Do More Productive Faculty Produce More Productive Students?

Evidence for Agricultural Economics Ph.D.s From 1987-2000

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Introduction

Peer-reviewed publications are economic currency for academics. Hence, a question of importance, to both potential employers and potential students, is which factors combine to produce a successful researcher. Previous studies examining this question for the economics profession have found that students graduating from top programs are more likely to publish in core economics journals (Coupe, 2003 and Buchmuller, Dominitz, and Hansen, 1999) and that students graduating from programs with more active faculty publish more journal articles (Hogan, 1981). While such studies have suggest a causal relationship between program quality and future publishing success the fact that such up to 30 percent of top program graduates never publish any articles (Buchmuller, Dominitz, and Hansen, 1999) indicates that, in the words of Krueger and Wu (2000), there "nonetheless is considerable uncertainty in forecasting which applicants will be successful economists (p. 93)." As such, the literature on graduate education factors associated with early career success remains underdeveloped.

This study fills two gaping holes in the literature. First, the agricultural economics literature has yet to empirically examine the impact that graduate program quality has on a student's future research productivity. Second, previous studies have failed to empirically study the relationship between the quality of a Ph.D. recipient's dissertation advisor and his or her future productivity. We believe that this effect might prove important because one of the most significant influences on a student throughout the course of his or her graduate education is surely his or her dissertation advisor. We posit that because advisors have more information about a student's research potential the quality of a student's dissertation advisor should be a better predictor of his or her early career productivity than the program from which he or she receives the Ph.D.

We examine a unique data set on 1,530 students receiving their Ph.D.s from top-ranked Agricultural Economics programs between 1987 and 2000. The summary statistics suggest that the most productive students are most likely to graduate from top programs while students graduate from lower ranked programs are more likely not to publish. In addition, the more productive students are in their early careers the more likely their dissertation was directed by an elite advisor, and vice versa. Our main finding is that, controlling for program quality, student-advisor match is a significant predictor of early career research productivity. Moreover, controlling for advisor rank greatly reduces the estimated productivity differences due to program quality, ceteris paribus, suggesting that much of the estimated productivity difference previously attributed to differences in program quality might actually be explained by differences in the student-advisor match. Hence, the estimated differences suggest that the student-advisor match provides an important signal as to whether the student will publish any articles and particularly strong signal as to whether he or she will ever publish articles in top journals.

1. Data

This study is the first to construct a comprehensive data set that matches Agricultural Economics Ph.D. recipients to dissertation advisors, peer-reviewed publication histories, graduate program, dissertation field, sex, and domestic/international status. In 1987, the *Dissertation Abstracts* database (published by ProQuest Information and Learning) started including the name of the student's dissertation advisor for each dissertation accepted at accredited North American educational institution.[1] From that database, we are able to collect information on 1,530 dissertations filed in Agricultural Economics fields between 1987 and 2000 for students graduating from top for Ph.D.-granting Agricultural Economics programs. We define top programs as the 22 with good enough reputations to be ranked by Perry (1999).[2] We restrict our sample to top programs because they are the most likely to value research productivity and we define unique program ranking tiers based on whether a program's average reputation rank was greater than 4 (*Tier 1*), between 3 and 4 (*Tier 2*), or less than 3 (*Tier 3*).[3] Table 1 demonstrates these breakdowns. While it is clear why we start with 1987 degree recipients, we cut off our time frame in 2000 to allow sufficient time for students to start their publishing careers. Finally, to make sure that we only include students writing on Agricultural Economics topics, we cross-reference our list with the "Ph.D. Recipients Annual List" published each May in the *American Journal of Agricultural Economics*.

Individual-specific peer-reviewed publication data as of December 2004 are collected from *Econlit*, which is the American Economic Association's bibliography of economics literature throughout the world. The database contains information on articles published in more than 700 journals, including all the major field and general interest Agricultural Economics journals.[4] To define research productivity we consider several different metrics previously defined in the literature. Perry (1999) defines the top four agricultural economics journals in terms of Social Science Citation Index citations per article are the *American Journal of Agricultural Economics*, the *Journal of Environmental Economics and Management*, *Land Economics,* and the *Journal of Agricultural Economics*.[5] Beilock and Polopolus (1988) demonstrate the importance of regional journal citations for agricultural economists.[6] The literature examining publications in economics journals generally accepts Scott and Mitias' (1996) listing of the top 36 economics journals (Liner; Mein; Moore, Newman, and Turnbull, 2001; Dusansky and Vernon).[7] Accordingly, we consider four separate categories of articles: all peer-reviewed journals, core agricultural economics journals, regional agricultural economics journals, and top 36 economics journals. To account for differences in article length and author configuration, we further define the total number of author-weighted pages published in each journal. Finally, as is standard in the literature (Moore, Newman, and Turnbull, 2001), we exclude replies, comments, and other errata from our publication counts, as we only want to account for original research.

To compare students by the "quality" of their advisors we need a method for quantifying the relative research productivity of the 430 faculty we observe directing at least one dissertation during our time frame. Our approach is similar to the procedure used by Coupe (2003) to construct his well-known "Hall of Fame" of the top 1000 global economists. Coupe's rankings are calculated as a weighted-average of eleven different historically utilized metrics of research productivity. The importance of weighting an individual's ranking across several different metrics as opposed to relying on only one particular metric is to avoid the complaint that "we were disadvantaged by the specific weighting scheme." The weighted average we calculate is based on the total number of articles and author-weighted pages published in all peer-reviewed journals, core Agricultural Economics journals, and top 36 economics journals. While it is possible to quibble over whether a given individual should be ranked say 25th or 26th out of 430, we think that broader groupings are highly accurate in terms of relative research productivity.[8] Hence, we define an advisor as either being ranked among the top 100 (for lack of a better name, "*elite*" advisors), ranked between 101 and 300 ("*middle*" advisors) or ranked between 301 and 430 ("*bottom*" advisors).[9]

In the descriptive analysis that follows, we divide students into several broad rankings groups based on their early career productivity. To define these groups, we calculate a student Hall of Fame in a manner similar to that employed above. The primary difference is that because we have an uneven aged panel, our weighted average is based on the total number of articles and author-weighted pages *per year* since Ph.D. receipt for each of the same types of journals. The student ranking groupings we define are the top 10% of all students ("*top*" publishers), students between 11 percent and 25 percent ("*middle*" publishers), students between 26 percent and 58 percent ("*bottom*" publishers), and students in the bottom 42 percent because those students never publish any articles ("*non-publishers*").

2. Summary Statistics

We start our discussion with a descriptive summary of our data. This descriptive analysis is divided into three parts. First, we examine differences in individual characteristics across school, student, and advisor ranks. Next, we examine differences in the matching between programs and students and advisors and students. Finally, we examine differences in early career productivity across our different ranking groups.

3.1 Individual Characteristics

Table 2 presents individual characteristics across school, student, and advisor ranks. Overall, 81 percent of our students are male, 51 percent are international and, as of December 2004, the average number of years since the receipt of the Ph.D. was 9.95. Looking across school ranks, while the field remains male-dominated, females disproportionately graduate from Tier 1 programs with 21 percent of all Tier 1 graduates being female as opposed to only 16 percent of Tier 3 graduates. At the same time, a majority of Ph.D. recipients from Tier 2 and Tier 3 programs are international students while a majority of Ph.D. recipients from Tier 1 programs are international. In other words, it appears that lower-ranked programs turn to international students to fill many of the slots available in their programs. Turning to the student productivity rankings, nearly 88 percent of top publishing males are male while fewer than 82 percent of students in the less productive groups are male. Meanwhile, only 23 percent of top publishing students are international and this percentage increases systematically to a high of roughly 61 percent of non-publishing students. Finally, the pattern concerning international student is similar across advisor ranking groups, with only 45 percent of students working with elite advisors being international as opposed to 58 percent of students working with bottom advisors being international.

3.2 Program-Student and Advisor-Student Match

The three panels of Table 3 examine how students are distributed across programs and advisors. Table 3a presents the distribution of students across program tiers. Overall, 35 percent of our students graduate from Tier 1 programs while 41 and 25 percent, respectively, graduate from Tier 2 and Tier 3 programs. Not surprisingly, the most productive students are most likely to graduate from top programs, with nearly 62 percent of the top publishing students graduating from Tier 1 programs as opposed to only 26 percent of non-publishing students. At the opposite extreme, while only 8 percent of the top publishing students graduate from Tier 3 programs more than thirty-three percent of non-publishing students graduate from Tier 3 programs.

Table 3b turns to the distribution of advisors across program tiers. Overall, 30 percent of our advisors directed dissertation at Tier 1 programs while 43 and 27 percent, respectively, directed dissertations at Tier 2 and Tier 3 programs. Again, the best advisors are affiliated with the best programs, with 62 percent of elite advisors directing dissertations at Tier 1 programs and only 15 percent of elite advisors directing dissertation at Tier 3 programs. Conversely, while we observe only 27 and 11 percent of elite advisors directing dissertations at Tier 2 and Tier 3 programs we observe 47 and 38 percent of bottom advisors directing dissertations at Tier 2 and Tier 3 programs.

Table 3c combines the student and advisor distributions and demonstrates that overall 38, 42, and 20 percent of our students had their dissertations directed by elite, middle, and bottom advisors, respectively. Comparing across the student ranking groups, the clear pattern that emerges is that the more productive students are in their early careers the more likely it is that their dissertation was directed by an elite advisor, and vice versa. Specifically, nearly 64 percent of top publishing students had their dissertation directed by an elite advisor as opposed to only 27 percent of non-publishing students. On the contrary, only 5 percent of top publishing students had their dissertation directed by elite advisors as opposed to only 29 percent of non-publishing students.

Table 4 considers the number of dissertations directed by each of our 430 advisors. Overall, most advisors maintain lighter loads, with 81 percent directing 5 or fewer dissertations during our 14 year time-frame as opposed to 5 percent directing 10 or more. At the upper extreme, we observe three highly demanded advisors directing more than 20 dissertations. Comparing across the advisor ranking groups suggests that more productive faculty members are in higher demand as dissertation advisors. Namely, while small minorities of elite advisors work with 5 or fewer students large majorities of elite advisors work with 10 or more students. This pattern is reversed for middle and bottom advisors, with the notable exception of the three advisors who directed 16 dissertations. Combined, these data might suggest that students are, for the most part, making the strategic decision to work with the best possible advisors.

3.3 *Early Career Productivity*

Table 5 presents summary publication statistics across school, student, and advisor rank. Overall, students in sample had published an average of 2.98 articles by December 2004. Of these .67 were in core journals, .52 were in regional journals, and .16 were in top 36 journals. Comparing across the remaining panels suggest that students graduating from better programs and students working with better advisors average more publications of every type. These differences are largest for core and top 36 journals, as tier 1 graduates and students with elite advisors average roughly three times as many articles in those outlets. A notable exception to this trend is that Tier 2 graduates average almost as many regional publications as Tier 1 graduates. Finally, it is noteworthy that the top 10 percent of all Ph.D. recipients in our sample average nearly 15 total publications, of which 4.25 are in core journals, 2.90 are in regional journals, and 1.01 are in top 36 journals. These numbers drop dramatically, even to the immediately lower group of students ranked between 11 and 25 percent in early career productivity, for whom the average are 5.70 total articles, .94 core articles, .97 regional articles, and .24 top 36 articles.

Table 6 considers the phenomenon of students co-authoring articles with their dissertation advisors. The entries within each three-column panel should be interpreted as follows. The first column is the percentage of students within each group who publish a given type of article. The second and third columns are conditional on publishing an article of a given type and are the percentages of students co-authoring at least one of those articles with their advisor and the percentage of all articles of the given type that are co-authored with the advisor. The top row in Table 6 indicates that while 58 percent of students at least one article of any type, only 26, 22, and 9 percent publish at least one core, regional, or top 36 article, respectively. Looking throughout the table, one of the most notable findings is that many students appear to do their best work with their advisors. Namely, while only 59 percent of those students who ever publish coauthor at least one article of any type with their advisor nearly 75 percent of students publishing articles in core, regional or top 36 journals publish at least one of those articles with their advisors.

Comparing across the school, student, and advisor ranking groups in the bottom three panels of rows suggests two prominent trends. First, it appears that top students are more likely to work independently of their advisors. Specifically, for core, regional, and top 36 journals, the percentages of students co-authoring with their advisors increases from Tier 1 to Tier 3 programs. A similar, but more drastic pattern emerges across the student productivity groups. As a representative example, consider the publishing of core articles. Overall, 49 percent of top publishing students co-author core articles with their advisors as opposed to 97 percent of bottom publishing students. At the same time, on average, top publishing students only publish 19 percent of their core articles with their advisors while, on average, middle and bottom students publish 26 and 42 percent of their core articles with their advisors. Second, it appears that top advisors are more likely to continually co-author with their students, as students with elite advisors publish nearly 44 percent of their core, 29 percent of their regional and 35 percent of their top 36 articles with their advisors. This is opposed to students with bottom advisors publishing 33 percent of their core, 18 percent of their regional and 18 percent of their top 36 articles with their advisors. We can imagine two possible explanations for this finding: either (1) elite advisors are choosing to continue to co-author with their students because they realize that those students possess higher productivity levels and are therefore better coauthors or (2) elite advisors are themselves highly productive because they publish frequently with their advisees, perhaps by sharing credit for all papers published out of their dissertations.

3. Empirical Results

Our empirical work focuses on assessing the degree to which the rank of a student's dissertation advisor affects his or her early career productivity. To isolate this effect, we estimate the following standard equation

$$P_i = B_0 + B_1 A_i + B_2 Q_i + B_3 X_i + B_4 O_i + \varepsilon_i \qquad (1)$$

where P_i represents one of the four productivity measures, A_i is the rank of the student's dissertation advisor, Q_i is the reputation rank of the student's Ph.D. program, X_i is a vector of individual characteristics, and ε_i is an error term. The individual characteristics we consider are whether the student is male or an international student, the field in which the student's dissertation is filed, the number of years since the student received his or her Ph.D., and whether the student's first job was research-oriented. As demonstrated in Table 4, advisors differ greatly in their propensity to take on advisees. The number of other advisees a student's advisor agrees to take on might have competing effects on a student's future productivity. On one hand, the increased student-load could force the advisor to devote less time to each student, thereby harming the student's learning. On the other hand, anecdotal evidence suggests that prominent advisors might take on increased student-loads due to their love of mentoring students and thus may actually devote more time to each of their students than would have other advisors with smaller student-loads. To account for these possibilities, our vector of individual characteristics also includes O_i which indicates the number of other advisees with which the student's advisor worked during our sample period. Our main parameters of interest are B_1 and B_2 which indicate the effect that the rank of a student's dissertation advisor and the reputation rank of a student's Ph.D. program have on his or her early career productivity, all else constant.

An important estimation concern is that our productivity measures are truncated at 0 due to the fact that many students have not published articles in any of our journal categories. Hence, OLS estimation would result in biased and inconsistent parameters estimates. Truncated count data models are normally estimated as either a Poisson or a Negative Binomial, both of which account for the skewed distributions of the dependent variables (Cameron and Trivedi, 1998). A well-known problem with the Poisson distribution is the presumed equality of the conditional mean and variance functions. The data in our analysis fail tests of overdispersion for each productivity measure, suggesting that the assumption of equidispersion is violated and that the Poisson is not the correct distribution. As a result, we estimate each of our productivity functions with the Negative Binomial regression model, as that distribution accounts for the skewness of the data without requiring equality between the conditional mean and variance.

4.1 Are Graduates of Higher-Ranked Programs More Productive?

We start by examining the degree to which Ph.D. program affects early career productivity. The results are presented in Table 7. Because tier 3 is the omitted program tier, the coefficients represent the estimated differences in productivity for tier 1 or tier 2 graduates and otherwise similar tier 3 graduates, all else constant.[10] The results suggest that, all else equal, students graduating from more highly ranked programs are more likely to publish in their early careers. This finding is consistent with previous findings by Coupe (2001), Buchmuller, Dominitz, and Hansen (1999), and Hogan (1981) for the economics profession. Importantly, the estimated coefficients are nearly twice as large for tier 1 as for tier 2 students, suggesting that there are statistically significant differences across students graduating from the three program tiers. The notable exception is that, all else equal, there are no statistically significant cross-tier differences in the likelihood of publishing regional articles. In other words, unless the goal is publishing in regional journals, the highest likelihood for early career success lies with students graduating from tier 1 programs.

Turning to the remaining variables, our results suggest that, controlling for program reputation, years since Ph.D. receipt, and males are significantly more likely to publish than otherwise similar females while, all else constant, international students are significant less likely to publish than otherwise similar domestic students. These results are consistent with previous findings for the economics profession presented in Buchmuller, Dominitz, and Hansen (1999). The number of other advisees that a student's advisor supervises during our observed time-frame is estimated to have a significantly positive effect on all but the number of author-weighted pages published in core journals. This is not unexpected given that our summary statistics suggest that ranked advisors tend to supervise more dissertations.

The second page of results presents the estimated coefficients for the different dissertation fields relative to the omitted "general" category. There are a few general trends. For one, across nearly all metrics students writing their dissertations in consumer demand, and agricultural production publish significantly more articles than their otherwise equal peers. At the same time, students writing in environmental economics are significantly more likely to publish all, core, and top 36 articles while students writing on development economic topics are significantly less likely to publish regional articles and significantly more likely to publish top 36 articles. These findings are consistent across all estimated specifications and thus we do not present the dissertation field results below.

4.2 Are Students With Higher Ranked Advisors More Productive?

To examine the effect that the student-advisor match has beyond the initial student-program match, Table 8 presents results that add advisor rank to the previous estimates. Advisor rank is entered as a set of dummy variables, with the omitted group being students with bottom advisors. Hence, the coefficients presented in Table 8 represent the estimated differences in each of our productivity measures for students having an advisor belonging to a given ranking group or graduating from a program within a given tier relative to otherwise similar tier 3 students with bottom advisors. Overall, the results suggest two major findings. First, after adding controls for the rank of a student's advisor, the estimated differences between tier 1, tier 2 and tier 3 graduates become between 25 and 50 percent smaller in magnitude for every metric and become statistically insignificant for top 36 articles. At the same time, the estimated log likelihoods increase by amounts large enough to suggest that our controls for advisor rank are statistically significant. Together, these results might suggest that significant portions of the difference between top program graduates and bottom program graduates might be explained by the matching of the student to his or her dissertation advisor.

Second, after controlling for the quality of program from which a student graduates, students with elite advisors are statistically more likely to publish across all metrics than students with unranked advisors. Comparing the magnitudes of the estimated coefficients, suggests that the advisor effects are larger for core and top 36 articles. Hence, the estimated differences suggest that the student-advisor match provides a strong signal as to whether the student will publish any articles, and an especially strong signal as to the likelihood that a student will publish in top journals early in his or her career.

Comparing Tables 7 and 8 suggests two interesting differences once controls for advisor quality are added. First, controlling for advisor rank eliminates the statistical significance of the number of other dissertations supervised. This is not surprising given our thought that much of the originally estimated effect derived from the fact that more productive advisors tend to supervise more dissertations. Second, controlling for advisor rank also eliminates the statistical significance of program tier for top 36 articles. Combined with the fact that students with elite and middle advisors are statistically more likely than students with bottom advisors to publish such articles this might suggest that the main factor predicting whether a student publishes a top 36 article is the quality of advisor with which he or she works as opposed to the quality of program from which he of she graduates.

4. Conclusion

This paper examines the effect that both Ph.D. program and dissertation advisor quality have on a student's early career productivity. Regression results confirm the significance of working with a highly-ranked dissertation advisor, as we find that students working with top 100 advisors average significantly more publications, especially in terms of core and top 36 economics articles than students working with lower ranked advisors, ceteris paribus.

This information is potentially important for both potential employers and potential students. Research success is important to potential employers because more productive faculty members increase the research profile of a department, which in turn increases the department's reputation within the profession. As evidence, Thursby (2000) and Smyth (1999) find that within economics a department's reputation in the National Research Council (NRC) ratings increases with published research while Perry (1999) suggests that within agricultural economics programs with better reputations have those reputations because their faculty are more active publishers across several different metrics. Hence, when making hiring decisions departments focused on research potential should pay particular attention to the quality of a student's dissertation advisor. At the same time, knowing that potential employers should be interested in research promise, our results suggest that graduate students in agricultural economics should try to work with the best possible advisor. This latter point is further underscored by evidence in Hilmer and Hilmer (2005) and Sauer (1988) that higher quality publications have a statistically significant positive impact on a faculty member's annual salary.

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Notes

[1] According to its description, this database contains information on "dissertations on all academic topics accepted at accredited institutions since 1861, including more than 1.2 million citations (with abstracts since 1980) to doctoral degree dissertations by accredited North American educational institutions and more than 200 institutions elsewhere. Dissertation Abstracts represents original academic research from over 1,000 universities throughout the world. It is the most comprehensive information resource covering doctoral dissertations and master's theses, including content from a number of ProQuest dissertation print publications, including: Comprehensive Dissertation Index; Dissertation Abstracts International; Masters Abstracts International; American Doctoral Dissertations. Records include abstracts, authors, advisors, titles, institutions, degrees, dates, author-assigned subjects and descriptors, number pages and availability information. Subjects covered include agriculture & food science, architecture, art, bioscience and biotechnology, business, chemistry, economics, education, history, geoscience, law and political science, mathematics, music, pharmaceuticals, psychology, social science, veterinary sciences, zoology and more."

2 Perry (1999) developed a reputation ranking based on surveys of 62 of the most prominent members within the profession. While Peterson's Guide to Graduate Programs in the Humanities, Arts and Social Sciences, claims that 32 different departments in the U.S. offer Ph.D. degrees in agricultural economics, according to Perry only 22 were included on more than 16 percent of his survey responses and thus merited a reputation ranking. We thus limit our sample to only those 22 programs earning a reputation ranking.

[3] Those reputation rankings are based on a five point scale, where "a ranking of 5 indicated an excellent program, 4 corresponded to an above average program, 3 being average, 2 below average, and 1 being a poor program."

[4] *Econlit* includes such agricultural journals as Agricultural and Resource Economics Review, Agricultural Economics, Agriculture and Human Values, Agriculture and Resources Quarterly, Australian Journal of Agricultural and Resource Economics, Australian Journal of Agricultural Economics, Canadian Journal of Agricultural Economics, European Review of Agricultural Economics, Journal of Agricultural and Applied Economics, Journal of Agricultural and Resource Economics, Journal of Agricultural Economics, Marine Resource Economics, Natural Resource Modeling, Natural Resources Journal, and Review of Marketing and Agricultural Economics.

[5] Perry chooses these four journals because according to the Social Science Citation Index (SSCI) they are the only journals to have citation rates close to or higher than the citation rate for the AJAE.

[6] In their study, Beilock and Polopolus identify as regional journals the Western Journal of Agricultural Economics (now the Journal of Agricultural and Resource Economics), the Southern Journal of Agricultural Economics (now the Journal of Agricultural and Applied Economics), the Northeastern Journal of Agricultural Economics (now the Agricultural and Resource Economics Review), the Northcentral Journal of Agricultural Economics, and the Canadian Journal of Agricultural Economics.

[7] The Top 36 are the American Economic Review, Journal of Political Economy, Quarterly Journal of economics, Review of economics and Statistics, Econometrica, Economic Inquiry, Economic Journal, Economica, Industrial and Labor Relations Review, International Economic Review, Journal of Business, Journal of Business and Economic Statistics, Journal of Development economics, Journal of Econometrics, Journal of Economic Dynamics and Control, Journal of Economic History, Journal of Economic Theory, Journal of Finance, Journal of Financial economics, Journal of Human Resources, Journal of International economics, Journal of International Money and Finance, Journal of Labor economics, Journal of Law and economics, Journal of Law, economics and Organization, Journal of Legal Studies, Journal of Monetary economics, Journal of Money Credit and Banking, Journal of Public economics, Journal of Regional Science, Journal of Urban economics, National Tax Journal, Public Choice, Rand Journal of economics, Review of Economic Studies, and Southern Economic Journal.

[8] For example, our top 10, in alphabetical order, are Robert G. Cambers, Jean-Paul Chavas, Alain De Janvry, Wallace E. Huffman, Richard E. Just, Gordon C. Rausser, Todd Sandler, Andrew Schmitz, V. Kerry Smith, and David Zilberman. We believe that nearly everyone would agree that these faculty are among the most productive Agricultural Economists.

[9] This classification might seem somewhat arbitrary. However, we did explore a multitude of other categorical breakdowns (every 100, every 200, etc.) as well as the inclusion of a continuous measure of advisor rank. Every alternative specification yielded similar results and thus we believe that the results presented here are highly robust.

[10] It should be noted that the results are robust in that we used many different potential specifications for the school tier and advisor rank.

Table 1
1999 Reputation Survey Rankings (Source: Perry 1999, Table 1)

	Ranking	Ph.D. Program	Average Rank	Standard Deviation
Tier 1	1	UC-Berkeley	4.85	0.35
	2	UC-Davis	4.77	0.52
	3	Maryland	4.50	0.56
	4	Iowa State	4.34	0.65
	5	North Carolina St.	4.12	0.72
	6	Minnesota	4.10	0.76
Tier 2	7	Wisconsin	3.90	0.69
	8	Purdue	3.72	0.79
	9	Cornell	3.69	0.79
	10	Texas A&M	3.48	0.80
	11	Michigan State	3.43	0.90
	12	Illinois	3.42	0.90
	13	Ohio State	3.31	0.79
	14	Oregon State	3.20	0.72
Tier 3	15	VPI	2.99	0.80
	16	Penn State	2.95	0.73
	17	Kansas State	2.94	0.94
	18	Florida	2.90	0.72
	19	Missouri	2.89	0.56
	20	Oklahoma State	2.84	0.73
	21	Washington State	2.81	0.69
	22	Georgia	2.75	0.73

Table 2
Summary Individual Characteristics By Program Tier, Student Rank, and Advisor Rank

	Observations	Male	International Student	Years Since Ph.D.
All Students	1,530	.814	.508	9.951
School Rank:				
Tier 1	529	.790	.440	10.002
Tier 2	624	.819	.521	9.864
Tier 3	377	.841	.584	10.024
Student Rank:				
Top Publishers	154	.877	.227	9.909
Middle Publishers	229	.808	.380	9.266
Bottom Publishers	509	.815	.519	10.373
Non Publishers	638	.801	.614	9.870
Advisor Rank:				
Elite	583	.801	.449	9.887
Middle	639	.831	.527	9.950
Bottom	308	.799	.581	10.075

Table 3a
Summary Student Rank Distributions By Program Tier

		Student Rank			
	Observations	Top Publishers	Middle Publishers	Bottom Publishers	Non Publishers
Tier 1	529	95	101	168	165
Tier 2	624	47	94	224	259
Tier 3	377	12	34	117	214
Totals	1,530	154	229	509	638
Percentages:					
Tier 1	.346	.617	.441	.330	.259
Tier 2	.408	.305	.410	.440	.406
Tier 3	.246	.078	.148	.230	.335

Table 3b
Summary Advisor Rank Distributions By Program Tier

		Advisor Rank		
	Observations	Elite	Middle	Bottom
Tier 1	127	62	45	20
Tier 2	186	27	98	61
Tier 3	117	11	57	49
Totals	430	100	200	130
Percentages:				
Tier 1	.295	.620	.225	.154
Tier 2	.433	.270	.490	.469
Tier 3	.272	.110	.285	.377

Table 3c
Summary Student Rank By Advisor Rank

		Student Rank			
Advisor Rank	Observations	Top Publishers	Middle Publishers	Bottom Publishers	Non Publishers
Elite	583	99	119	192	173
Middle	639	47	79	230	283
Bottom	308	8	31	87	182
Totals	1,530	154	229	509	638
Percentages:					
Elite	.381	.643	.520	.377	.271
Middle	.418	.305	.345	.452	.444
Bottom	.201	.052	.135	.171	.285

Table 4
Number of Supervised Dissertation Distribution

	All Advisors		Elite Advisors		Middle Advisors		Bottom Advisors	
Number of Advisees	Freq.	Percent	Freq.	Percent	Freq.	Percent	Freq.	Percent
1	144	.335	16	.111	70	.486	58	.403
2	93	.216	16	.172	43	.462	34	.366
3	44	.102	10	.227	22	.500	12	.273
4	39	.091	8	.205	21	.538	10	.256
5	30	.070	8	.267	13	.433	9	.300
6	13	.030	4	.308	9	.692	---	---
7	22	.051	9	.409	9	.409	4	.182
8	11	.026	8	.727	2	.182	1	.091
9	5	.012	2	.400	2	.400	1	.200
10	8	.019	5	.625	3	.375	---	---
11	5	.012	3	.600	2	.400	---	---
12	1	.002	---	---	1	1.000	---	---
13	3	.007	2	.667	1	.333	---	---
14	4	.009	4	1.000	---	---	---	---
16	3	.007	---	---	2	.667	1	.333
17	2	.005	2	1.000	---	---	---	---
20	1	.002	1	1.000	---	---	---	---
24	1	.002	1	1.000	---	---	---	---
29	1	.002	1	1.000	---	---	---	---
Total	430		100		200		130	

Table 5
Summary Articles and Pages Published Statistics

	Total		Core		Regional		Top 36	
	Articles	Pages	Articles	Pages	Articles	Pages	Articles	Pages
All Students	2.975 (5.752)	22.765 (48.187)	.665 (1.779)	4.029 (12.008)	.523 (1.553)	3.376 (11.124)	.161 (.685)	1.435 (7.673)
School Rank:								
Tier 1	4.371 (6.925)	35.367 (60.968)	1.216 (2.519)	7.916 (17.690)	.599 (1.613)	4.150 (11.965)	.340 (1.010)	3.068 (11.791)
Tier 2	2.688 (5.488)	19.602 (43.421)	.454 (1.185)	2.367 (6.819)	.537 (1.742)	3.390 (12.184)	.083 (.446)	.740 (4.488)
Tier 3	1.491 (3.497)	10.319 (26.516)	.241 (.974)	1.325 (6.056)	.393 (1.047)	2.266 (7.357)	.040 (.275)	.293 (2.221)
Student Rank:								
Top	14.955 (10.622)	114.076 (95.025)	4.253 (3.669)	27.462 (26.243)	2.896 (3.535)	20.315 (26.187)	1.019 (1.607)	9.532 (20.716)
Middle	5.699 (3.343)	46.960 (37.179)	.939 (1.099)	5.401 (7.300)	.974 (1.484)	6.078 (10.436)	.240 (.805)	2.134 (6.689)
Bottom	1.853 (1.170)	12.789 (10.327)	.289 (.544)	1.372 (2.802)	.257 (.538)	1.266 (2.825)	.069 (.276)	.468 (2.058)
Non	--- ---	--- ---	--- ---	--- ---	--- ---	--- ---	--- ---	--- ---
Advisor Rank:								
Elite	4.523 (7.320)	34.965 (62.417)	1.208 (2.481)	7.600 (17.129)	.326 (1.009)	2.918 (11.607)	.732 (1.764)	4.894 (12.848)
Middle	2.238 (4.428)	16.888 (36.782)	.360 (.918)	1.978 (5.810)	.066 (.343)	.586 (3.490)	.452 (1.420)	2.796 (10.046)
Bottom	1.571 (3.850)	11.868 (29.887)	.269 (1.198)	1.524 (7.241)	.049 (.281)	.388 (2.391)	.273 (1.328)	1.705 (9.259)

Table 6
Summary Overall Publication and Publication With Advisor Statistics
(All Values Percentages)

	Total			Core			Regional			Top 36		
	% Publish	% Publish With Advisor	% Articles With Advisor	% Publish	% Publish With Advisor	% Articles With Advisor	% Publish	% Publish With Advisor	% Articles With Advisor	% Publish	% Publish With Advisor	% Articles With Advisor
All Students	.583	.593	.339	.264	.755	.418	.220	.743	.287	.094	.776	.309
School Rank:												
Tier 1	.688	.613	.309	.408	.710	.414	.234	.625	.156	.187	.746	.294
Tier 2	.585	.600	.368	.232	.816	.433	.210	.758	.359	.055	.843	.372
Tier 3	.432	.534	.338	.114	.801	.391	.218	.818	.369	.027	.833	.250
Student Rank:												
Top	1.000	.760	.194	.955	.489	.194	.779	.541	.203	.506	.640	.238
Middle	1.000	.638	.264	.568	.807	.264	.476	.717	.230	.144	.867	.263
Bottom	1.000	.523	.416	.250	.967	.416	.212	.943	.437	.063	.944	.531
Non	---	---	---	---	---	---	---	---	---	---	---	---
Advisor Rank:												
Elite	.703	.693	.372	.405	.706	.439	.264	.727	.293	.177	.767	.350
Middle	.557	.537	.325	.213	.870	.403	.224	.752	.310	.045	.771	.213
Bottom	.409	.429	.269	.104	.751	.329	.130	.796	.179	.036	1.000	.182

Table 7
Negative Binomial Regressions Controlling for Program Tier

	Total		Core		Regional		Top 36	
	Articles	Pages	Articles	Pages	Articles	Pages	Articles	Pages
Program Reputation Tier:								
Tier 1	.934**	1.130**	1.415**	1.605**	.185	.293	2.115**	2.652**
	(.115)	(.149)	(.170)	(.238)	(.189)	(.287)	(.324)	(.440)
Tier 2	.560**	.645**	.614**	.672**	.147	.177	.710**	.911**
	(.109)	(.141)	(.172)	(.225)	(.176)	(.250)	(.340)	(.430)
Individual Characteristics:								
Years Since Ph.D.	.067**	.066**	.103**	.111**	.081**	.064**	.121**	.102**
	(.011)	(.015)	(.015)	(.022)	(.018)	(.027)	(.026)	(.046)
International	-.593**	-.557**	-1.041**	-1.122**	-1.068**	-1.290**	-.606**	-.935**
	(.082)	(.109)	(.119)	(.164)	(.136)	(.200)	(.197)	(.324)
Male	.550**	.526**	.603**	.608**	.855**	1.030**	.811**	.998**
	(.110)	(.142)	(.158)	(.222)	(.192)	(.269)	(.284)	(.464)
Advisor Demand:								
Other Advisees	.550**	.018*	.018**	.019	.020*	.033*	.028**	.047*
	(.110)	(.009)	(.009)	(.014)	(.011)	(.018)	(.014)	(.025)
(Continued)								

Table 7
(Continued)

	Total		Core		Regional		Top 36	
	Articles	Pages	Articles	Pages	Articles	Pages	Articles	Pages
Dissertation Field:								
Consumer Demand	.437**	.389	.827**	.980**	.664*	.736	-1.662	-2.600**
	(.219)	(.291)	(.307)	(.449)	(.346)	(.511)	(1.081)	(1.060)
Production	.389**	.350*	.593**	.555*	.831**	1.053**	.476	.059
	(.158)	(.211)	(.214)	(.318)	(.242)	(.392)	(.352)	(.594)
Ag. Products	-.043	-.061	-.109	-.237	.313	.279	.007	-.253
	(.159)	(.207)	(.239)	(.317)	(.248)	(.366)	(.420)	(.608)
Ag. Inputs	.076	.043	.276	.236	.075	.047	-.210	-.333
	(.189)	(.250)	(.269)	(.378)	(.304)	(.448)	(.493)	(.710)
Resources	.006	.012	.258	.411	.105	.292	.233	.288
	(.159)	(.210)	(.225)	(.328)	(.258)	(.370)	(.385)	(.627)
Environmental	.363**	.313	.880**	.955**	.437	.611	1.022**	.747
	(.174)	(.233)	(.234)	(.358)	(.286)	(.426)	(.381)	(.657)
Ag. & Food Policy	.102	.199	.287	.209	-.028	-.049	-.145	-.351
	(.177)	(.236)	(.243)	(.361)	(.287)	(.425)	(.428)	(.649)
Econ. Development	.219	.416**	.017	.025	-.493*	-.602*	1.231**	1.500**
	(.152)	(.201)	(.226)	(.316)	(.271)	(.359)	(.339)	(.531)
International Econ.	.015	.157	-.126	-.136	-.049	-.202	.059	.057
	(.177)	(.231)	(.267)	(.354)	(.288)	(.410)	(.437)	(.658)
IO	-.369*	-.415	-.386	-.620	-.008	.083*	-1.033	-1.362
	(.223)	(.288)	(.322)	(.441)	(.345)	(.512)	(.707)	(.836)
pseudo-R^2	.036	.014	.088	.034	.059	.021	.140	.043
Log-Likelihood	-3,110.97	-5,179.75	-1,409.20	-2,356.02	-1,263.79	-2,085.08	-560.36	-999.94
Alpha	2.020	1.455	2.458	9.139	3.520	12.668	3.105	27.194
	(.104)	(.041)	(.229)	(.572)	(.343)	(.843)	(.584)	(2.792)

Notes: Value listed in the column heading is the dependent variable. **, * significant at 5 and 10 percent levels. The specific fields listed in the AJAE Dissertation By Subject list are: (1) Consumer Demand, (2) Production Economics & Supply, (3) Agricultural Products: Price Analysis, Subsector Models, Marketing, Futures, (4) Agricultural Inputs: Land, Labor, Finance, (5) Natural Resources: Energy, Conservation, Land Use, Water, Forestry, Fisheries, (6) Environmental Economics: Pollution, Regulation, Nonmarket Valuation, (7) Agricultural and Food Policy: Regulation, Taxation, Welfare, (8) Economic Development: Developing Economies, Aid, Regional, General Equilibrium, (9) International Economics: Trade, Integration, (10) Industrial Organization and Market Structure, and (11) General: Teaching, Extension, Research Methodology, Professional. General is the omitted group.

Table 8
Negative Binomial Regressions Controlling for Advisor Rank and Program Tier

	Total		Core		Regional		Top 36	
	Articles	Pages	Articles	Pages	Articles	Pages	Articles	Pages
Advisor Rank:								
Elite	.697**	.654**	.932**	1.092**	.350**	.989*	.788**	.857**
	(.131)	(.172)	(.188)	(.257)	(1.176)	(.557)	(.222)	(.320)
Middle	.320**	.318**	.255	.579**	.145	.146	.495**	.591**
	(.115)	(.146)	(.179)	(.235)	(.349)	(.477)	(.195)	(.268)
Program Reputation Tier:								
Tier 1	.700**	.930**	1.031**	1.279**	1.553**	2.082**	-.006	.120
	(.123)	(.160)	(.181)	(.260)	(.339)	(.517)	(.201)	(.302)
Tier 2	.505	.628**	.519**	.644**	.541	.787*	.108	.136
	(.109)	(.140)	(.172)	(.226)	(.341)	(.453)	(.176)	(.251)
Individual Characteristics:								
Years Post Ph.D.	.064**	.061**	.099**	.108**	.116**	.079*	.080**	.063**
	(.011)	(.015)	(.015)	(.023)	(.026)	(.047)	(.017)	(.026)
International	-.563**	-.532**	-1.020**	-1.157**	-.540**	-.954**	-1.019**	-1.257**
	(.082)	(.109)	(.118)	(.164)	(.194)	(.321)	(.135)	(.200)
Male	.508**	.473**	.586**	.553**	.813**	1.029**	.807**	1.011**
	(.109)	(.143)	(.156)	(.221)	(.279)	(.471)	(.192)	(.269)
Advisor Demand:								
Other Advisees	.004	.008	.003	.007	.006	.024	.006	.016
	(.007)	(.010)	(.009)	(.014)	(.014)	(.027)	(.012)	(.019)
pseudo-R2	.040	.016	.098	.037	.059	.021	.140	.043
Log-Likelihood	-3,096.82	-5,172.66	-1,393.31	-2,347.45	-1,257.54	-2,081.52	-549.93	-997.78
Alpha	1.957	4.233	2.263	8.880	3.520	12.668	3.105	27.194
	(.102)	(.174)	(.217)	(.558)	(.343)	(.843)	(.584)	(2.792)

Notes: Notes: Value listed in the column heading is the dependent variable. **, * significant at 5 and 10 percent levels. Regressions also include binary dummy variables indicating the field in which the dissertation was written (general is the omitted group).