

The Market for New Ph.D. Economists in 2002

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A period of malaise in the mid-1990s led to a contraction in enrollment at many economics Ph.D. programs. The resulting reduction in the supply of new Ph.D. economists, combined with a smaller contraction in demand for new Ph.D. economists, generated, as the Wall Street Journal reported, a "hot pursuit" for some economics Ph.D.s, with "even low-level candidates [being] treated like big shots" (Jon E. Hilsenrath, 2001, p. B1). As might be expected, the scarcity of new economics Ph.D.s that materialized at the end of the decade appears to have induced more enrollments in economics Ph.D. programs, with annual matriculations rising by about 25 percent between Fall 1998 and Fall 2002 (Charles E. Scott and John J. Siegfried, 1999-2003).

Predictions for the current job market are mixed. On the one hand, demand may expand as some academic departments whose hiring had been constrained by financial exigency return to active recruiting (Jennifer Jacobson, 2003). On the other hand, the aftermath of the recession continues to limit some public university budgets at the same time that the supply of new economics Ph.D.s may start to expand, resulting in a job market for American Ph.D.s that The Economist describes as "bleak" ("Unemployment Forecast," 2003, p. 60).

Five years ago we reported the results of a comprehensive survey of the labor market for economics Ph.D.s graduating in 1996-97 (Siegfried and Wendy A. Stock, 1999). In contrast to other social science and science disciplines, most economists who graduated with a doctorate in 1996-97 found full-time career-tracking jobs that paid well (those in permanent full-time jobs in the U.S. earned an average starting salary of \$61,000). Many of those employed in business and industry, however, were not satisfied with their jobs despite receiving a significant salary premium relative to academics.

Here we report results from a new survey of the class of economics Ph.D.s graduating in 2001-02. This information should be of interest to current and prospective Ph.D. students, of use to advisors of undergraduates considering graduate study in economics, and of assistance to faculty concerned with the employment prospects of applicants they admit to their doctoral programs. For methodological details consult our earlier report (Siegfried and Stock, 1999).

I. The Changing Profile of Graduate Training in Economics

Updated information on economics doctorates from the National Science Foundation's (NSF) Graduate Student Survey, Survey of Earned Doctorates, and Survey of Doctoral Recipients is reported in Table 1. Because we described these data earlier (Siegfried and Stock, 1999, pp. 116-118) here we note only substantial changes since 1996, or the continuation of important trends through 2001.

According to the NSF, the number of economics (and econometrics) Ph.D.s awarded annually by U.S. universities fell from 1,008 in 1996 to 930 in 2001. NSF data also indicate that the median years economics students are registered in graduate programs before earning a Ph.D. has grown from 6.8 in 1996 to 7.0 in 2001. However, because this number includes time spent in *any and all* post-baccalaureate programs (e.g., it includes time spent earning a terminal master's degree in economics, an MBA, or a law degree prior to entering the Ph.D. program), we hesitate to interpret it as the time required to earn a Ph.D. in economics. Based on our sample of graduates (described below), we project the median time between "beginning the Ph.D. program" and "receiving the degree" at 5.4 years for the class of 2001-02, up from 5.3 years (measured similarly) for the class of 1996-97 (Siegfried and Stock, 1999).¹

Although the number of full-time first year graduate students progressively declined from

1992 to 1998, it has risen steadily between 1998 and 2001 (the latest year for which data are available). Thus, using our estimated time-to-degree of 5.4 years, we expect the number of new economics doctorates to end its decline in 2003-04 and then to expand modestly through at least 2006.

The long-term upward trend in the proportion of degree recipients who are female accelerated from 1996 to 2001, rising to 28 percent. The share of all doctorates in economics that are earned by U.S. citizens maintained its decline of a bit more than a percentage point per year over the past quarter century, falling to 38 percent by 2001. As a result, there were only about 350 new economics Ph.D.s awarded to U.S. citizens in 2001, down from 430 in 1996, and now at approximately the annual level awarded during Lyndon Johnson's administration.

Individual universities continue to bear most responsibility for financing graduate economics education, although federal aid recovered modestly in the last five years. When undergraduate economics enrollments fell in the first half of the 1990s, some graduate teaching assistantships evaporated. As undergraduate enrollments have recovered since the 1996 trough (Siegfried, 2003), teaching assistantships for doctoral students have rebounded as well.

The proportion of graduates with postdoctoral employment plans remained steady from 1996 through 2001. Despite continued growth in the proportion of Ph.D. graduates who are not U.S. citizens, the fraction of graduates accepting jobs outside the U.S. declined from 1996 to 2001, perhaps because U.S. employers offered sufficiently high salaries to avoid being rationed out of the tightening market. Adjusting the number of Ph.D. degrees awarded by the proportion who take jobs in the United States indicates that the number of new economics doctorates hired annually by U.S. employers has remained close to 700 over the past quarter century.

II. The 2002-03 Survey

Our primary source of information for this study comes from a survey of individuals who earned a Ph.D. in economics between July 1, 2001 and June 30, 2002. We also obtained from thesis advisors partial information for some of the graduates who did not return the questionnaire. We identify our population from the December 2002 Journal of Economic Literature (JEL), which lists 911 dissertation titles of graduates from 111 U.S. and 12 Canadian Ph.D. programs. Starting with these 911 dissertation titles, subtracting the 47 graduates of Canadian universities and the 52 U.S. degrees we know were awarded by departments other than “standard” economics departments, leaves 812 U.S. economics Ph.D.s awarded in 2001-02. Based on survey responses, we know that at least 84 of these 812 did not earn their degree in the specified time window. If we conservatively assume that the number reported in earlier or later years that, in fact, did earn their degree between July 1, 2001 and June 30, 2002 is roughly equal to the 84 “out of period” graduates who were listed in the December 2002 JEL, and if we allow for several dozen dissertations that might go unreported each year, we judge that about 850 Ph.D.s were awarded in economics by U.S. universities in 2001-02, down 100 from our comparably estimated 950 in 1996-97. NSF’s count declined by 127 from 1997 to 2002. NSF reports 903 economics Ph.D.s for 2001-02.²

We received 398 useable graduate responses.³ Including 121 responses from thesis advisors of graduates who did not return the survey themselves, we have at least partial information for 519 of the roughly 850 economics Ph.D.s we estimate were earned in the U.S. in 2001-02. This 61 percent response rate is substantially higher than most previous efforts (Siegfried and Stock, 1999).

Our respondents obtained their degrees from 99 different U.S. universities. Including the graduates for whom we secured partial information from thesis advisors, the number of institutions represented grows to 101. There are 10 or more graduates in the combined samples from each of 15

different universities, including 25 from Harvard, 20 from California-Berkeley, 19 from MIT, 18 from Chicago, and 16 from NYU. No other institution has more than 15 graduates in the sample.

III. The Sample and Its Representativeness

Summary statistics for responses from the 2001-02 graduates themselves and reports from the thesis advisors of nonrespondents are shown in Table 2. By assuming there is no response bias from the advisor survey correlated with graduates' characteristics, we can project the characteristics identified in Table 2 to the entire estimated population of 850 U.S. economics doctorates in 2001-02, as reported in column 3.

Various sources, including the direct responses to our survey, the Survey of Earned Doctorates, the responses of 79 Ph.D. granting programs to the American Economic Association's (AEA) Universal Academic Questionnaire (UAQ) (Scott and Siegfried, 2003), and data collected by the AEA's Committee on the Status of Women in the Economics Profession (CSWEP) (Joan Haworth, 2003), confirm that the share of new Ph.D.s in economics awarded to women has grown to about 28 percent in 2001-02, up from 25 percent five years earlier. CSWEP reports that for the period 1995-97, the years during which 70 percent of our sample entered graduate school, roughly 31 percent of first-year Ph.D. students were female (Haworth, 2003). The difference between the proportion of new economics Ph.D.s that are female and the lagged number of first-year economics Ph.D. students that are female suggests a slightly higher attrition rate among female than male graduate students. Because the proportion of new economics Ph.D. students who are female averaged over one-third between 1997-98 and 2002-03 (Haworth, 2003; Scott and Siegfried, 2003), the percentage of new Ph.D.s in economics earned by women is likely to rise modestly over the next few years.

As was true of the class of 1996-97, respondents are considerably more likely than nonrespondents to be U.S. citizens. Our projection that only 37 percent of U.S. economics doctorates were awarded to U.S. citizens is consistent with the NSF's documented long steady decline in this fraction. Moreover, as part of a larger project we recently surveyed 27 U.S. economics Ph.D. programs (including 15 of the 20 largest) regarding the characteristics of their first-year Ph.D. students in Fall 2002. U.S. citizens comprise 33 percent of the students in that group. If retention rates for domestic students are less than for foreign students, as seems plausible, the proportion of Ph.D. degrees awarded to U.S. citizens is likely to be in the 31-32 percent range by 2008. In addition, the number of U.S. citizen first-year Ph.D. students at these 27 programs declined an amazing 10 percent from Fall 2002 to Fall 2003, which is particularly surprising in view of the recently bleak domestic job market prospects for U.S. baccalaureate degree holders. Thus, it appears that the downward trend in the percent of U.S. economics Ph.D.s awarded to U.S. citizens will continue unabated for at least five more years, having already plummeted 40 percentage points over the last 40 years.

We find that 76 percent of new U.S. economics Ph.D.s earned bachelor's degrees in economics (including double-majors).⁴ Contrary to common perception, only 14 graduates (4.1 percent) earned bachelor's degrees in mathematics; five percent held bachelor's degrees in engineering. No other undergraduate major accounts for more than four percent of the sample. As was the case in 1996-97, roughly 45 percent of the 2001-02 graduates held a master's degree prior to entering their Ph.D. program. The vast majority of these (76 percent) were in economics; five percent were in public policy. Over 97 percent of the employed graduates of the class of 2001-02 obtained full-time jobs. The advisor responses indicate that nonrespondents are more likely than respondents to hold permanent jobs. Our projection suggests that 59 percent of the 2001-02 cohort

secured jobs in academe.

Respondents were more likely than nonrespondents to have specialized in economic development and health, education, and welfare economics and were less likely to have specialized in macro/monetary economics. As was the case with the class of 1996-97, the largest percentages of economics Ph.D.s specialize in macro/monetary economics and international economics.

IV. Time-to-degree

Based on information from graduates and thesis advisors, we project the median time-to-degree for the class of 2001-02 as 5.4 years. The range extended from 2.7 to an extraordinary 29.7 years. Only 65 graduates completed their degrees within four years. Time-to-degree can be partitioned into a median of 1.0 year to complete first-year or core preliminary examinations, an additional 1.8 years to complete all other non-dissertation requirements, and a further 2.6 years to complete the dissertation. To examine variations in time-to-degree, we estimated a duration model based on a Weibull distribution for the 348 graduates who answered all the questions we included.⁵ The 16 graduates whose time-to-degree was more than two standard deviations from the mean were excluded.⁶ The variables we expected to affect time-to-degree include: particular graduate programs (i.e., dummies for universities with at least seven graduates in the regression sample), type of financial support, type of dissertation, field of specialization, and socio-demographic and educational background characteristics. We report estimated coefficients of the variables that were statistically significantly different from zero at the ten percent significance level (two-tail tests). The *mean* time-to-degree for the regression sample is 5.7 years.

There are at least seven graduates in the regression sample from 13 different universities: California-Berkeley, Chicago, Columbia, Cornell, George Mason, Harvard, Maryland, Minnesota,

MIT, NYU, Stanford, Wisconsin, and UCLA and we included binary indicators for these programs in the regression. Among these 13, relative to all of the others as a benchmark, Ph.D. students at Chicago, Cornell, Harvard, MIT, and NYU graduated significantly faster. Cornell students win the *quick-like-a-bunny* award, finishing an estimated 15 months faster at the mean. No school qualifies for the *slow-like-a-tortoise* award, however, as none was significantly longer than the benchmark.

Fifty-six percent of the graduates wrote a dissertation consisting of a set of essays rather than a single-topic treatise. Holding other things constant, choosing to write a set of essays is estimated to save about 6.5 months in the doctoral production process. The growing popularity of a set of essays as a dissertation clearly has more motivation behind it than simply preparing research for submission to professional journals.

We asked graduates to identify each source of financial aid they received (e.g., teaching assistantship, research assistantship, no-work fellowship, and government sponsorship) for each of the first five years in their Ph.D. program. We then classified them as having received predominately one type of financial aid if that type was their sole source of aid for a majority of their first five years in graduate school. Forty-four percent of graduates in our regression sample received a mixed financial aid package. Thirty-one percent received predominantly teaching assistantships, 9 percent received predominantly research assistantships, 8 percent predominantly fellowships, and 4 percent predominantly government support. Only 4 percent of graduates received no financial aid. In the duration model, there is no difference in time-to-degree for those whose graduate study was financed either predominately by a research assistantship or predominately by a no-work fellowship and the benchmark of those receiving predominantly teaching assistantships. Those with government sponsorship (e.g., U.S. military officers and graduates supported by foreign governments) are predicted to finish 10.6 months faster at the mean than those financing their study

predominately through teaching assistantships. Receiving a mixed support package was estimated to save four months, while receiving no support was estimated to extend the time-to-degree by finished eight months relative to those predominately on teaching assistantships.

No field of study is associated with a significantly different time-to-degree than micro theory (the benchmark). After controlling for other factors, those holding a master's degree were predicted to take about three months less than those without one. Amazingly, no difference in predicted time-to-degree exists between those who held a prior degree in economics when they began their Ph.D. studies and those that started economics doctoral study without this background. Sex, marital status, children, age, and race are also unrelated to time-to-degree. Even when we estimate the effect of children on time-to-degree separately for men and women there is no significant difference in time-to-degree based on children. U.S. citizens were predicted to take about seven months longer to complete their degrees than non-citizens.

V. Employment Outcomes

We asked graduates (and their advisors) about their employment status as of the first week of December 2002. The unemployment rate among recent economics Ph.D.s continues to be low, projected as 2.1 percent for the population of graduates, slightly under the 2.9 percent we reported five years earlier for the class of 1996-97. It is somewhat lower than the 2.7 percent national unemployment rate during the same time period for 25-34 year olds with four or more years of college (source: authors' calculations based on the Current Population Survey). Less than one percent of the sample (only 4 of 508 individuals) were neither working nor looking for work (and thus not in the labor force).

Based on our graduate and advisor responses [and not projecting outcomes for the full

population], 97 percent of those employed from the class of 2001-02 held full-time positions; 82 percent held permanent jobs. Eighty-one percent of the employed held full-time permanent positions; 16 percent were in full-time temporary positions. A third of the 88 graduates in temporary positions held post-doctoral appointments. At just six percent of the full-time appointments, post-docs are less prevalent in economics than in the natural sciences (Siegfried and Stock, 1999). All but five of the 28 post-docs were employed at a university, the list of which includes Chicago, Louisiana State, Michigan, North Carolina State, Princeton, and Yale. No other employer except the National Bureau of Economic Research accounted for more than one post-doc. Almost all of the three percent of the employed in part-time positions worked in academe; this group of academics reports spending an average of 67 percent of their work time teaching (compared to 45 percent of time spent teaching by those in full-time academic jobs), consistent with job descriptions of adjunct faculty.

As was the case with the class of 1996-97, the U.S. government (e.g., the Federal Deposit Insurance Corporation, the Federal Trade Commission, the Center for Disease Control, and the General Accounting Office), hired more graduates than any other employer (21). The Federal Reserve System accounted for an additional 21 graduates' jobs, the International Monetary Fund hired 17, and the World Bank nine.

According to the graduates and their advisors, twenty-three percent of employed new Ph.D.s found jobs outside the U.S., down from 31 percent five years earlier. The largest number of jobs outside the U.S. was located in Canada (13). Ten respondents found work in South Korea, eight in the UK, and six each in Brazil, Taiwan, and Turkey. Nine percent of the employed U.S. citizens accepted employment outside the U.S., which is only slightly higher (and not significantly different from) the six percent who emigrated in 1996-97. In comparison, 67 percent of employed non-U.S.

citizens found employment inside the U.S., significantly higher than the 46 percent who landed domestic jobs in 1996-97. The international mobility of young non-U.S. citizen Ph.D. economists appears to be growing. The most common employment location for graduates continues to be Washington, D.C. (74 jobs), followed by New York State (39), California (39), and Massachusetts (34).

We asked graduates about the allocation of their work time among teaching, research, academic service (e.g., advising, committees), management or administration, consulting, and professional service activities. Averaging across all employment sectors, graduates spend 46 percent of their time on research, 27 percent of their time teaching, 9 percent consulting, 6 percent in professional service, and 4 percent each in academic service and management or administration. This distribution of work activities has changed little since 1996-97. The perception of the Ph.D. as preparation for research is well founded. Of course, the percentage of time spent in various activities differs across employment sectors. Those in international organizations, business/industry, government and government organizations (e.g., the Federal Reserve), and research organizations spend the bulk of their time in research, professional service, management, and economic consulting, while those at 4-year colleges and universities spend an average of 47 percent of their time in research and 43 percent of it teaching.

Graduates' perceptions of job satisfaction differ based on the percentage of time they spend in these various activities. In response to the question "How do you feel about your job?" 55 percent said they like it very much, 39 percent said they like it fairly well, and 6 percent said they dislike it or dislike it somewhat. Those 6 percent who stated that they dislike their jobs at least somewhat spend an average of 44 percent of their time teaching and 30 percent in research. Those who stated that they like their job very much spend an average of 25 percent of their time teaching and 50

percent of their time in research. The 37 percent of employed graduates who strongly agreed with the statement “This position is similar to what I expected to be doing when I began my Ph.D. program” spend an average of 31 percent of their time teaching and 51 percent of their time in research. The eight percent who strongly disagreed with the statement spend an average of only 19 percent of their time teaching and only 28 percent in research (most of the rest of their time is spent consulting or in professional service activities, which apparently was not anticipated). A little more than five out of six respondents (86 percent) reported that had they known then what they know now, they still would have enrolled in a Ph.D. program in economics.

VI. Salaries

Nominal salaries for employed respondents who held a full-time (*permanent or temporary*) job in the United States are reported in Table 3. The median is \$74,000, up from \$54,000 five years earlier, a compounded annual increase of 6.5 percent (Siegfried and Stock, 1999). The mean annual *starting* salary for those in full-time permanent jobs is \$82,100, significantly higher than the \$61,000 earned in such jobs by the 1996-97 cohort and almost \$3,200 more than the average 2002-03 salary of *full professors* of economics in institutions at which the B.A. is the highest degree offered in economics (Scott and Siegfried, 2003). For those in higher education, the mean nine-month academic-year salary for the class of 2001-02 exceeds the average 2002-03 academic year salaries of assistant professors at Ph.D. granting universities by more than a thousand dollars. The gap at M.A. and B.A. institutions is, of course, much larger. The evidence suggests that salary compression has progressed to within-rank salary inversion.

The median salary for all permanent full-time appointments is 60 percent higher than for all temporary full-time jobs. This premium was only 27 percent five years earlier, indicating rapidly

growing competition for job candidates to fill permanent full-time appointments complemented with an underclass reserve-army of temporary full-time employees (e.g., visiting teaching faculty in academe). For those with permanent jobs, the 38 percent premium paid by business/industry relative to academe has stayed close to its level of five years earlier.

As we did for the class of 1996-97, we conducted a rudimentary cross-section regression analysis of the natural logarithm of salary in order to identify independent correlations between various job characteristics and compensation. Our sample of 190 observations is limited to 2001-02 doctorates in economics employed in the U.S. in full-time permanent positions commencing no earlier than January 2001, thereby omitting from the analysis those graduates who clearly had settled into permanent employment prior to the 2001-02 job market. Academic year salaries were not inflated to match the calendar year salaries of others, on the grounds that most assistant professors work during the summer whether they are compensated or not. Many first and second year assistant professors receive summer compensation as part of a recruitment package. We did not include such supplemental compensation because presumably it is temporary. We analyzed base salaries only, as a more accurate reflection of net present values of lifetime income flows. We did not ask graduates or their advisors about fringe benefits because their responses would be too difficult to quantify comparably across individuals. For the regression analysis, salaries were adjusted for cost of living differentials at the job location relative to Washington, DC. The adjustments used the fourth quarter 2002 American Chamber of Commerce Researchers Association cost-of-living index, available at www.accra.org.

The regression controls for sex, age, marital status, dependents, race, and indicators of the citizenship and native language of the graduates. It also includes time-to-degree and indicators for whether the graduates held a master's degree when entering the Ph.D. program and whether they

held a prior degree in economics upon matriculation. Also included are indicators for individual Ph.D. programs having seven or more graduates in the regression sample, for the sub-field of economics in which graduates specialized, for the employment sector of their job, for the type of institution at which academics were employed (indicators for Carnegie BA/BS institutions, MA/MS institutions, and two-year institutions; doctoral institutions are the benchmark),⁷ and for whether an academic appointment is in a business school. The regression accounts for 38 percent of the variation in the natural logarithm of salaries (adjusted R-squared is 23 percent). Unless noted otherwise, all relationships described here are statistically significant at the five percent level or better (two-tailed tests).

The regression reveals no significant difference in starting salary based on race, age, sex, marital status, citizenship, native language, or whether the graduates had children at the time they completed their Ph.D. Prior master's degrees or prior degrees in economics are also unrelated to starting salaries. Although one might speculate that starting salaries would be different for those graduates whose partner's job opportunities were important in the decision to take their job, a separate regression for the 126 graduates who rated the importance of their partner's job opportunities revealed no such relationship.

Binary variables for universities that graduated at least seven doctorates (California-Berkeley, Chicago, Harvard, MIT, Stanford, and Wisconsin) indicate no difference in starting salary for graduates of any particular institution. When National Research Council (NRC) rank of the program where graduates earned their Ph.D. is substituted for the individual program indicators, the estimated coefficient indicates that graduates of more highly ranked programs earn more (about five percent more for each 20 rank improvement) (Marvin Goldberger et al., 1995). Binary variables denoting "tiers" suggest that the effect is primarily due to lower earnings of graduates from

institutions ranked below 48 by the National Research Council. Graduates who specialize in public economics were predicted to earn 25 percent less than the benchmark, graduates in micro theory. No other field has starting salaries that differ significantly from micro theory.

The regression estimates a salary penalty of 27 percent for academics working in master's level institutions relative to the benchmark of institutions where a doctorate is the highest degree awarded, but no significant penalty for those taking jobs in BA/BS schools. As with the 1996-97 cohort, academics working in a business school were predicted to earn more (26 percent more) than those in other administrative units. Once we control for the other factors in our regression, those working at international organizations (e.g., World Bank, IMF) earn a 23 percent premium and those working in research organizations incur a 20 percent shortfall in estimated salary relative to academics at doctorate-level institutions.

VII. Differences by Employment Sector

Demographic characteristics, employment outcomes, and responses to attitudinal questions are compared across employment sectors in Table 4. A distinct pattern is evident — those employed in business/industry are different from the other graduates. They earn more than their colleagues employed in most other sectors (although in the salary regression their salaries are not significantly different from academics at doctoral institutions), but they are less satisfied with their jobs. They view their jobs as less closely related to economics, less well connected to their education and training, and not what they expected to be doing upon graduation. Only 69 percent of them would have sought an economics doctorate if they had known at matriculation what they know after graduation. In view of their general level of dissatisfaction, it is surprising that those employed in permanent full-time jobs in business/industry are not much more likely to be seeking a new

position than those in comparable jobs in other sectors. Perhaps their higher salaries are, at least in part, a compensating differential. Academics, on the other hand, earn lower salaries than those in other sectors, but view their jobs as more related to economics, more commensurate with their training, and more like what they expected to be doing when they began their Ph.D. study.

VIII. Differences by Ph.D. Program Rank

Because no new NRC rankings of quality of graduate programs have appeared since 1996-97, we grouped graduate programs into the same five "tiers" used in our earlier study (Goldberger et al., 1995). The first tier consists of Chicago, Harvard, MIT, Princeton, Stanford, and Yale. The second tier is California-Berkeley, Columbia, Michigan, Minnesota, Northwestern, Pennsylvania, Rochester, UCLA, and Wisconsin. The third tier is the 15 programs ranked 16-30, the fourth tier programs ranked 31-48, and the fifth tier includes the remainder of the programs (we include here programs that were not ranked by the NRC because they did not reach the threshold for number of Ph.D.s awarded in the 1993 ranking but who otherwise would rank in Tier 5).⁸ Differences across the tiers in demographic characteristics, employment outcomes, and graduates' attitudes about their jobs are reported in Table 5. A final column contains the results of ordinary least squares regressions of each row variable on the rank of the program conferring the doctorate. Fourteen of the 23 estimated coefficients are statistically significant at the 0.05 level, indicating the importance of disaggregating by program rank.

As they did five years earlier, the elite programs continue to enroll younger students and a higher proportion of non-U.S. citizens. Larger fractions of students from the top-tier programs wrote dissertations consisting of a set of essays rather than a single-topic treatise. Larger fractions of these graduates also had predominately no-work fellowship support, while a smaller fraction of them had

predominately teaching assistant or government support; the opposite is true for those from Tier 5 institutions. Larger fractions of the top-tier graduates landed a full-time permanent job and both academic and non-academic salaries fall with rank of Ph.D. granting program.

Graduates of first tier universities report the best fit with their job. They agree more frequently that their job is related to economics and is commensurate with their education. Nevertheless, there is little difference across program rank in whether graduates believe they still would have enrolled in an economics Ph.D. program if they had known when they matriculated what they knew about a year after they graduated.

IX. Differences by Economics Subfield

Demographic characteristics and employment outcomes are reported by economics subfield in Table 6. The high fraction of women in labor economics persists, with economic development, and health, education, and welfare economics also becoming popular among female economists. Women show little interest in financial economics. Non-citizens predominate in micro theory, macro/monetary, and international economics, while U.S. citizens dominate in labor economics and agricultural/natural resource economics. Dissertations are more likely to consist of a set of essays in international economics and macro/monetary economics; they are more likely to be a single-topic treatise for those graduating in public economics and economic development.

There is no significant difference among the fields in the proportion of graduates who secure academic appointments. Labor economists seem to have the greatest difficulty securing full-time permanent jobs, industrial organization economists the least difficulty. Among U.S. academics, financial economists and industrial organization economists are more frequently located in business schools, while the opposite is true for those specializing in labor economics, economic development,

or health, education, and welfare economics.

There is almost no difference in salaries among the fields of specialization for non-academics, the exception being international economists earn more than those in other fields. This may be related to the high salaries paid by the IMF and World Bank. Within academe, financial economists and industrial organization economists are paid the most, public economists the least. The former is related in part to the salary premium paid for economists employed by business schools. Indeed, once we controlled for this and other factors in the salary regression, except for the discount for public economics, all differences in salaries among the fields disappeared.

X. Conclusion

There were about 850 new Ph.D.s awarded in economics in 2001-02. The proportion of new economists who are female continues to rise, and the fraction of new economics doctorates awarded to U.S. citizens continues its forty-year slide of about a percentage point per year. Only three out of every eight new economics Ph.D.s awarded by U.S. universities in 2001-02 went to a U.S. citizen.

Like many things, the state of the market for new Ph.D. economists is a matter of perspective. Unemployment is low and mean salaries for those with permanent full-time jobs have increased a remarkable 35 percent over the past five years. Eighty-one percent of the employed graduates manage to secure a permanent full-time job within a year of graduation, as was the case five years earlier. If colleges and universities are shifting from tenure-track (here called permanent) appointments to visitors and adjuncts, they do not seem to be doing it in their economics departments; 76 percent of new Ph.D. economists employed by four-year colleges and universities have full-time permanent jobs, up from 70 percent five years earlier. On the other hand, the salary gap between those with permanent full-time appointments and those in temporary jobs is

approaching a chasm; the \$11,800 gap that existed among graduates of the class of 1996-97 has widened to \$30,000 for those graduating in 2001-02. Even among those in permanent positions, one in eight was sufficiently dissatisfied to be actively seeking a new job. If one adds the unemployed and those in temporary positions to this group, about one in four 2001-02 graduates was actively looking for work in early 2003. Among those with permanent positions who are seeking a new job, 15 percent are looking for positions outside of economics.

Graduates' responses to open ended questions in our survey reflect these different perspectives on the economics job market. Comments ranged from "Markets work!!!" to "it's a jungle out there," "2002 was the worst – or so I thought until 2003," and "The job market was a good experience—but it is even better when it is over!"⁹ Not surprisingly, comments from graduates in temporary jobs tended to be more negative and their job satisfaction tended to be lower than those in permanent jobs. On the bright side, however, the vast majority of both groups agreed that having known then what they know now, they still would have pursued a Ph.D. in economics.

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FOOTNOTES

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¹ Over half (51 percent) of our sample earned a prior graduate degree before enrolling in their economics Ph.D. program. Most of these were from economics MA/MS programs. Since James McCoy and Martin Milkman (1995) estimate that the number of months typically taken by full-time students to graduate from economics MA/MS programs is 20 months, the NSF data and our sample responses would agree that, on average, the economics Ph.D. process took about 5.4 years for 2001-02 graduates.

² The reason for the different totals is probably related to the method of classifying Ph.D.s into fields. The NSF asks individual graduates to classify their *dissertation* into an academic discipline. The JEL, in contrast, collects its list of graduates from departments, which may use criteria other than the content of the dissertation to judge whether a graduate is “in economics.” The fact that NSF recorded 21 economics Ph.D.s awarded in 2001-02 by institutions that did not offer a Ph.D. in economics illustrates the problem. How many may be

similarly over-reported to NSF by graduates at institutions that do offer a Ph.D. in economics cannot be determined.

³ We could not locate a valid address for 126 of the 911 graduates listed in the JEL. One graduate died. Of the remaining 784, 37 graduated from Canadian universities, 84 (U.S.) reported (or their advisor reported) that they did not earn their degree during the period, and 52 (U.S.) earned their degrees from a department of agricultural economics, mineral economics, human resources and family studies, or another “non-economics” department, leaving a net of 611 possible U.S. economics respondents. We received 398 graduate surveys, 65 percent of the 611.

⁴ NSF data in Table 1 indicate only 57 percent of 2000-01 economics Ph.D.s majored in economics as undergraduates. If all double-majors in our data are assigned to the non-economics undergraduate major, our proportion declines to 61 percent, reasonably close to the NSF figure. We do not know how NSF handled double-majors.

⁵ Estimation using a Cox proportional hazards model yielded qualitatively similar results.

⁶ All 16 of the outliers had a time-to-degree of more than 10 years.

⁷ The Carnegie Foundation for the Advancement of Teaching categorizes all colleges and universities in the United States. The classification system adopted in 2000 includes: doctoral/research institutions (84 of the 114 graduates in the regression sample employed in academe were employed in these institutions), master’s colleges and universities (19), baccalaureate colleges (9), and associate’s colleges (2). See <http://www.carnegiefoundation.org> for details.

⁸ Carnegie-Mellon also fell short of the threshold for number of Ph.D.s awarded to be ranked by NRC; we placed it in Tier 3 based on Pantelis Kalaitzidakis, et al. (2001).

⁹ A few other open ended comments are interesting: (1) I don’t make as much money as I want...I don’t know how long I can tolerate that; (2) Our society has no respect for knowledge; (3)

Too many graduates, too few positions. You would assume that the profession would have some understanding of supply/demand in the labor market and would begin to self-restrict the supply; (4) Professors who reach retirement age should retire; and (5) It would be nice to have a universal test like lawyers and accountants so one could prove their value despite going to a lesser school.

Table 1 - A Profile of Doctoral Training in Economics in the U.S.: 1977, 1986/87, 1996, and 2001

| | <i>1985-86</i> | | | |
|---|----------------|---------------------|----------------|----------------|
| | <i>or</i> | | | |
| | <i>1976-77</i> | <i>1986-87</i> | <i>1995-96</i> | <i>2000-01</i> |
| Number of doctorates awarded in economics and econometrics | 838 | 861 ^a | 1008 | 930 |
| Percent U.S. citizens | 67.3 | 55.7 ^a | 42.9 | 38.0 |
| Percent female | 8.7 | 19.3 ^a | 22.4 | 28.0 |
| Percent with BA/BS degree in economics | 63.6 | 59.7 ^a | 57.8 | 56.6 |
| Number of full-time first-year graduate students (incl. master's) | 2,886 | 2,584 ^a | 2,466 | 2,562 |
| Number of full- and part-time graduate students (incl. master's) | 12,063 | 12,830 ^a | 12,080 | 11,340 |
| Number of full-time graduate students in economics (incl. master's) at doctoral institutions | 9,938 | 10,473 ^b | 10,991 | 10,755 |
| Median years to Ph.D. | 5.7 | 6.3 ^a | 6.8 | 7.0 |
| Type of support for full-time graduate students at doctoral institutions (percentage distribution) ^c | | | | |
| Fellowship and traineeship | 18.4 | 15.3 ^a | 18.8 | 19.4 |
| Research assistant | 14.5 | 11.9 ^a | 11.3 | 13.3 |
| Teaching assistant | 25.6 | 30.9 ^a | 28.9 | 31.5 |
| Other | 41.5 | 41.9 ^a | 41.0 | 35.8 |
| Source of support (percentage distribution) | | | | |
| Federal | 7.4 | 3.1 ^a | 4.1 | 4.6 |
| Institutional | 44.9 | 52.4 ^a | 52.9 | 59.6 |
| Other | 11.5 | 9.4 ^a | 7.8 | 6.8 |
| Self | 36.2 | 35.1 ^a | 35.2 | 28.9 |
| Postdoctoral plans of new Ph.D.s (percentage distribution) ^c | | | | |
| Employment | 90.5 | 85.4 ^b | 82.9 | 82.9 |
| Postdoctoral study | 3.9 | 6.0 ^b | 9.3 | 8.4 |
| Postdoctoral status unknown | 5.6 | 8.6 ^b | 7.8 | 8.7 |
| Percent accepting employment outside U.S. | 16.2 | 19.6 ^b | 30.3 | 26.2 |

Sources: W. Lee Hansen (1991, Tables 1 and 2) and the NSF WebCASPAR database system.

^a 1985-86

^b 1986-87

^c Distributions do not always sum to 100 percent because some categories are not reported.

Table 2 - Characteristics of 2001-02 Economics Ph.D. Graduates by Response Source, with Population Projections

| | <i>Graduate responses</i> <i>(n = 398)^a</i> | <i>Advisor responses</i> <i>(n = 121)</i> | <i>Population projections^b</i> <i>(based on n = 850)</i> |
|--|---|--|--|
| Percent female | 28.3 | 27.7 | 28.0 |
| Percent U.S. citizen | 48.5 | 26.3 | 36.7 |
| Percent white | 70.1 | - | - |
| Median age at degree | 31.0 | - | - |
| Percent with bachelor's degree in economics | 75.9 | - | - |
| Percent with prior master's degree | 44.5 | - | - |
| Median time to degree | 5.7 | 5.2 | 5.4 |
| Percent unemployed | 1.5 | 2.7 | 2.1 |
| Percent of employed with full-time job | 96.6 | 98.1 | 97.4 |
| Percent of employed with permanent ^c job | 80.6 | 88.0 | 84.5 |
| Percent of employed with job in U.S. | 82.3 | 58.7 | 69.7 |
| Distribution by employment sector (percentage): ^d | | | |
| Percent of employed in higher education | 60.7 | 57.1 | 58.8 |
| Percent of employed in business/industry | 10.3 | 7.6 | 8.9 |
| Percent of employed in government | 15.8 | 19.1 | 17.6 |
| Distribution by field (percentage): ^{d,e} | | | |
| Quantitative | 6.3 | 5.0 | 5.6 |
| Micro Theory | 5.3 | 4.2 | 4.7 |
| Macro/Monetary | 13.1 | 20.0 | 16.8 |
| International | 11.3 | 14.2 | 12.8 |
| Financial Economics | 9.3 | 12.5 | 11.0 |
| Public Economics | 6.5 | 7.5 | 7.0 |
| Health, Education, and Welfare | 6.8 | 2.5 | 4.5 |
| Labor Economics | 10.3 | 9.2 | 9.7 |
| Industrial Organization | 12.1 | 12.5 | 12.3 |
| Development | 7.0 | 1.7 | 4.2 |
| Ag/Natural Resources | 3.5 | 3.3 | 3.4 |

Source: Authors' survey.

^a Sample size varies by row, reported *n* is maximum. All reported data are based on at least five observations.

^b Projections = .468 (graduates' response) + .532 (advisors' response) [.468 = 398/850]; 850 is estimated population of 2001-02 U.S. Ph.D.s in economics.

^c Permanent means the job has no specific termination date. Untenured faculty are in permanent jobs if they are on a tenure track.

^d Distributions do not always sum to 100 because some categories are not reported.

^e Field is the single subfield of economics identified by respondents as their specialization.

Table 3 - New Ph.D. Economists' Annual Salaries for Full-Time Jobs in the U.S., 2002

| | <i>Median</i> | <i>Mean</i> | <i>Low</i> | <i>High</i> | <i>N</i> |
|--------------------------------|---------------|-------------|------------|-------------|----------|
| All full-time jobs in the U.S. | \$74,000 | \$76,500 | \$29,000 | \$300,000 | 298 |
| Permanent positions | 77,500 | 82,100 | 40,000 | 300,000 | 238 |
| Academic | 68,500 | 75,100 | 40,000 | 171,000 | 136 |
| 9-10 month | 67,000 | 71,100 | 40,000 | 142,000 | 112 |
| 11-12 month | 77,500 | 91,300 | 48,000 | 171,000 | 24 |
| Business/Industry | 94,500 | 97,000 | 57,000 | 300,000 | 35 |
| Government | 90,000 | 82,300 | 47,000 | 103,000 | 39 |
| Research organizations | 83,500 | 82,500 | 50,000 | 110,000 | 11 |
| International organizations | 106,000 | 109,700 | 78,000 | 135,000 | 13 |
| Temporary positions | 48,500 | 54,100 | 29,000 | 145,000 | 60 |
| Academic: 9-10 month | 45,500 | 53,900 | 30,000 | 145,000 | 22 |
| Postdoctoral appointment | 45,000 | 44,200 | 29,000 | 65,000 | 22 |

Source: Authors' survey. See notes to Table 2.

Table 4 - Comparisons Among Employment Sectors

| | <i>4-year College/Univ. (n = 292)</i> | <i>Business/ Industry (n = 48)</i> | <i>Research Organization (n = 21)</i> | <i>Government (n = 81)</i> | <i>International Organization (n = 34)</i> |
|--|---|--|---|--------------------------------|--|
| <i>Background Characteristics</i> | | | | | |
| Female ^a | 0.26 | 0.25 | 0.29 | 0.30 | 0.29 |
| U.S. citizen ^a | 0.45 | 0.47 | 0.67 ^{>c} | 0.46 | 0.15 ^{<} |
| English native language ^a | 0.54 | 0.58 | 0.68 | 0.45 | 0.18 ^{<} |
| Married at end of program ^a | 0.53 | 0.48 | 0.68 | 0.57 | 0.41 |
| Had children at end of program ^a | 0.45 | 0.21 ^{<} | 0.21 | 0.48 | 0.32 |
| <i>Employment Outcomes</i> | | | | | |
| Full-time permanent job ^a | 0.76 ^{<} | 1.00 ^{>} | 0.76 | 0.95 ^{>} | 0.70 ^{<} |
| Median salary full-time permanent working in the U.S. (\$) | 68,500 ^{<} | 94,500 ^{>} | 83,500 | 90,000 | 106,000 |
| Permanent job and looking for a new job ^a | 0.11 | 0.13 | 0.18 | 0.11 | 0.05 |
| <i>Attitudes</i> | | | | | |
| <i>(5 = strongly agree; 1 = strongly disagree); mean is reported</i> | | | | | |
| Position is related to my field | 4.56 ^{>} | 3.55 ^{<} | 4.39 | 4.23 | 4.55 |
| Position is commensurate with my education and training | 4.36 ^{>} | 3.93 ^{<} | 4.33 | 4.03 ^{<} | 4.14 |
| Position is what I expected to be doing when I began my Ph.D. | 3.89 ^{>} | 2.83 ^{<} | 3.50 | 3.57 | 3.95 |
| How do you feel about your job? <i>(4 = like it very much; 1 = dislike it)</i> | 3.48 | 3.33 ^{<} | 3.68 | 3.48 | 3.76 ^{>} |
| Had Known? ^b | 0.87 | 0.69 ^{<} | 0.89 | 0.90 | 0.86 |

Source: Authors' survey. See notes to Table 2.

^a Proportions.

^b Proportion with positive response to: "Had you known then what you know now, would you still have enrolled in a Ph.D. program in economics?"

^c ">" ("[<]") = value is significantly higher (lower) than the mean for the rest of the sample at the 0.05 level (one-tailed tests). For variables for which we report the median, we tested for differences in the mean of the variable among the groups.

Table 5 - Comparisons Among Ph.D. Programs by Program Rank

| | Program Rank | | | | | All graduates (n = 519) | Regression coefficient of row variable on program rank ^b |
|---|------------------------|----------------------|----------------------|------------------------|-------------------------------|----------------------------|--|
| | 1-6 (n = 93) | 7-15 (n = 78) | 16-30 (n = 101) | 31-48 (n = 68) | >48 ^a (n = 179) | | |
| Background Characteristics | | | | | | | |
| Median time to degree | 5.00 ^d | 5.42 | 5.08 | 5.25 | 6.00 ^{>} | 5.49 | 0.012 |
| Female ^c | 0.26 | 0.26 | 0.24 | 0.35 | 0.30 | 0.28 | 0.000 |
| U.S. citizen ^c | 0.33 ^{<} | 0.47 | 0.45 | 0.49 | 0.44 | 0.43 | 0.000 |
| English native language ^c | 0.46 | 0.51 | 0.47 | 0.54 | 0.57 | 0.52 | 0.001 |
| Married at end of program ^c | 0.44 ^{<} | 0.49 | 0.64 ^{>} | 0.58 | 0.53 | 0.53 | 0.001 |
| Had children at end of program ^c | 0.18 | 0.20 | 0.23 | 0.21 | 0.34 ^{>} | 0.25 | 0.002 |
| Median age at degree | 30.3 ^{<} | 30.7 ^{<} | 30.7 ^{<} | 31.2 ^{>} | 33.1 ^{>} | 31.0 | 0.067 |
| Program Characteristics | | | | | | | |
| Predominately teaching assistantship support ^c | 0.08 ^{<} | 0.24 | 0.47 ^{>} | 0.38 | 0.38 ^{>} | 0.32 | 0.003 |
| Predominately research assistantship support ^c | 0.03 ^{<} | 0.07 | 0.08 | 0.13 | 0.13 ^{>} | 0.09 | 0.001 |
| Predominately fellowship support ^c | 0.15 ^{>} | 0.14 ^{>} | 0.05 | 0.06 | 0.04 ^{<} | 0.08 | -0.001 |
| Predominately government sponsorship ^c | 0.01 | 0.03 | 0.05 | 0.02 | 0.05 | 0.04 | 0.001 |
| Dissertation set of essays ^e | 0.71 ^{>} | 0.78 ^{>} | 0.60 | 0.59 | 0.36 ^{<} | 0.56 | -0.006 |
| Employment Outcomes | | | | | | | |
| Employed ^c | 0.99 | 0.99 | 0.96 | 1.00 | 0.96 | 0.97 | 0.000 |
| Proportion of employed with academic job | 0.55 | 0.57 | 0.52 | 0.61 | 0.56 | 0.56 | 0.000 |
| Proportion of employed with full-time permanent job | 0.89 ^{>} | 0.86 | 0.86 | 0.85 | 0.70 ^{<} | 0.81 | -0.002 |
| Median salary full-time permanent academic working in U.S. (\$) | 82,000 ^{>} | 74,000 | 72,000 | 64,000 ^{<} | 60,000 ^{<} | 68,500 | -515 |
| Median salary full-time permanent non-academic working in U.S. (\$) | 98,000 | 93,100 | 95,000 | 87,500 | 75,000 | 90,000 | -305 |
| Permanent job and looking for a new job ^c | 0.08 | 0.08 | 0.14 | 0.09 | 0.17 ^{>} | 0.12 | 0.001 |
| Attitudes | | | | | | | |
| <i>(5 = strongly agree; 1 = strongly disagree); mean is reported</i> | | | | | | | |
| Position is related to my field | 4.61 ^{>} | 4.42 | 4.32 | 4.33 | 4.28 | 4.38 | -0.004 |
| Position is commensurate with my education and training | 4.51 ^{>} | 4.43 ^{>} | 4.11 | 4.33 | 4.01 ^{<} | 4.24 | -0.007 |
| Position is what I expected to be doing when I began my Ph.D. | 3.93 | 3.68 | 3.58 | 3.71 | 3.65 | 3.70 | -0.003 |
| How do you feel about your job? <i>(4 = like it very much; 1 = dislike it)</i> | 3.57 | 3.62 ^{<} | 3.43 | 3.53 | 3.37 ^{>} | 3.48 | -0.003 |
| Had known? ^f | 0.86 | 0.87 | 0.85 | 0.90 | 0.85 | 0.86 | 0.001 |

Source: Authors' Surveys. See notes to Table 2.

^a Graduates from unranked institutions are included.

^b Numbers in bold are statistically significant at 0.05 two-tail test level.

^c Proportions.

^d ">" ("[<]") = value is significantly higher (lower) than the mean for the rest of the sample at the 0.05 level (one-tailed test). For variables for which we report the median, we tested for differences in the mean of the variable among the groups.

^e Proportion whose dissertation is best described as a set of essays, rather than a single topic treatise or some other format.

^f Proportion with positive response to, "Had you known then what you know now, would you still have enrolled in a Ph.D. program in economics?"

Table 6 - Comparisons Among Fields

| | <i>n</i> | <i>Female</i> ^a | <i>U.S. citizen</i> ^a | <i>Dissertation set of essays</i> ^b | <i>Proportion of employed with academic job</i> | <i>Proportion of employed with full-time permanent job</i> | <i>Proportion of U.S. academics employed in business schools</i> | <i>Permanent job and looking for a new job</i> ^a | <i>Had known?</i> ^c | <i>Median salary full-time permanent academics working in the U.S. (\$)</i> | <i>Median salary full-time permanent non-academics working in U.S. (\$)</i> |
|----------------------------|----------|----------------------------|----------------------------------|--|---|--|--|---|--------------------------------|---|---|
| Micro | 26 | 0.19 | 0.23 ^{<d} | 0.64 | 0.56 | 0.88 | 0.25 | 0.18 | 0.95 | 71,000 | 92,000 |
| Macro/Monetary | 76 | 0.21 | 0.28 ^{<} | 0.69 ^{>} | 0.53 | 0.83 | 0.42 | 0.07 | 0.86 | 60,000 | 92,000 |
| Quantitative | 31 | 0.26 | 0.32 | 0.65 | 0.53 | 0.70 | 0.13 | 0.09 | 0.76 | 68,000 | ^e |
| Industrial Organization | 63 | 0.29 | 0.52 | 0.52 | 0.58 | 0.92 ^{>} | 0.71 ^{>} | 0.13 | 0.83 | 96,500 ^{>} | 92,000 |
| International | 62 | 0.27 | 0.16 ^{<} | 0.66 ^{>} | 0.55 | 0.78 | 0.46 | 0.10 | 0.90 | 67,000 | 94,500 ^{>} |
| Financial Economics | 52 | 0.16 ^{<} | 0.50 | 0.58 | 0.45 | 0.86 | 0.80 ^{>} | 0.15 | 0.84 | 112,000 ^{>} | 91,500 |
| Labor Economics | 52 | 0.40 ^{>} | 0.56 ^{>} | 0.54 | 0.57 | 0.61 ^{<} | 0.09 ^{<} | 0.10 | 0.85 | 67,000 | 89,500 |
| Public Economics | 35 | 0.23 | 0.54 | 0.40 ^{<} | 0.58 | 0.76 | 0.57 | 0.12 | 0.80 | 58,000 ^{<} | 90,000 |
| Health, Educ., and Welfare | 30 | 0.47 ^{>} | 0.50 | 0.50 | 0.57 | 0.83 | 0.07 ^{<} | 0.16 | 0.84 | 64,000 | 83,500 |
| Development | 30 | 0.43 ^{>} | 0.50 | 0.34 ^{<} | 0.63 | 0.85 | 0.17 ^{<} | 0.13 | 0.88 | 70,500 | 95,000 |
| Ag./Natural Res. Economics | 18 | 0.28 | 0.67 ^{>} | 0.50 | 0.53 | 0.88 | 0.50 | 0.20 | 0.93 | 64,500 | ^e |
| Economic History | 13 | 0.23 | 0.92 | 0.23 | 0.85 | 1.00 | 0.50 | 0.08 | 1.00 | 53,300 | ^e |

Source: Authors' survey. See notes to Table 2.

^a Proportions.

^b Proportion whose dissertation is best described as a set of essays, rather than a single topic treatise or some other format.

^c Proportion with positive response to: "Had you known then what you know now, would you still have enrolled in a Ph.D. program in economics?"

^d ">" ("[<]") = value is significantly higher (lower) than the mean for the rest of the sample at the 0.05 level (one-tailed test). For variables for which we report the median, we tested for differences in the mean of the variable among the groups.

^e Too few observations to report.