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To cite this article: R. Kim Craft & Joe G. Baker (2003) Do Economists Make Better Lawyers? Undergraduate Degree Field and Lawyer Earnings, The Journal of Economic Education, 34:3, 263-281, DOI: [10.1080/00220480309595220](https://doi.org/10.1080/00220480309595220)

To link to this article: <http://dx.doi.org/10.1080/00220480309595220>



Published online: 25 Mar 2010.



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WILLIAM WALSTAD, Section Editor

Do Economists Make Better Lawyers? Undergraduate Degree Field and Lawyer Earnings

R. Kim Craft and Joe G. Baker

Abstract: Using nationally representative data, the authors examine the effects of preprofessional education on the earnings of lawyers. They specify and estimate a statistical earnings function on the basis of well-established theory and principles. Along with standard control variables, categorical variables are included to represent graduate degrees in addition to the law degree and an assortment of undergraduate major fields. Holding a Ph.D. or M.B.A. degree, with the law degree, is associated with significantly higher earnings in some sectors. Lawyers with undergraduate training in economics earn more than other lawyers, *ceteris paribus*, and economics is the only undergraduate field associated with earnings that differ significantly. The available evidence supports the hypothesis that economics training increases a lawyer's human capital compared with other undergraduate majors.

Key words: degree, earnings, economics, lawyers, major

JEL codes: A11, J24, J31, K00

Numerous studies have shown that the median and average earnings of those with a bachelor's degree exceed those of the less educated. Rates of return to a college education have been estimated to be between 7 and 12 percent, on average, over the last 30 years (e.g., Borjas 2000; Willis 1986). Although there are important alternative explanations, human capital theory provides a widely accepted

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justification for these facts: College-educated workers obtain higher earnings, in part, because they are more productive (e.g., Becker 1975; Wolpin 1977). A less well-understood issue, however, concerns the substantial variation in the earnings of college graduates: Why do some bachelor's degree holders earn much more and others much less than the median or average? A growing body of literature contains researchers' efforts to identify factors that can explain variation in earnings among college graduates with similar years of schooling. Among the several factors that have been identified, major field appears to have one of the strongest and most consistently unambiguous effects (Rumberger and Thomas 1993; James, Asalam, Conaty, and Duc-Le To 1989; Berger 1988a). In general, those who major in engineering, certain sciences, and business tend to earn higher salaries, and these differences tend to persist over time (Hecker 1995; Berger 1988a,b). This variation can be explained with a simple supply and demand argument. Demand for persons trained in certain fields is determined by the usual market forces; supply is determined by the ability and willingness of people to major in those fields; and salaries are determined by the interaction of supply and demand.

In this study, we examine the economic effect of college major from a different perspective. Rather than look at the economic returns to alternative bachelor's degrees, we considered the effects of the undergraduate major field of study on the earnings of those who go on to obtain advanced degrees in law. This line of investigation serves at least two purposes. Most directly, the study provides useful information to those planning a career in law. In addition, the analysis has implications for the human-capital theory of education. Do certain majors provide better preparation for a career in law than others? If so, this would suggest that education in those fields imparts a larger stock of the kind of human capital that is useful to lawyers. Because few, if any, undergraduate majors offer specific training in those things that lawyers actually do, any advantage of one major over another must be general and indirect—by providing either background information or training in critical thinking and analysis that happens to be particularly useful to those in the field of law.

Lawyers provide an interesting case study for several reasons. First, they form a somewhat homogeneous occupational group that has wide variation in preprofessional background. Second, economic success in the legal profession generally requires considerable knowledge and intellectual ability, implying that human capital acquired through education is particularly relevant. As Ehrenberg (1989) has pointed out, "returns to ability" (i.e., potential for salary growth over a career) are relatively high in law, where a senior partner can make four to six times as much as a new associate. Finally, lawyers are a socially important occupational group because of their high level of involvement in the political processes of our society.

A number of previous studies have examined the earnings of lawyers. Most of these have used regression techniques to address issues such as the career choices of law-school graduates (Kornhauser and Revesz 1995; Goddeeris 1988; Weisbrod 1983), gender and race discrimination in the legal profession (Haung 1997; Wood, Corcoran, and Courant 1993; Spurr 1990), and the determinants of lawyer earnings generally (Rosen 1992; Ehrenberg 1989). We are aware of no study that has investigated the effects of preprofessional education on the earnings of lawyers.

DATA AND EMPIRICAL MODEL

Our analysis was done on the basis of data from the National Survey of College Graduates (NSCG). The NSCG is a 1993 resurvey of 1990 census participants who reported having a bachelor's degree or higher degree from any source. The NSCG sampled approximately 215,000 individuals, of whom approximately 168,000 responded (78 percent response rate). The sample size varied on the basis of strata, with minorities and women subjected to greater sampling rates. The identification of law-school graduates was accomplished by crossing degree type (Other Professional, e.g., J.D., LL.B.) with degree field of law/legal studies. There are 3,207 raw records on the NSCG that fit this definition of law-school graduates and, when weighted, yield a nationally representative cross-section of approximately 946,000 law-school graduates.¹

For purposes of this study, we restricted the sample to only those law-school graduates who reported that they were currently working full time as a lawyer or judge, which yielded 2,072 observations. Descriptive statistics for the sample (Table 1) showed that white men tended to select the full-time lawyer-or-judge

TABLE 1. Sample Characteristics

Respondent characteristic	Occupational status					Row count
	Lawyer or judge		Other occupations		Unemployed	
	Full time	Part time	Full time	Part time		
Average age	38.8	41.0	42.3	40.1	44.0	—
Average no. of children	1.0	0.9	1.0	0.7	0.7	—
Average years prof. experience	14.5	15.0	16.3	14.4	17.1	—
Percentages						
Male	67.6	2.3	19.7	1.9	8.6	2,293
Female	57.1	8.5	16.2	3.8	14.3	914
Married	64.7	4.6	19.0	2.2	9.6	2,262
Not married	64.4	2.9	18.0	3.0	11.7	945
White	66.6	4.3	16.8	2.4	9.8	2,519
Minority	57.3	3.2	25.4	2.5	11.6	688
Economics B.S. degree	66.7	2.8	21.7	1.7	7.2	180
Other B.S. degrees	64.5	4.1	18.5	2.5	10.4	3,027
All respondents	64.6	4.1	18.7	2.4	10.2	3,207
Count by occupational status	2,072	130	599	78	328	—

Note: Percentages are based on row totals.

Source: Data are from the 1993 National Survey of College Graduates.

category at a greater rate than minorities and women. In addition, compared with those omitted from the sample, the restricted sample was younger, on average, and consisted of a higher proportion of white men. Finally, it is interesting to note that persons with bachelor's degrees in economics appeared in the full-time lawyer-or-judge cohort a little more often than those with other degrees.

These observations highlight the fact that the final data set might be considered a selected sample, introducing the possibility of sample selectivity bias. Because our objectives were to investigate the relationship between undergraduate field of study and earnings for those working full time in the legal profession, we assumed that selectivity was not a problem, given our specified population. Nevertheless, it is worth noting that by defining the population in this manner, we limited the scope of the analysis considerably and ignored a number of potentially interesting issues (e.g., does the choice to work full-time in the legal profession depend on college major?).

Following a well-established tradition in the empirical literature on neoclassical models of the determinants of earnings, we began by specifying that the natural log of annual salary for lawyers is a linear function of demographic factors, employment conditions, and human-capital factors.² Specific explanatory variables within each of these general categories were determined by theory, data availability, and statistical feasibility. On the basis of these considerations, we either constructed or obtained directly a number of variables from the NSCG data set. A synopsis of the variables used in the analysis is given in Table 2 and summary statistics are in Table 3. We discuss each variable in more detail later.

Demographic Factors

All of the standard demographic factors were accounted for in the analysis including gender, age, marital status, family structure, and race. The effects of race were captured with four classifications: white (81.0 percent of the sample), black (5.9 percent), Hispanic (7.5 percent), and other minorities (5.6 percent). The white majority was the excluded categorical variable and thus represented the benchmark group. Most individuals within the other minorities category were Asians (83 percent) and a smaller percentage were American Indian (16 percent).

Marital status was modeled with a single dummy variable indicating whether the individual was currently married (*married*). Family structure was represented by the number of children living with the respondent as part of the family (*children*). Because of the differential impact that marriage and family may have by gender, a number of interaction terms involving gender, marital status, and family structure were also considered (married woman with children, single woman with children, single man with children, etc.). However, these interaction terms were not statistically significant, whether analyzed individually or jointly and were dropped from the model.

Human Capital Factors

In most statistical earnings models, the principal human-capital variables are

TABLE 2. Variable Definitions

Variable	Type	Definition
Salary	Quantitative	Dependent variable: natural log of annual salary in dollars
Demographic		
<i>Male</i>	Qualitative	Indicates that respondent is male
<i>Age</i>	Quantitative	Age of respondent
<i>Married</i>	Qualitative	Indicates respondents currently married
<i>Children</i>	Quantitative	Number of children living with respondent, as part of family
<i>Black</i>	Qualitative	Indicates respondents of black ethnicity
<i>Hispanic</i>	Qualitative	Indicates respondents of Hispanic ethnicity
<i>Other minorities</i>	Qualitative	Indicates respondents of other minority races
Human-capital		
<i>Experience</i>	Quantitative	Number of years since respondent received law degree
<i>Timeoff</i>	Quantitative	Number of years respondent was out of full-time work force since receiving law degree (calculated as experience minus full-time professional experience)
Employment sector		
<i>Nonprofit</i>	Qualitative	Indicates respondents working in the not-for-profit sector
<i>Self-employed</i>	Qualitative	Indicates respondents self-employed, in own not incorporated business
<i>State government</i>	Qualitative	Indicates respondents employed by a state government
<i>U.S. government</i>	Qualitative	Indicates respondents employed by the U.S. government
<i>Other sectors</i>	Qualitative	Indicates respondents employed in all other sectors besides the omitted sector (private-for-profit companies)
Preprofessional education		
A set of 12 categorical variables	Qualitative	<ul style="list-style-type: none"> • Nine variables representing various categories of undergraduate majors (Table 4); political science is the excluded group. "Other degrees" and "No degree indicated" are combined together. • Three variables representing highest graduate degree obtained in addition to law degree (Ph.D., M.S., or M.B.A.).

Source: Data are from the 1993 National Survey of College Graduates.

TABLE 3. Descriptive Statistics for Variables

Quantitative variables	Economics major	All other degree fields	Full sample
Salary			
Mean	87,154	76,543	77,158
St. dev.	38,560	39,242	39,272
Min	10,400	8,840	8,840
Max	150,000	150,000	150,000
Age			
Mean	37.7	38.9	38.8
St. dev.	10.1	9.5	9.5
Min	21.0	21.0	21.0
Max	65.0	65.0	65.0
Children			
Mean	1.0	1.1	1.0
St. dev.	1.2	1.2	1.2
Min	0.0	0.0	0.0
Max	5.0	8.0	8.0
Experience			
Mean	14.5	14.5	14.5
St. dev.	9.3	9.5	9.5
Min	1.0	0.0	0.0
Max	36.0	59.0	59.0
Timeoff			
Mean	0.5	0.7	0.7
St. dev.	0.9	2.2	2.1
Min	0.0	0.0	0.0
Max	5.0	47.0	47.0
Qualitative variable (percentages)			
<i>Male</i>	81.7	74.4	74.8
<i>Married</i>	66.7	70.9	70.6
<i>Black</i>	2.5	6.1	5.9
<i>Hispanic</i>	5.0	7.6	7.5
<i>Other minorities</i>	5.8	5.6	5.6

Note: Descriptions of degree-field and employment-sector variables are presented in Table 5.
Source: Data are from the 1993 National Survey of College Graduates.

experience and *years of schooling*, and these two factors have consistently been shown to have a strong effect on earnings. In this study, we included a variable measuring professional experience (*experience*), with a quadratic term included to capture the life-cycle pattern. Although the available data allowed for alternative ways to characterize this factor, the *experience* variable was defined as the number of years since receipt of a law degree, implying that time practicing law

is the most relevant professional experience.³ In addition, a related variable, *time-off*, indicating the number of years since receipt of the law degree that were not spent in the practice of law, was incorporated in the analysis along with *experience*. Alternative specifications involving net professional law experience (*experience* – *timeoff*) were also considered but did not perform as well.

Because we were examining a population in which the vast majority had essentially the same amount of education—a bachelor's degree and a terminal professional degree in law (no further education)—years of schooling was not included. Nonetheless, the lawyers in our sample had different undergraduate backgrounds, and a small percentage had advanced degrees along with the law degree; we describe these factors subsequently.

Employment Conditions

Because all persons considered in the data set were currently working either as lawyers or judges, the primary factor affecting employment conditions was sector of employment. We identified six sectors: (1) self-employed; (2) private, for-profit (used as the reference group); (3) state or local government employee; (4) U.S. government employee; (5) private, not-for-profit; and (6) other sectors. We expected salaries to vary across sectors according to the value created by lawyers and compensating differentials that arise from differences in the level of effort required, risk, and job satisfaction. Clearly, we would have liked to account for other factors associated with employment conditions such as geographical location, size of city, size of firm, and type of practice, but unfortunately, this information was not available from the NSCG data set.

Preprofessional Education

Although years of schooling and professional education were practically identical for most members of the population examined in this study, our primary interest was in investigating the effects of qualitative differences in their undergraduate degree fields. Variation with respect to this factor was large in the population, and over 100 distinct majors were represented in the sample. (The NSCG survey asked respondents to identify their college degree(s) by selecting from among 146 education codes.)

To facilitate statistical analysis—and following Eide (1994), Berger (1988a), Rumberger and Thomas (1993), and others—we collapsed the various undergraduate majors represented in the sample into broad categories (Table 4). Considering the available data, objectives of the study, and prior work, we defined 10 categories: science and engineering; social science; political science; education, arts and letters; history; business; accounting; economics; prelaw; and other majors. Political science was set apart from the other social sciences because there were a large number of political-science majors in the sample (it was the largest single undergraduate major). History was separated from arts and letters for a similar reason. Accounting was distinguished from other business majors because of its close relationship to the field of tax law. Economics included both

TABLE 4. Description of Categories Representing Undergraduate Majors

Major category	Primary fields of study represented (in order)
Science & engineering	All engineering fields, life sciences, physical sciences, mathematical sciences, and geographical sciences
Social science	All social sciences, excluding political science and economics, and psychology
Political science	Political science (the benchmark group in the empirical model)
Education, arts, & letters	Humanities, education, philosophy and religion, art, and music
History	History
Business	General business administration and management, finance, marketing (category excludes accounting and business economics)
Accounting	Accounting
Economics	Social science economics, business (or managerial) economics
Prelaw	Prelaw
Other degrees	General studies, criminal justice, journalism, communications, nursing, criminology, social work, other
No degree indicated	A small percentage of the survey respondents did not indicate an undergraduate field; these are combined with "other degrees" in the analysis

business economics and social-science economics and was singled out because there was *a priori* evidence suggesting it may provide particularly good preparation for a legal career (Mabry 1998; Nieswiadomy 1998; Cooter and Ulen 1997). In the empirical model, each education category was represented by a dummy variable, with political science being the excluded group.

As previously mentioned, some respondents had graduate degrees in addition to the law degree. An additional graduate degree implies more schooling and, hence, the possibility of greater human capital accumulation. To account for this effect, dummy variables were included to indicate the presence of an advanced degree in addition to law. On the basis of an examination of the data, three broad, mutually exclusive categories were defined according to the highest additional graduate degree obtained: a Ph.D. in any field, an M.S. in any field, and an M.B.A.

Descriptive statistics for the education variables by employment sector are provided in Table 5. Political science was the most popular undergraduate degree for lawyers working in all sectors, followed either by education, arts and letters, or by social science. As might be expected, business degrees were seen at relatively higher rates in the self-employed and for-profit sectors, whereas social science degrees found relative favor with persons working in the government and

TABLE 5. Percentage of Persons in Each Degree Field by Employment Sector

Degree field	Employment sector					Other sectors	All sectors
	Self-employed	For profit	State government	U.S. government	Nonprofit		
Science & engineering	7.4	7.8	5.6	10.1	0.0	0.0	7.1
Social science	9.6	9.9	15.8	11.1	20.4	14.3	11.1
Political science	20.5	23.6	22.4	21.2	28.6	21.4	22.2
Education, arts, & letters	12.3	12.8	15.2	14.1	6.1	17.9	12.9
History	11.3	10.7	13.4	8.1	20.4	10.7	11.4
Business	12.0	9.7	8.7	7.1	4.1	7.1	10.2
Accounting	4.3	4.2	1.2	4.0	0.0	3.6	3.7
Economics	6.4	6.6	3.4	6.1	0.0	3.6	5.8
Prelaw	3.9	4.1	2.5	3.0	6.1	0.0	3.7
Other degrees	7.7	7.5	8.1	10.1	14.3	14.3	8.1
No degree indicated	4.5	3.3	3.7	5.1	0.0	7.1	3.9
Sector count	814	760	322	99	49	28	2,072
(percentage of row total)	(39.3)	(36.7)	(15.5)	(4.8)	(2.4)	(1.4)	
Highest graduate degree							
Ph.D.	3.3	3.9	1.6	3.0	0.0	0.0	3.1
M.S.	8.6	10.0	7.1	10.1	6.1	14.3	9.0
M.B.A.	2.8	3.0	1.2	4.0	0.0	3.6	2.7
No graduate degree	85.3	83.0	90.1	82.8	93.9	82.1	85.2

Note: Unless otherwise indicated, percentages are based on column totals.

Source: Data are from the 1993 National Survey of College Graduates.

nonprofit sectors. Although most persons in the sample did not have an additional graduate degree, a fair number (about 9 percent overall) had M.S. degrees.

Average salaries varied across degree fields and employment sectors (Table 6). Persons with economics degrees had the largest overall average salary, followed by persons with accounting and business degrees respectively. With the exception of economics, which was associated with higher salaries in the three largest sectors, few patterns emerge in salary rankings across employment sectors.

RESULTS

Model Estimation and Testing

A primary concern in estimating the specified earnings equation was that it might contain endogenous explanatory variables. In particular, the employment sector and preprofessional education variables might be correlated with unobservable differences in ability or ambition. We considered common solutions to this problem—instrumental variables estimation and the use of proxy variables for ability—but found them not feasible because of data limitations. Hence, at the outset, we simply assumed that the preprofessional education choices modeled in this analysis were not related to ability to perform in the legal profession. We discuss later the potential implications of this assumption and an informal test.

We dealt informally with the potential endogeneity of the employment sector variables by estimating the originally specified model, using the full sample, and also by estimating separate earnings equations for the self-employed, for-profit and state government sectors (those sectors having sufficient observations) for comparison. The former specification had the advantage of more observations but was more likely to have an endogeneity problem; earnings equations estimated by sector used considerably fewer observations but were less likely to have endogeneity problems (estimated earnings equations are presented in Table 7).⁴

Another important econometric issue concerns the fact that the dependent variable was top censored, that is, all annual salaries greater than \$150,000 were reported as \$150,000. Ordinary least squares (OLS) is biased and inconsistent in this situation, and the Tobit model provides a consistent estimation method. However, the degree of inconsistency of OLS depends on the proportion of limit observations (Davidson and MacKinnon 1993, 537–38). In this data set, the proportion of limit observations was relatively small, approximately 12.7 percent, and the degree of inconsistency inherent in OLS should be relatively small. To explore this issue, we initially estimated each equation with both the OLS and Tobit methods and, as expected, found the results to be quite similar in all respects. In particular, we found that all of the diagnostic and hypothesis tests we considered yielded identical conclusions. Therefore, because it is generally more convenient to use and interpret standard OLS methods, we did subsequent model development and testing using OLS and associated procedures. Final results are reported for the OLS estimates only.

In all cases, a general test for functional form misspecification (Ramsey's RESET) indicated that the assumed log-level model was acceptable. Further

TABLE 6. Average Salary by Degree Field and Employment Sector, in \$1,000s

Degree field	Employment sector					All sectors
	Self-employed	For profit	State government	U.S. government	Nonprofit	Other sectors
Science & engineering	85.1	79.8	56.9	52.5	—	—
Social science	79.3	79.8	58.4	78.1	33.3	64.5
Political science	82.8	80.7	57.1	63.5	56.8	64.2
Education, arts, & letters	86.4	76.3	60.0	73.3	81.8	88.0
History	82.6	86.4	54.7	72.5	62.3	47.7
Business	88.8	81.3	54.2	54.6	29.7	125.5
Accounting	94.7	75.9	61.6	54.2	—	78.0
Economics	97.5	84.6	70.5	52.6	—	70.0
Prelaw	86.3	76.5	51.1	73.8	37.3	—
Other degrees	79.1	77.9	56.0	78.8	60.2	38.1
No degree indicated	85.6	69.5	68.5	79.2	—	56.7
All degree fields	85.2	79.9	57.9	67.1	52.8	67.5
						77.2

Source: Data are from the 1993 National Survey of College Graduates.

TABLE 7. Regression Results

Variable	Full sample	Employment sector		
		Self-employed	For profit	State government
Constant	10.852*	10.766*	10.901*	10.158*
<i>Male</i>	0.014	0.022	-0.007	0.046
<i>Age</i>	-0.008*	-0.013*	-0.008*	0.005
<i>Married</i>	0.076*	0.100**	0.092*	0.021
<i>Children</i>	0.024*	0.017	0.037*	0.027
<i>Black</i>	0.005	-0.115	0.077	0.107**
<i>Hispanic</i>	-0.051	-0.153**	-0.135**	0.133*
<i>Other minorities</i>	-0.103*	-0.159**	-0.008	-0.083
<i>Experience</i>	0.061*	0.069*	0.053*	0.051*
<i>Experience squared</i>	-0.001*	-0.001*	-0.001*	-0.001*
<i>Timeoff</i>	-0.025*	-0.037*	-0.018*	-0.018
<i>Nonprofit</i>	-0.431*	—	—	—
<i>Self-employed</i>	-0.152*	—	—	—
<i>State government</i>	-0.308*	—	—	—
<i>U.S. government</i>	-0.153*	—	—	—
<i>Other sectors</i>	-0.213*	—	—	—
Ph.D.	0.131* (0.058)	0.188** (0.099)	0.069 (0.081)	0.017 (0.147)
M.S.	-0.001 (0.039)	-0.008 (0.083)	0.034 (0.054)	0.001 (0.061)
M.B.A.	0.085 (0.066)	-0.040 (0.115)	0.269* (0.083)	-0.094 (0.242)
B.S. Science & engineering	0.009 (0.047)	0.058 (0.086)	0.007 (0.076)	-0.101 (0.079)
B.S. Social science	0.025 (0.038)	0.052 (0.072)	0.031 (0.065)	-0.003 (0.064)
B.S. Humanities	0.032 (0.036)	0.086 (0.073)	-0.027 (0.058)	-0.038 (0.059)
B.S. History	-0.011 (0.039)	-0.035 (0.079)	0.055 (0.060)	-0.057 (0.053)
B.S. Business	0.002 (0.041)	0.040 (0.075)	-0.034 (0.063)	-0.022 (0.059)
B.S. Accounting	0.004 (0.063)	0.117 (0.106)	-0.104 (0.095)	0.098 (0.111)
B.S. Economics	0.127* (0.043)	0.187* (0.084)	0.089 (0.056)	0.160* (0.064)
B.S. Prelaw	0.005 (0.053)	0.121 (0.090)	-0.072 (0.089)	-0.098 (0.086)
B.S. Other	-0.016 (0.039)	0.034 (0.076)	-0.049 (0.062)	0.010 (0.051)
Standard error of regression	.47	.56	.45	.29
R^2	.28	.18	.26	.54

(Table continues)

TABLE 7—*continued*

Variable	Full sample	Employment sector		
		Self-employed	For profit	State government
Number of observations	2,072	814	760	322

Notes: Quantities in parentheses below estimates are heteroskedasticity-robust standard errors (standard errors not included with control-variable parameters to save space). * indicates estimate is statistically significant at the .05 level, based on a two-tailed test; ** indicates statistical significance at the .10 level.

Source: Data are from the 1993 National Survey of College Graduates.

diagnostic tests (the Breusch-Pagan test and a modified White test) showed evidence of heteroskedasticity in the full sample and in the self-employed sector but not in the for-profit and state government sectors. Hence, for consistent comparisons, we estimated and reported heteroskedasticity robust standard errors of the type that are unbiased in the presence of homoskedasticity (Davidson and MacKinnon 1993, 552–56).

Because the effects we were interested in might differ by gender, separate regressions were initially estimated for men and women. In each equation, the hypothesis that all of the coefficients were the same for men and women could not be rejected by an *F* test at usual significance levels. This finding is consistent with the results obtained by Wood, Corcoran, and Courant (1993). We consequently pooled the data for men and women, restricting the coefficients to be the same across genders and included a dummy variable equal to 1 for men and 0 for women.

Control Variables

Most of the control variables performed as expected and were generally consistent with related prior work, with a few exceptions. We discuss the more noteworthy results here.

Demographic variables. An interesting finding was that the male indicator variable was statistically insignificant in all specifications. This contrasts sharply with earlier studies that have found a significant gender gap, for lawyers and in labor markets generally (e.g., Huang 1997). Apparently, the gender gap has been eliminated for lawyers in recent years—at least to the extent that large differences in earnings by gender could be explained by the other factors in the model.⁵

After controlling for other factors, being black had a statistically insignificant effect on earnings in all but the state government sector where this ethnic group may be receiving a premium. This result is generally consistent with several other studies that have found race effects to be relatively small for lawyers (e.g., Rosen 1992; Weisbrod 1983; Wood et al. 1993). Being Hispanic, on the other hand, appeared to have a negative effect in the self-employed and for-profit sec-

tors and a positive effect in the state government sector. Other minorities, primarily Asians, may be earning less than average in the self-employed sector. Thus, it appears that the race–wage gap depends on the particular ethnic group and employment sector under consideration.

Age was negatively associated with earnings, except in the state government sector. Overall, after controlling for years of experience, each additional year since birth reduced expected earnings by approximately 0.8 percent.

Being married and having children at home were associated with higher earnings in the for-profit sector; these effects were positive but insignificant (or only borderline significant) in the other sectors. This finding reinforces similar findings by Wood and colleagues (1993, 429) and supports the supposition that private firms are willing to pay more for the added stability that is often associated with marriage and family. For women, it has often been observed that marriage and children tended to reduce working hours and income. Men generally showed a breadwinner effect where marriage and family boost hours and income. Rosen's (1992) study of lawyer earnings found very little marriage discount for women but a breadwinner effect for married men. However, our analysis indicated that marriage and children tended to have a positive or negligible effect for both genders—that is, the breadwinner effect appeared to have become gender neutral for those in the legal profession.

Human-capital variables. The human-capital variables all had coefficient estimates conforming to theory. *Experience*, measured as years since receipt of the law degree (i.e., career age), had the highest level of explanatory power of any of the independent variables. As is common in human-capital models, the quadratic form indicated that each year of experience increased mean salary, although at a decreasing rate. Overall, at career age 5, an additional year of experience was associated with about a 5 percent increase in earnings, *ceteris paribus*; at career age 25, an additional year of experience added about 2 percent to annual earnings. As in Wood, Corcoran, and Courant (1993), career interruptions, measured by the variable *timeoff*, were associated with lower earnings, except in the government sector. It is likely that rate-of-skill obsolescence (reflected by the negative quadratic term and the negative effect of career interruptions) was lower in law than in technical fields such as microbiology or computer science.

Employment sector. The data in Table 6 suggest strong associations between sector of employment and earnings, and this was indeed the case. Using the full sample, all of the employment-sector variables were significant and negative compared with the excluded sector (private for-profit firms). The largest earnings penalty was in the nonprofit sector, which included many public-interest legal organizations. Lawyers who worked in this sector made about 43 percent less than private-for-profit lawyers, *ceteris paribus*. Lawyers working for state and local government (*stategov*) had the next largest sector gap, with approximately 30 percent lower earnings.

Preprofessional Education

An examination of the regression results showed that the effects of an

advanced degree were mixed. Having a doctorate in addition to the law degree was associated with significantly higher earnings in the self-employed sector (about 19 percent higher than those without Ph.D.s, with $p = .06$), whereas the effect was positive but statistically insignificant in the other sectors. Similarly, lawyers with M.B.A.s earned much more in the for-profit sector (about 27 percent, with $p = .001$), but the impact of that degree was clearly insignificant in the self-employed and government sectors.

The positive effects of the Ph.D. and M.B.A. degrees can be explained in two ways. First, obtaining an advanced degree in addition to the law degree represents a substantial human capital investment and lawyers who obtain this extra education may consequently be more productive, in certain settings. In addition, it might be that lawyers with extra training tend to specialize in especially lucrative fields of law, either because they are more qualified or because they choose higher-paying fields. It is not clear why these arguments do not seem to apply to Ph.D.s in the for-profit sector or to M.B.A.s in the self-employed sector. It could be that Ph.D.s are too specialized to be used fully by most law firms but are able to find high-value niches as self-employed providers of specialized litigation support services. Similarly, the added skills of an M.B.A. might be of greatest value in the corporate sector served primarily by large, for-profit law firms.

As opposed to the effects of a Ph.D. or M.B.A., we found that the M.S. had essentially no impact on earnings in any employment sector. Apparently, the additional education represented by an M.S. was not enough, or not of the right kind, to make one more productive or qualify one for specialized fields of practice.

With respect to undergraduate degree field, only the economics major appeared to have an important influence on the earnings of lawyers. According to our results, lawyers with a bachelor's degree in economics (either social science economics or business economics) earned approximately 18.7 percent more than those in the benchmark group (political science) in the self-employed sector and approximately 16.0 percent more in the state government sector, and these estimates were statistically significant at the .05 Type I error level, on the basis of a two-tailed test ($p = .03$ and $p = .01$, respectively). Thus, in these sectors, the estimated effect of the economics bachelor's degree was highly significant in both economic and statistical terms. In the for-profit sector, the point estimate implying that economics majors make 8.9 percent more on average was not significant at the usual .05 Type I error level ($p = .11$). With respect to the overall equation, our results indicate that lawyers with economics degrees made about 12.7 percent more than the benchmark group. For all other undergraduate majors considered in the study, essentially no systematic difference in earnings was evident whether considering the full sample or individual employment sectors.

DISCUSSION

Our results are consistent with the analysis of Nieswiadomy (1998) who found that economics majors tended to score among the highest of all those who take the Law School Admissions Test (LSAT). Apparently, those with an undergraduate degree in economics tend to be well prepared for law school. However, the

implications go beyond Nieswiadomy's findings because, as discussed later, higher earnings were not associated with any of the other majors that also perform relatively well on the LSAT.

Given the estimated equations, there are at least two possible explanations for our finding concerning the relationship between an undergraduate degree in economics and the earnings of lawyers. First, it might be a consequence of self-selection. For instance, it might be that those prelaw students who are especially talented or ambitious self-select into the field of economics, implying that the field attracts those with naturally higher earnings potential. Similarly, it could be the case that those who major in economics tend to choose higher paying fields of law because of preferences associated with their choice of the economics major. This explanation implies that whereas there is an association between an economics degree and higher earnings, there is not a cause and effect relationship. The other possible explanation is that an economics education helps students develop a stock of human capital that is particularly valuable to those in the legal profession.

We can get some indication of the effects of self-selection by comparing economics majors to others who are likely to have above-average ability or ambition. It is worth noting that the undergraduate fields that might attract the academically ambitious, such as science or engineering, or the more financially motivated, such as business or accounting, did not tend to produce higher salaries for lawyers. Further exploring this line of reasoning, we created an additional category consisting of those undergraduate majors, other than economics, that tend to produce the highest LSAT scores: physics, math, philosophy, and religion (Nieswiadomy 1998). These are the four disciplines identified by Nieswiadomy as producing higher LSAT scores than economics produced. In constructing the dummy variable, these disciplines were removed from the science and engineering (physics and math) and education, arts, and letters (philosophy and religion) categories. They were combined together to obtain a new category having a meaningful number of observations (55).

In addition to yielding high LSAT scores, most of these fields are generally thought to have a relatively high degree of academic rigor. If self-selection in choice of major was driving our result concerning the effect of an undergraduate degree in economics, then one would expect to see its impact reflected in these disciplines as well. However, our findings indicated that an undergraduate degree in these high-ability fields was not associated with higher earnings for lawyers. Using the full sample, we found that the estimated coefficient on the dummy variable was .058 with a p value of .44; similar results were obtained in each sector. Moreover, when the category was expanded progressively to include a larger and larger number of high-scoring LSAT majors, the coefficient remained statistically insignificant.

The idea that lawyers with an economics bachelor's degree might self-select into higher paying fields of law seems implausible for the following reason.⁶ We assert that, with some exceptions, most lawyers maximize money income. If those with an economics degree have a greater propensity to choose higher paying areas of law, it would imply that those with other degrees do not know, or do not care, which fields pay better. It seems more likely that higher quality lawyers,

or those who are perceived as higher quality, are more able to obtain positions in the higher paying fields—regardless of undergraduate degree.

A related issue involves legal education and law-school admissions.⁷ Prior to 1970, having an economics baccalaureate degree would probably not have been helpful in law school. However, the 1970s saw rapid growth in “law and economics” in legal education, especially at the top schools.⁸ Today, many law lectures are replete with references to opportunity costs, transaction costs, moral hazard, and other economics concepts. Students with an economics background therefore have an advantage (slight) that could translate into better performance in law school and better initial job opportunities. Moreover, given the importance of economics in legal education at the top schools, it might be that better schools tend to favor economics majors, *ceteris paribus*, in the admissions process. If this is the case, economics majors would have disproportionate representation at leading law schools and consequently higher earning potential. Unfortunately, we could not test these hypotheses. Nevertheless, it would seem that the influence of these factors on the earnings equations, if any, would be rather small.

Although firm conclusions cannot be drawn from this analysis, the available evidence suggests that the effect of an economics bachelor’s degree on the earnings of lawyers results from more than simply self-selection effects. Hence, it appears that the development of additional human capital may be playing some role.

Moreover, there is substantial anecdotal evidence indicating that an undergraduate degree in economics increases the human capital of lawyers. For instance, the director of admissions for the University of California at Berkeley’s law school, Edward Tom, has stated:

Of all majors, economics ranks in the top four or five consistently year after year for both applicants and admissions. . . . *Logical reasoning and analytical skills are critical to legal studies* (quoted by Mabry 1998, italics added).

Cooter and Ulen (1997, 7) assert:

The economic analysis of law is an interdisciplinary subject that brings together two great fields of study and facilitates a greater understanding of both. Economics helps us to perceive law in a new way, one that is extremely useful to lawyers and to anyone interested in issues of public policy.

The following facts also suggest the importance of economics to legal thinking and practice (Cooter and Ulen 1997, 2). At least one economist is on the faculty of each of the top law schools in North America. Joint degree programs in law and economics (Ph.D. in economics and a J.D. in law) are offered at a number of leading universities. The economic approach is used in many law review articles, and several journals are devoted exclusively to the field of law and economics. Articles using the economic approach are cited in the major American law journals, more than articles using any other approach. In 1991 and 1992, the Nobel Prize in Economics was awarded to economists who helped found the economic analysis of law (Ronald Coase and Gary Becker). Finally, a number of law-and-economics scholars have become federal judges and often use economic analysis in their opinions—for instance, Justice Stephen Breyer, U.S. Supreme Court,

and Justices Richard A. Posner and Frank Easterbrook, U.S. Court of Appeals for the Seventh Circuit.

SUMMARY AND CONCLUSIONS

Using nationally representative cross-sectional data, we examined in this study the effects of preprofessional education on the earnings of lawyers and judges. A statistical earnings function was specified and estimated, on the basis of well-established theory and principles. Most of the results were consistent with theory and prior work. However, a tangential result of some consequence concerned the gender gap among lawyers. After controlling for other explanatory factors, we found essentially no difference between the earnings of men and women.

Along with variables accounting for demographic factors, human capital factors, and employment sector, categorical variables were included to represent graduate degrees in addition to the law degree and an assortment of undergraduate major fields. We found that whereas M.S. degrees appeared to have little or no effect, holding a Ph.D. or M.B.A. degree, in addition to the law degree, was associated with higher earnings in some sectors.

The evidence indicated that lawyers with undergraduate training in economics tend to earn more than other lawyers, *ceteris paribus*. Those who obtain an undergraduate degree in economics earned approximately 12.7 percent more than others, on average, and this was the only undergraduate field associated with earnings that differ significantly. Although this finding could be the result of self-selection, the available evidence supports the hypothesis that economics training increases a lawyer's human capital, as compared with other undergraduate majors. In any case, it seems that college students anticipating a career in law would be well advised to consider carefully the economics major.

NOTES

1. For a detailed discussion of law school graduates in the 1993 NSCG, see Baker and Jorgensen (2000).
2. See Berndt (1991), chapter 5, for an overview of this literature.
3. An alternative measure of experience is the survey variable *years of full-time professional experience* that includes all professional experience, in law or otherwise, excluding breaks in employment. This variable might be preferred on the grounds that all professional experience adds to human capital. However, in preliminary regressions, the *experience* variable defined as years of full-time professional experience did not perform as well as the experience variable years since receipt of law degree.
4. To facilitate interpretation, note that the assumed functional form implies that $100 \times \hat{\beta}_j$ estimates the percentage change in salary associated with a one unit change in variable j , where $\hat{\beta}$ is the estimated parameter associated with variable j .
5. In the legal profession, women and minorities tend to specialize in areas (e.g., women in family law) and sectors (e.g., private nonprofit, government) that pay lower salaries. As discussed by Ferber (1998), employment setting may itself be tainted by discrimination. For example, women may move into these areas because they are funneled by counselors or employers. The choice might also be related to expected interruptions in working career. However, an interesting finding of this study is that the difference between male and female salaries remained insignificant, even when controlling for sector of employment.
6. We thank an anonymous reviewer for suggesting this argument.

7. We are indebted to an anonymous reviewer for pointing out this issue.
8. Using measures such as the percentage of law faculty holding an economics Ph.D. and the number of law and economics articles published in legal journals, Ellickson (1989) traced the rapid growth in law and economics in legal education throughout the 1970s but argued that the growth flattened in the 1980s. In a later article, Ellickson (2000) found evidence of continued growth through 1996.

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