcomes.

work, core exams, or field exams to measure the time to attainment of all-but-dissertation (ABD) status. Our measure of the time required to write a dissertation is the time from attaining ABD status until the dissertation is completed and includes time spent deciding on a thesis topic and getting it approved.⁷ Table 1 shows that more than half of the time required to earn a Ph.D. is spent writing a dissertation.

Not surprisingly, students who had a child during their Ph.D. program took longer than those who did not. Those who completed their degree before starting a job finished faster. Although the median time-to-degree and dissertation writing time is longer for females and for U.S. citizens, these differences disappear once we control for other factors.

We classify respondents' undergraduate colleges into six categories: U.S. universities offering a Ph.D. in economics; *U.S. News & World Report's* top-50 private liberal arts colleges in 2004, plus Dartmouth, Miami (Ohio), Richmond, Trinity University, Tufts, and William and Mary (highly selective institutions with few graduate programs, but not classified as private liberal arts colleges); other public and private institutions in the United States; universities in the United Kingdom, Ireland, Canada, Australia, and New Zealand; universities in continental Europe; and other foreign institutions.

Table 1 shows that Ph.D.s holding undergraduate degrees from foreign institutions have the shortest time-to-degree. Those who completed their undergraduate work at U.S. Ph.D.-granting institutions have the longest time-to-degree, due primarily to longer dissertation writing time. Graduates who earned their Ph.D. from tier 1–4 institutions (ranked 1 to 48 by Marvin Goldberger, Brendan A. Maher, and Pamela E. Flateau, 1995) completed their degree about a year earlier than those who graduated from institutions ranked below 48. This difference may reflect pressure to finish imposed on Ph.D. students by the more research-active dissertation

⁷ Seventeen graduates reported completing course work or exams *after* they either had their thesis topic approved or considered themselves as having completed all nondissertation requirements for their Ph.D. For these graduates, we used the later of the date their thesis topic was approved or the date they reported completing all nondissertation requirements as the date of their attainment of ABD status.

TABLE 1—ELAPSED TIME-TO-DEGREE, TIME-TO-CORE EXAMS, TIME-TO-ABD, AND TIME-TO-WRITE DISSERTATION FOR 2001–2002 ECONOMICS PH.D. GRADUATES

	Median years to				N
	Degree ^b	Core exams	ABD ^c	Write dissertation ^d	
Full Sample ^a	5.5	1.0	2.4	2.9	358
<i>Demographic characteristics</i>					
Male	5.4	0.9	2.4	2.8	258
Female	5.8	1.0	2.3	3.3	99
U.S. citizen	5.9	1.0	2.7	3.1	170
Non-U.S. citizen	5.1	0.9	2.2	2.8	187
Had child during graduate school	5.8	1.0	2.4	3.0	47
Did not have child during graduate school	5.4	0.9	2.4	2.9	310
With prior degree in economics	5.6	0.9	2.4	2.9	281
Without prior degree in economics	5.5	1.0	2.7	2.9	64
With prior master's degree	5.0	1.0	2.4	2.8	157
Without prior master's degree	5.8	0.9	2.3	3.1	201
Started job prior to completion of Ph.D. ^e	6.7	0.9	2.6	4.0	79
Did not start job prior to completion of Ph.D.	5.1	1.0	2.3	2.8	279
<i>Type of undergraduate institution</i>					
Econ Ph.D. granting	6.0	0.9	2.7	3.3	90
Top-50 liberal arts	5.7	1.0	2.3	3.1	31
Other U.S.	5.8	1.0	2.7	3.1	50
UK, Ireland, Canada, Australia, New Zealand	5.3	0.8	1.8	2.9	16
Other European	5.0	1.0	2.3	2.8	23
Other foreign	5.1	1.0	2.2	2.8	92
<i>Graduate program characteristics</i>					
Program rank 1–6	5.2	0.8	2.0	3.0	66
Program rank 7–15	5.3	1.0	2.1	3.1	57
Program rank 16–30	5.1	1.0	2.4	2.5	71
Program rank 31–48	5.1	1.0	2.7	2.4	48
Program rank > 48	6.3	1.0	2.8	3.0	116

^a Sample includes only those with full information on the outcomes listed in each of the columns. Sample size varies by row because of missing information on demographic or other characteristics.

^b The components of time-to-degree listed in the table do not sum to the total time-to-degree because time-to-ABD includes time to complete core exams and because the dissertation completion date can differ from the degree date.

^c Time-to-ABD is defined as the elapsed time from starting the Ph.D. program to latest of the course, core exam, or field exam completion dates.

^d Time-to-write dissertation is defined as the dissertation completion date minus the ABD date.

^e Started current job six or more months prior to completion of the Ph.D.

Source: Authors' survey.

supervisors at tier 1–4 schools than at tier 5 institutions.⁸

At tier 1 and 2 institutions, students complete their coursework and comprehensive exams faster, but take longer to complete their disser-

tations than students at tier 3 and 4 institutions. The median elapsed time-to-degree at tier 5 programs is substantially longer than at tier 1–4 institutions because tier 5 students take longer to attain ABD status and they also take longer to write their dissertations. Table 2 reports the median years to completion of core exams, to ABD status, and to write a dissertation for 15 universities for which we have such data from at least seven 2002 graduates. The average time to complete core exams ranges from eight months at Yale to 17 months at George Mason. Time from matriculation to

⁸ In a study using 200 economics Ph.D. students in the Netherlands, however, Jan C. van Ours and Geert Ridder (2003) find that the faster graduation of students supervised by more active research faculty is a pure selection effect. Controlling for selection, they find the same speed of completion by students of relatively more or less research-active supervisors.

TABLE 2—YEARS TO DEGREE, TO COMPLETE CORE EXAMS, TO ABD, AND TO WRITE DISSERTATION FOR ECONOMICS PH.D. CLASS OF 2001–2002^a

	Median years to				<i>N</i>
	Degree	Core exams	ABD	Write dissertation	
Full Sample	5.5	1.0	2.4	2.9	358
Illinois	4.3	1.3	2.3	1.7	7
George Mason	4.5	1.4	2.7	2.1	8
Cornell	4.8	0.8	2.8	2.0	9
Harvard	4.8	0.8	2.4	2.8	18
MIT	4.8	0.8	1.8	2.9	9
UCLA	4.8	1.0	2.0	2.5	10
NYU	5.0	1.0	2.3	2.3	11
Minnesota	5.0	1.0	2.0	3.4	10
Chicago	5.2	0.8	2.4	2.8	16
Johns Hopkins	5.7	0.9	1.7	3.6	7
Maryland	5.7	1.3	2.7	3.0	11
Stanford	5.8	1.0	2.3	3.3	10
Berkeley	5.8	1.0	2.3	3.8	7
Yale	5.8	0.7	1.8	3.8	8
Wisconsin	5.9	1.3	2.3	2.8	11

^a See notes to Table 1. Only universities with at least seven graduates in the sample are listed individually. Source: Authors' survey.

ABD status ranges from 20 months at Johns Hopkins to 34 months at Cornell. Finally, the median time devoted to writing a dissertation ranges from 20 months at Illinois to 46 months at Berkeley and Yale.

III. Determinants of the Variation in Time-to-Degree

Earlier research suggests that elapsed time-to-degree might be related to fields of prior degrees, whether the graduate took a job prior to completing the degree, type of financial aid received, gender, children, type of undergraduate institution attended, citizenship, age, and whether the graduate entered the Ph.D. program holding a terminal master's degree (Siegfried and Stock, 2001; Ronald G. Ehrenberg and Panagiotis G. Mavros, 1995). We have data sufficient to examine relationships between these characteristics and time-to-degree for the class of 2002. To evaluate relationships between time-to-degree and graduates' marital status, field of study, and whether their dissertations were a single-topic treatise or a set of essays, we estimated a duration model based

on a Weibull distribution.⁹ The variable means, estimated coefficients, *z*-ratios, and predicted change in time-to-degree for those statistically significant (at the 0.05 level using two-tail tests unless otherwise noted) attributes of selected variables are reported in Table 3. The mean time-to-degree for the 298¹⁰ observations used to estimate the duration model is 5.6 years.

Demographic characteristics are largely unrelated to the time required to earn a Ph.D. in economics. Students who were parents when they began the Ph.D. program took no longer than childless matriculants, but those who *first* became parents during their Ph.D. studies experienced a disruption, taking almost a year longer than those who did not become parents. The difference in time-to-degree between new mothers and new fathers is not significant.

Not surprisingly, those who began a job six months or more prior to completing their Ph.D. took about nine months longer to finish than those who either started their job closer to having finished or after graduation. The 247 Ph.D. students who were undergraduate majors in economics took about the same time to complete the Ph.D. as did those who did not major in economics. Although one might expect that the most likely graduates to finish rapidly are ones with bachelor's degrees in technical fields like mathematics, physics, statistics, computer science, or engineering, the 57 Ph.D. students in our sample with technical backgrounds actually took longer than others.¹¹

There are seven or more graduates in the regression sample from 12 different Ph.D. programs: UC-Berkeley, Chicago, Cornell, George

⁹ Estimations using a Cox proportional hazards model yielded qualitatively similar results. We present the Weibull results in the table because they are easier to interpret.

¹⁰ Seventeen observations were dropped because either their time-to-degree or their dissertation writing time (or both) exceeded two standard deviations from the mean. All the outliers had a time-to-degree of more than nine years and all but one had a dissertation writing time of more than four years. Siegfried and Stock (2004) reported results from a similar model estimated with 332 observations from these data. The estimates here differ slightly for three reasons: (a) two late-arriving observations have been added; (b) a set of binary indicators for type of undergraduate institution have been added; and (c) the current sample omits observations that did not report their undergraduate institution.

¹¹ The indicators for *prior economics degree* and *prior technical degree* are not mutually exclusive.

TABLE 3—TIME-TO-DEGREE AND DISSERTATION WRITING TIME, DURATION MODELS

	Mean	Time-to-degree			Dissertation writing time		
		Estimated exponentiated accelerated failure time coefficients	z-ratios	Predicted change in months ^a	Estimated exponentiated accelerated failure time coefficients	z-ratios	Predicted change in months ^a
Time-to-degree (years)	5.63	—	—	—	—	—	—
Dissertation writing time (years)	2.99	—	—	—	—	—	—
<i>Demographic characteristics</i>							
Age at matriculation	26.37	0.995	-2.47	-0.32	0.996	-0.70	
Female	0.28	1.059	1.85		1.074	1.43	
Married at matriculation	0.24	0.941	-1.43		0.906	-1.30	
U.S. citizen	0.53	1.050	0.77		0.971	-0.28	
Had child at matriculation	0.11	1.100	1.29		1.011	0.09	
Female*had child at matriculation	0.03	1.024	0.18		1.053	0.23	
Had child during graduate school	0.12	1.151	3.03	10.2	1.193	2.13	6.9
Female*had child during graduate school	0.02	1.020	0.17		1.031	0.21	
White	0.72	1.002	0.06		1.053	0.98	
Started job prior to completion of Ph.D.	0.19	1.134	4.11	9.1	1.216	4.03	7.7
Prior master's degree	0.41	0.950	-1.70		0.925	-1.44	
Prior economics degree	0.83	1.055	1.30		1.163	2.55	5.8
Prior technical degree ^b	0.19	1.055	1.42		1.076	1.34	
<i>Primary type of financial assistance^c</i>							
Teaching assistant	0.31	—	—		—	—	
Research assistant	0.09	1.033	0.60		0.889	-1.21	
Fellowship	0.07	0.910	-2.49	-6.1	0.934	-0.78	
Government support	0.04	0.954	-0.55		0.661	-2.80	-12.2
Mixed support	0.45	0.943	-1.87		0.925	-1.41	
No support	0.04	1.141	1.92	9.5	0.982	-0.21	
Dissertation set of essays	0.61	0.906	-3.26	-6.4	0.929	-1.51	
<i>Type of undergraduate institution</i>							
Economics Ph.D. granting	0.32	—	—		—	—	
Top-50 liberal arts	0.10	0.820	-2.58	-12.1	0.819	-1.66	
Other U.S.	0.16	0.959	-0.36		1.044	0.21	
UK, Ireland, Canada, Australia, New Zealand	0.05	0.834	-2.45	-11.2	0.767	-1.99	-8.3
Other European	0.09	0.918	-1.25		0.846	-1.46	
Other foreign	0.29	0.928	-1.28		0.895	-1.12	
Economics Ph.D. granting*U.S. citizen	0.29	—	—		—	—	
Top-50 liberal arts*U.S. citizen	0.07	1.076	0.81		1.064	0.36	
Other U.S.*U.S. citizen	0.14	0.946	-0.46		0.840	-0.81	
Foreign*U.S. citizen	0.03	1.109	0.93		1.191	1.07	

Notes: N = 298. Regression also includes constant, binary controls for Ph.D. programs with seven or more graduates in the regression sample (programs are Chicago, Cornell, George Mason, Harvard, MIT, NYU, Stanford, Maryland, Minnesota, Wisconsin, Berkeley, and UCLA), and binary controls for field of specialization.

^a Predicted changes in months reported only for coefficients significant at the 0.05 level (two-tailed tests, except fellowship and no support, for which we used a one-tailed test based on their obvious negative (positive) expected impact on time-to-degree and dissertation writing time).

^b = 1 for those with prior degrees in mathematics, physics, statistics, computer science, or engineering (including double majors with economics).

^c Primary financial assistance is reported for five years of funding. In the dissertation-writing-time regression, we count only funding received during the last two years of study. The means for the variables defined over the last two years of study are 0.29, 0.09, 0.07, 0.02, 0.43, and 0.10, respectively, for teaching assistant, research assistant, fellowship, government support, mixed support, and no support.

Mason, Harvard, Maryland, Minnesota, MIT, NYU, Stanford, Wisconsin, and UCLA. Program indicators show that Cornell, NYU, MIT, and UCLA graduates finished faster than the average of all graduates from institutions other than the 12 that are controlled. Cornell students finished 19 months faster than the benchmark, with MIT, NYU, and UCLA students not far behind at 13, 12, and 12 months faster, respectively. None of the identified universities' Ph.D. students finished slower than the benchmark.

We classified Ph.D.s as receiving predominantly one type of financial aid if it was the sole source of aid for a majority of their first five years in the program. On this criterion, 31 percent received predominantly teaching assistantships, 9 percent received research assistantships, 7 percent received fellowships, 4 percent received government sponsorship (one United States, and 14 foreign), and 4 percent received no financial aid. For 45 percent of the graduates, no single form of financial support predominated. Their support is labeled "mixed." The results indicate fellowship support is associated with completing a degree five months faster than teaching assistant support, which is similar to the findings of Ehrenberg and Mavros (1995). The absence of substantial effects of the other types of financial aid on time-to-degree is surprising, not only because some forms of financial aid provide more time to study, but also because the more attractive types of financial aid are often awarded competitively to students who have greater prospects for finishing quickly, which may be the reason we observe a shorter time-to-degree for those with fellowships.¹² Those without financial aid took about ten months longer to complete their degrees than those on teaching assistantships, although this result is significant only at the 0.11 level.

The dissertation of 61 percent of the graduates consisted of a set of essays rather than a single-topic treatise. After controlling for other included variables, those writing essay-style dissertations finished about six months faster

than others. Although we do not report the estimated coefficients in the table, indicators for *Journal of Economic Literature* fields of specialization were included in the estimation, with micro theory as the benchmark. Only agricultural and natural resource economics graduates finished significantly faster (by 11 months) than those in micro theory. No field's graduates took statistically significantly more time than specialists in micro theory. Finally, among international students, those who earned a bachelor's degree from a top-50 U.S. liberal arts school or a university in the United Kingdom, Ireland, Canada, Australia, or New Zealand finished about a year faster than those who earned their undergraduate degree at a U.S. university offering a Ph.D. in economics. U.S. citizens with undergraduate degrees from either a top-50 liberal arts college, or from some other U.S. college or university that does not offer a Ph.D. in economics, finished about seven and six months faster, respectively, than U.S. citizens with a bachelor's degree from a U.S. university that offers a Ph.D. in economics (p -values on the sum of the coefficients were less than 0.05).¹³

IV. Determinants of the Variation in Dissertation Writing Time

There is more variation across individuals in dissertation writing time than time-to-degree or time-to-ABD status.¹⁴ On average, dissertation writing occupies more than half the total time-to-degree. In order to focus on dissertation writing, we estimate the hazard model using dissertation writing time as the dependent variable. Because dissertation writing normally occurs during the last two years in residence (e.g., years four and five for one who graduates in five years), we redefine the financial assistance variables to identify only the predominant type of financial aid received in the last two years of study. The empirical results are reported in Table 3.

¹² We are collecting data on 586 people who entered economics Ph.D. programs in fall 2002, including the academic credentials on their application. When most of this cohort has earned a degree, it will be possible to estimate the effects of financial aid, holding constant some academic credentials that affect the type of aid they receive.

¹³ Because small numbers require us to aggregate some undergraduate institution categories, we cannot estimate the separate effect of U.S. citizens earning undergraduate degrees at the three foreign-university categories.

¹⁴ The coefficient of variation of dissertation writing time across individuals is 0.65, whereas for time-to-degree it is 0.39, and for time-to-ABD it is 0.42.

Like their relationships to time-to-degree, demographic characteristics are not significant determinants of dissertation writing time. Most of the time lost by having children during graduate school takes place during the dissertation writing stage (seven of ten months), as does the time lost by starting a job prior to completing the degree (eight of nine months). Those with prior degrees in economics take about six months longer to write their dissertations. Their overall time-to-degree does not differ from those with other prior degrees, however, suggesting that they make up at least some of the delay during the coursework phase of their program.

Graduates with predominately government support progress substantially (12 months) faster during the dissertation stage, but must lag during earlier stages of the process because their overall time-to-degree does not differ from those predominately on teaching assistantships. Surprisingly, writing a set of essays rather than a single topic treatise is not associated with shorter dissertation writing time, even though students who elect a set of essays finish about six months faster than those who write a traditional treatise. Finally, among international students, those who earned undergraduate degrees from predominantly English-speaking countries take about eight fewer months to write their dissertation than international students who attended U.S. economics Ph.D.-granting institutions as undergraduates. Among Americans, those who attended an "other U.S." college that does not offer a Ph.D. in economics enjoy a statistically significant advantage in dissertation writing time of four months over those holding a bachelor's degree from a Ph.D.-granting university. The overall time-to-degree advantage of top-50 liberal arts colleges apparently manifests itself in greater speed to completion of coursework and comprehensive examinations, because graduates of top-50 liberal arts colleges do not have a significantly shorter dissertation writing time.

Among the 12 identified universities, Cornell (13 months), George Mason (10 months),¹⁵ and NYU (9 months) have dissertation writing times

statistically significantly shorter than the benchmark; none has times significantly longer than the benchmark. Finally, those writing dissertations on industrial organization have significantly shorter durations for dissertation writing (by eight months) relative to those writing in micro theory.

V. Program-Specific Characteristics and Time-to-Degree

To explore the importance of differences in the structure of various Ph.D. programs, we estimated the hazard models reported in Table 3 for the 116 Ph.D.s who graduated from one of 27 universities for which we have obtained information about program structure as part of a larger project on the Ph.D. production process (Finegan et al., 2006; Stock et al., 2006). We include in the models the number of Ph.D. students enrolled in the program, the ratio of Ph.D. students to the number of graduate faculty (actively engaged in either graduate teaching or dissertation supervision), indicators for whether teaching- or research-assistant students are provided office space, whether Ph.D. students have a departmental location to congregate, whether first-year students must pass one or more written exams before the start of the second year, and whether first- and second-year students are assigned individual faculty advisers (rather than a director of graduate study or general administrator as an advisor).

Only the indicator for whether graduate students are assigned individual faculty advisers is significantly related to time-to-degree, and its coefficient implies an implausible eight-month *longer* time-to-degree for graduates from the programs using that practice. No program characteristic was significantly related to thesis-writing time. To the extent we have captured relevant dimensions, it does not appear that program structure has much impact on time-to-degree.

VI. Summary

Reducing the average time required to earn a Ph.D. in economics by one year would save well over \$60 million annually in opportunity costs alone. If progress is to be made in reducing time-to-degree, it is probably going to occur in dissertation writing, where opportunities to

¹⁵ Faculty at George Mason attribute their graduates' fast dissertation completion to a culture of writing for publication fostered during the second and third years of Ph.D. study.

shorten duration may be found where dissertation writing is unusually slow. Although one might hypothesize that shortening the time-to-degree may reduce learning and subsequent productivity, this does not appear to be the case. The only relevant evidence we know finds that longer times-to-degree are correlated with fewer, not more, publications (David E. Harrington, 2005), after holding constant ability via the tier of each graduate's Ph.D.-granting institution. Similarly, using publications as of 2004 for 583 economics Ph.D. graduates from 1997, we find significantly (at the 0.01 level) fewer publications, whether measured as articles in refereed journals or as articles in top-50 journals, for those who took longer to earn their Ph.D. For each added year of time-to-degree, top-50 publications declined by 0.15 and journal articles declined by 0.36, holding constant the tier from which the economist graduated as a control for "ability."¹⁶

Based on the experience of the class of 2002, economists who complete their degrees quickly tend to be those who do not have children during their studies, finish their degree before starting work, have fellowship support, and write a set of essays rather than a single-topic treatise. Those who attended top-50 liberal arts colleges or "other U.S." colleges as undergraduates rather than a U.S. economics Ph.D.-granting university finished faster. Applicants from those institutions might warrant a closer look by admissions committees because they are less expensive to educate than otherwise equivalent applicants who earned an undergraduate degree at a university that offers a Ph.D. in economics. Differences in the structure of programs do not seem to affect time-to-degree. Increased fellowship support, a shift toward sets-of-essays dissertations, and efforts to discourage candidates from taking a job before completing their degree should all help reduce the time required to earn a Ph.D. in economics.

¹⁶ See Siegfried and Stock (1999) for information on how this sample was obtained. The results also support the hypothesis that those graduating from more highly ranked departments publish more. Because everyone in the sample graduated in 1997, we cannot estimate the role of experience.

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