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RESEARCH PRODUCTIVITY AND CONCENTRATION AMONG AGRICULTURAL ECONOMICS FACULTY IN THE NORTHEAST

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ABSTRACT

Research activities of academic agricultural economists in the Northeast Region are examined. Selected categories of research output are presented. Interregional comparisons in research productivity are made between: 1) faculty employed in the Northeast and those employed elsewhere and 2) faculty educated in the Northeast and those educated elsewhere. Intraregional comparisons of faculty employed in the Northeast by region of education are also presented. Regional differences in research resources and concentration are examined and offered as factors contributing to research productivity differences. Results indicate few significant long-run differences in research productivity and concentration in the Northeast relative to that in other regions.

INTRODUCTION

Agricultural economics faculty are sensitive to matters of research resources, productivity and rewards. The priorities given to research productivity for professional advancement have created a greater need for information on faculty research activities. Previous studies on research related activities of agricultural economics faculty have examined faculty contributions to the American Journal of Agricultural Economics (Arnold and Barlowe; Finley; Holland and Redman), faculty contributions to major economics journals (Opaluch and Just), authorship concentrations in the Journal of Farm Economics (Neilson and Riley) and relationships between research productivity and faculty salaries (Broder and Ziemer, 1982; Strauss and Tarr; Lee).

Regional comparisons of research productivity among agricultural economics faculty have been made for the Southern Region (Oursbourn, Hardin and Lacewell; Broder and Ziemer, 1980) and for the North Central Region (Ziemer, Broder and Spurlock). This particular paper will examine research activities of academic agricultural economists in the Northeast Region. Data and methodology used in this paper will be adapted from previous regional studies in an attempt to identify the unique research related activities of faculty in the Northeast Region.

The objectives of this paper are to:

1. Describe the research productivity of agricultural economics faculty who are employed in the Northeast Region;
2. Describe the research productivity of agricultural economics faculty who were educated in the Northeast Region;
3. Identify regional differences in research resources and their impacts on research productivity;
4. Examine regional concentrations in research productivity among agricultural economics faculty.

The findings of this paper can be used in establishing and evaluating personal, professional and administrative criteria for faculty research productivity. These findings may also be useful in identifying unique research characteristics of faculty who are employed and/or educated in the Northeast and in identifying and adjusting resource factors which may influence research productivity.

DATA AND FORMAT

The data and format of this study were adopted from previous studies on regional comparisons of research activities among agricultural economics faculty (Broder and Ziemer, 1980; Ziemer, Broder and Spurlock). Data for this and the aforementioned studies was gathered through a mailed questionnaire as part of a general survey of 500 randomly selected academic agricultural economists at major land grant universities.[1] The analysis in this paper is based on 241 usable responses and is limited to faculty who held PhD degrees at the time the survey was conducted (February, 1980). Because of missing and incomplete responses to some questions, the number of usable observations varied across statistical tests. The delineation of the Northeast Region was adapted from a study of agricultural economics faculty mobility by Peck and Babb and includes the following universities: Connecticut, Cornell, Delaware, Maine, Maryland, Massachusetts, New Hampshire, Rhode Island, Pennsylvania State, Rutgers and Vermont.

RESEARCH PERFORMANCE

The measures of research productivity presented in this paper are not intended to be all-inclusive of faculty research output. Productivity measures which are reported represent seleded research outputs which could be readily identified, measured and compared across faculty and regions. Average research productivity of agricultural economics faculty employed in the Northeast are shown in Table 1. Selected categorical publications and research rewards of faculty in the Northeast are compared to faculty in all other regions of the United States (Peck and

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[1] Individuals for the sample were listed in Professional Workers in State Agricultural Experiment Stations and Other Cooperating State Institutions/1978-1979. Agricultural economics faculty in this study were broadly defined to include agricultural, food and resource economics faculty.

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Table 1. Research Productivity of Agricultural Economics Faculty by Region of EMPLOYMENT, 1979.

	Region of Employment					
	Northeast	All Others	Northeast	All Others	Northeast	All Others
	faculty average					
Computed on Basis of:	Career[a]		100% Research[b]		Annual Average[c]	
Number of Papers In:						
Amer. J. Agr. Economics	1.22	1.91	2.85	4.26	0.13	0.13
Other National Journals	2.51	3.71	5.32	9.00	0.33	0.26
Foreign Journals	0.49	1.92	1.16	4.06	0.05	0.10
Regional Journals	1.95	2.00	5.55	5.06	0.25	0.19
Books	0.45	0.58	1.01	1.56	0.04	0.04
Experiment Station Publications	10.90	14.35	28.62	33.07	0.88	1.50
Selected and Invited Papers	3.00	5.73	7.43*	17.47	0.45	0.49
Research Awards[d]	2.86	4.33	—	—	—	—
Number of Observations	41	191	36	155	41	189

[a]Includes all single and joint publications during faculty's career

[b]Career publications adjusted for 100% research appointment (only faculty with research appointments considered)

[c]Career publications ÷ years of professional experience

[d]Per-ten-faculty, includes departmental, college, university and professional research awards

*Means different at the $\alpha = .10$ level of significance (Student's t-test)

Babb). Three methods for computing the average productivity of faculty, shown in Table 1, include the following:

1. Career Average represents the total number of single and joint publications or papers during the faculty's career.
2. One Hundred (100) percent research average was computed by adjusting career publications to a 100 percent research appointment and limited to faculty with some research appointment.
3. Annual Average was computed by dividing the faculty's total career output by years of professional experience since earning their PhD degree.

When contrasted to the 191 faculty in other regions, the 41 faculty in the Northeast tended to have fewer publications, papers and research awards. However, Students t-tests for mean differences were not found to be statistically significant at conventional significance levels in all but one output category (selected and invited papers based on a 100 percent research appointment). These data suggest that faculty employed in the Northeast have experienced a level of research productivity which is equivalent to that experienced by faculty in other regions.

Average research productivity of agricultural economics faculty educated in the Northeast are shown in Table 2. The reader should note that these faculty are currently employed throughout the United States. When compared to the 198 faculty educated in other regions, the 34 faculty educated in the Northeast reported having fewer research outputs in all but one category (books). However, mean comparisons using Students t-tests found no statistically significant differences at conventional significance levels. These data would suggest that faculty who are educated in the Northeast appear to generate research outputs at a rate comparable to faculty educated in other regions.

Table 3 contrasts the research productivity of faculty who were educated in the Northeast and work in the Northeast with faculty who were educated in other regions and work in the Northeast. Hence the data in Table 3 give some indication of the advantages and disadvantages of being employed in one's region of education. Northeastern alumni who were employed in the Northeast generated lower levels of research output in all but one output category (selected and invited papers). Furthermore, a significantly lower level of output was found among Northeastern alumni in the number of papers in the American Journal of Agricultural Economics, books and research awards. When research output was adjusted for years of professional experience, no significant differences were found. These data suggest that the disadvantages of working in one's region of employment may only be a short-run phenomenon.

Table 2. Research Productivity of Agricultural Economics Faculty by Region of EDUCATION, 1979.

	Region of Education					
	Northeast	All Others	Northeast	All Others	Northeast	All Others
	faculty average					
Computed on Basis of:	Career[a]		100% Research[b]		Annual Average[c]	
Number of Papers In:						
Amer. J. Agr. Economics	1.06	1.90	2.49	4.24	0.10	0.13
Other National Journals	2.15	3.73	4.46	8.95	0.32	0.26
Foreign Journals	0.88	1.80	3.31	3.55	0.14	0.09
Regional Journals	1.59	2.07	3.99	5.35	0.21	0.20
Books	0.56	0.55	1.52	1.45	0.07	0.04
Experiment Station Publications	12.50	13.95	39.62	31.02	1.17	1.43
Contributed and Invited Papers	4.94	5.30	14.71	15.75	0.48	0.49
Research Awards[d]	0.57	4.68	—	—	—	—
Number of Observations	34	198	27	164	33	197

[a] Includes all single and joint publications during faculty's career

[b] Career publications adjusted for 100% research appointment (only faculty with research appointments considered)

[c] Career publications ÷ years of professional experience

[d] Per-ten-faculty, includes departmental, college, university and professional research awards

RESEARCH RESOURCES

General faculty characteristics were examined and an attempt was made to identify factors which influence research productivity. These general characteristics of faculty in the Northeast Region which were reported in a previous article (Broder, Ziemer and Gunter) have been estimated for all faculty in the Northeast and contrasted to faculty in other regions (see Appendix Table A.1). A summary of statistically significant differences in research resources are reported in Table 4 for each of the faculty categories presented in Tables 1, 2 and 3. The data in Table 4 generally indicate that faculty employed in the Northeast carried larger teaching appointments, had fewer non-teaching terms per year and spent more years as assistant professors than their counterparts who were employed in other regions.[2] A similar pattern was found among Northeastern alumni, with the exception of years as an assistant professor.

When faculty employed in the Northeast were contrasted by region of education, several significant differences were observed. When compared to faculty educated in other regions, Northeastern alumni generally had larger teaching appointments, fewer years of experience as full professors and lower salaries. Also, these faculty had more undergraduate advisees, fewer PhD level advisees, fewer graduate level courses and fewer non-teaching terms during the year.[3] The combination of these resource differences in Table 4 was thought partially to explain differences in research outputs in previous tables.

RESEARCH CONCENTRATION

Regional comparisons of research productivity based on average faculty statistics must be interpreted in light of differences in research concentration across regions. Otherwise, mean differences in research output across regions may be due to the presence or absence of highly published faculty. The extent to which a small number of highly published faculty may dominate a region's research output was measured using regional concentration ratios for research outputs. Adapted from industry concentration ratios and measured as a follow-up to previous studies (Nielson and Riley), regional concentration in

[2] Not reported in Table 4 are administrative and other components of faculty appointments. Because of these components, statistical differences in research or extension appointments may not be associated with statistical differences in teaching appointments.

[3] Some differences in the number and duration of non-teaching terms may be due to differences in school calendars across regions.

Table 3. Research Productivity of Agricultural Economics Faculty Employed in the Northeast, by Region of EDUCATION, 1979.

	Region of Education					
	Northeast	All Others	Northeast	All Others	Northeast	All Others
	----------faculty average----------					
Computed on Basis of:	Career[a]		100% Research[b]		Annual Average[c]	
Number of Papers In:						
Amer. J. Agr. Economics	0.44*	1.72	0.86**	4.12	0.07	0.17
Other National Journals	1.88	2.92	4.41	5.90	0.44	0.26
Foreign Journals	0.38	0.56	1.23	1.11	0.06	0.04
Regional Journals	1.31	2.36	3.36	6.94	0.33	0.21
Books	0.13*	0.66	0.57	1.31	0.03	0.05
Experiment Station Publications	7.06	13.36	19.35	34.52	0.64	1.04
Selected and Invited Papers	3.13	2.92	8.48	6.81	0.54	0.41
Research Awards[d]	0*	4.61	—	—	—	—
Number of Observations	15	25	13	22	15	25

[a]Includes all single and joint publications during faculty's career

[b]Career publications adjusted for 100% research appointment (only faculty with research appointments considered)

[c]Career publications ÷ years of professional experience

[d]Per-ten-faculty, includes departmental, college, university and professional research awards

*Means different at the α = .10 level of significance (Student's t-test)

**Means different at the α = .05 level of significance (Student's t-test)

research productivity measures the percentage of total publications in a region which is generated by the most published 10 and 20 percent of the faculty surveyed in that region.

To account for differences in the professional prestige of publications and to establish a concentration ratio with national implications, a system of weights was assigned to the publications shown in Table 1-3. Concentration ratios, shown in Table 5, were based on the following weighting scheme: book = 5; AJAE = 2; national, regional, foreign and international journals = 1; and experiment station and extension publications = 1/3. However arbitrary, these weights reflect the procedures and empirical findings of previous studies on economics faculty (DeLorme, Hill, Wood; Seigfried and White; Tuckman and Leahey). Hence the concentration ratios of Table 5 are based upon and should be interpreted in light of the above system of weights.

In terms of total career publications, the North Central Region experienced the greatest research output concentration with 10 and 20 percent of these faculty accounting for 62 and 72 percent of the publications in the North Central Region (Table 5). The Northeast Region ranked third among regions in concentration ratios. The top 10 and 20 percent of faculty in the Northeast accounted for 34 and 55 percent of the career publications produced in the Northeast. When concentration ratios were computed on the basis of annual average publications, the most published 10 and 20 percent of the faculty in the Northeast accounted for 28 and 45 percent of the annual publications in the Northeast.

In three of the four concentration ratio categories on Table 5, the Northeast Region ranked third among regions in research concentration. Since the data in Table A.1 failed to show any significant differences in the size of research appointments across regions, the concentration ratios in Table 5 tend to reflect research appointments of equal proportion and are generally thought to be comparable across regions. Hence, these data suggest that when compared to other regions, the Northeast Region appears to have experienced only moderate levels of research output concentration.

SUMMARY AND CONCLUSIONS

This paper has examined and contrasted the research productivity of academic agricultural economics faculty in the Northeast with that of faculty in other regions. The findings of this paper suggest that there are few significant differences in research outputs associated with faculty who are employed and/or who were educated in the Northeast. Some short-run differences in research productivity may have occured among North-

Table 4. Summary of Statistically Significant Mean Differences in Research Resources of Agricultural Economics Faculty, 1979 (Student's t-tests).

	Region of Employment[a]	
	Northeast	All Others
Number of Observations	42	199
% Female	4.76*	1.01
% Teaching Appointment	33.85**	26.50
Years Experience as Assistant Professor	4.26**	3.39
Non-teaching terms/year	0.90**	1.68

	Region of Education[b]	
	Northeast	All Others
Number of Observations	36	205
% Teaching Appointment	37.00***	26.17
Non-teaching terms/year	1.17**	1.61

	Region of Education[c]	
	Northeast	All Others
Number of Observations	16	26
% Female	12.50*	0.00
% Teaching Appointment	44.56**	27.27
Years Experience as Full Professor	1.56*	5.35
Annual salary	$27,107.00***	$32,918.00
Number of Advisees		
Undergraduate	20.38**	11.65
PhD	.43*	1.27
Number of Graduate Courses Taught[d]	1.15**	3.90
Non-teaching terms/year	0.50*	1.15

[a]All regions of education included, i.q. Table 1

[b]All regions of employment included, i.q. Table 2

[c]Faculty employed in Northeast Region only, i.q. Table 3

[d]Based on a 100% teaching appointment (only individuals with teaching appointments considered)

*Means different at the α = .10 level of significance

**Means different at the α = .05 level of significance

***Means different at the α = .01 level of significance

Table 5. Regional Concentration in Publications Among Agricultural Economics Faculty, 1979

Region[a]	Concentration Ratios[b]			
	Total Career Publications		Annual Average Publications	
	Top 10%	Top 20%	Top 10%	Top 20%
	----------percent of publications----------			
Northeast	34.39	54.70	28.38	45.38
South	28.44	49.95	25.74	47.17
North Central	62.32	74.20	46.02	61.05
Pacific	23.97	49.14	17.36	37.40
Mountain, Plains and Southwest	41.10	59.32	48.98	63.84

[a]For regional delineations see Peck and Babb

[b]Percentage of publications in region accounted for by most published 10 and 20 percent of faculty in region

eastern alumni who were employed in the Northeast. This paper found significant differences in some general faculty characteristics which were thought to influence research productivity. In particular, faculty from or in the Northeast tended to carry larger teaching loads and teach more terms during the year relative to faculty from or in other regions. An attempt was made to measure the degree to which average research output levels in the Northeast were due to a small group of highly published faculty in the region. No evidence was found to suggest that the Northeast region, relative to other regions, was overly dominated by a small gorup of highly published research faculty.

In closing, we did not attempt to ascertain the desirability of various measures of research productivity, nor did we intend to afford any special recognition to research productivity at the expense of teaching or extension productivity. Teaching and extension activities are sufficiently important and complex to warrant separate studies. Further research into alternative measures of faculty productivity is recommended to gain additional insights into the unique contributions and qualities of academic agricultural economists in the Northeast Region.

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APPENDIX Table A.1. Average Characteristics of Agricultural Economics Faculty Employed in the Northeast Region, 1979.

Characteristic			Region of Employment: Northeast	Region of Employment: All Others
Number of Observations			42	199
Age			42.71	44.06
Percent Female			4.76*	1.01
Faculty Appointment:	% Research		46.40	45.62
	% Teaching		33.85**	26.50
	% Extension		15.04	21.14
Years Experiences as:	Assistant		4.26**	3.39
	Associate		3.43	3.64
	Full		3.90	4.65
Salary:[a]	Assistant		$24,763.00	$23,833.00
	Associate		$30,056.00	$28,321.00
	Full		$37,235.00	$35,899.00
Annual Consulting Income			$ 2,072.00	$ 2,810.00
Percent Consulting			54.76	54.77
Annual Grants			$56,468.00	$67,693.00
Percent Obtaining Grants			69.05	57.28
Number of Career Employment Changes			0.86	0.86
Hours/week on Committees			3.52	3.69
Number of Student Advisees:	Undergraduate		14.98	12.74
	Masters		2.21	2.08
	PhD		0.95	1.33
Average Number of Courses Taught:[b]		Undergraduate	3.56	3.71
		Dual Level	1.86	2.19
		Graduate	2.85	2.90
Number of Non-teaching Terms[c]			0.90**	1.68

[a] Based on a 12-month contract

[b] Based on a 100% teaching appointment (only those with teaching appointments considered)

[c] During previous year

*Means different at the $\alpha = .10$ level of significance

**Means different at the $\alpha = .05$ level of significance