Journal of Agricultural Science; Vol. 8, No. 10; 2016
ISSN 1916-9752 E-ISSN 1916-9760
Published by Canadian Center of Science and Education

# Few Journal Article Organizational Structure Characteristics Affect Article Citation Rate: A Look at Agricultural Economics Articles Using Regression Analysis

Joe L. Parcell[1], Glynn T. Tonsor[2] & Jason V. Franken[3]

[1] Department of Agricultural and Applied Economics, University of Missouri, Columbia, MO, USA

[2] Department of Agricultural Economics, Kansas State University, Manhattan, KS, USA

[3] School of Agriculture, Western Illinois University, MaComb, IL, USA

Correspondence: Joe L. Parcell, Department of Agricultural and Applied Economics, College of Agriculture, Food and Natural Resources, University of Missouri, 200 Mumford, Columbia, MO 65201, USA. Tel: 1-573-882-0870. E-mail: parcellj@missouri.edu

Received: July 14, 2016 Accepted: August 26, 2016 Online Published: September 15, 2016

doi:10.5539/jas.v8n10p73 URL: http://dx.doi.org/10.5539/jas.v8n10p73

**Abstract**

When reporting research findings, a journal article's organizational structure influences whether others can easily assess the published research's procedures, interpret the results, and synthesize the implications. Organizational structure characteristics include sufficiently explained variables, data format, number of exhibits, and presence of an appendix. This study endeavors to empirically test whether journal article organizational structure influences citation rates. Citations are used for ranking academic fields, evaluating faculty for promotion, and assessing faculty performance for merit-based salary increases. Journal editors desire higher citation rates to enhance journal exposure, and faculty target publishing in journals with higher impact factors, which reflect citation rates. To assess whether journal article organization affects citation rates, this study uses data from a survey of 68 *Journal of Agricultural and Resource Economics* articles published between 1994 and 1998, and it uses citation rates between February 2010 and the publication date as the dependent variable. These articles were selected because they used regression methods and had all information necessary for this analysis. Using Tobit and truncated ordinary least squares regressions, this study evaluated the marginal effects of variables, including organizational structure characteristics, influencing citation rates. The results indicated a lack of statistical significance for most organizational structure variables affecting citation rates. The use of panel data use and presence of an appendix were the two only organizational structure variables that had significant effects on journal article organizational structure. They had respective positive and negative effects. Thus, little evidence supports that a professional impact, measured as citations, will result from at least this particular journal making efforts to improve article format structure. The current study may motivate future research that replicates the methods and examines other journals and article characteristics.

**Keywords:** article organization structure, citation rate, impact factor, publication frequency

## 1. Introduction

The frequency at which a particular journal article is cited within peer journal articles is used as a measure of impact for ranking academic and non-academic research fields and determining faculty promotions and merit-based pay raises (Hamermesh, Johnson, & Weisbrod, 1982; C. E. Hilmer & M. J. Hilmer, 2005; Kalaitzidakis, Mamuneas, & Stengos, 2003; Perry, 1994). Some journal articles become seminal research that stands the test of time. Others enter into obscurity soon after publication. Prior research identifies several factors that contribute to citation rates for agricultural economics journals, including author region, author status, article length, and article placement in the journal (e.g., Hilmer & Lusk, 2009; Lusk & Hudson, 2009; Petrolia & Hudson, 2013). One previously unexamined factor that seemingly may influence citation rates is an article's organizational structure. For purposes of this study, organizational structure refers to the components that a researcher chooses to share in a journal article – those include data format, variable explanation, equations, exhibits, appendices, and interpretation – and their presentation and format. It impacts the ease at which other researchers can assess the procedures, interpret the results, and synthesize the implications from published

research. This study's objective is to empirically test whether journal article organizational structure affects citation rate.

The reader's ability to assess implications of research results depends on the author's ability to explain procedures, extract generalities, and quantify effects. If the reader cannot clearly follow the author's outline, which is a product of the journal article's organizational structure, then the research's value is reduced greatly because overarching implications will likely be missed and replicating results will undoubtedly be more difficult. Tomek (1993) has suggested that research confirmation and replication involve a quality-quantity trade-off. Ladd (1991, p. 8) noted, "When I was a student, we were taught replication was a necessary process". Surely, making research easier to confirm and replicate improves quality, perhaps without loss of quantity.

We believe several stakeholders stand to benefit if relationships between an article's organizational structure and its citation rate can be identified. Citation rates are components of journal impact factors. Thus, enhancing citation rates would appeal to journal editors who desire to increase a journal's exposure and improve its academic stature. If organizational structure affects citation rates, then editors are likely to accept journal articles that follow structures thought to lead to increased citation rates. Additionally, journal reviewers and editors could provide authors more constructive and consistent feedback about preferred article formats. Similarly, researchers could better control their ability to effectively organize, describe, and synthesize research findings. Understanding if and which organizational factors contribute to higher citation rates is important for researchers as they seek to share their work and have it be referenced by others in the research community.

The present study assesses whether journal article organizational structure affects article citation rates using data from a survey of 68 *Journal of Agricultural and Resource Economics* (*JARE*) articles that Parcell et al. (2000) used to determine best publication practices and consistency in methodologies, reporting practices, and clarity presented in published journal articles. As reported by Parcell et al. (2000), their survey measures of organization style and structure included the type of data analysis, use of simulation, results interpretation, and results presentation. The survey data provide a base for assessing the impact of organizational structural factors on citation rates for these articles between the publication date and through 2010. This paper proceeds with summarizing related literature and describing the data and modeling procedures employed for the current study. Then, empirical results are reported.

## 2. Material Studied and Methods

### *2.1 Previous Research*

Several literature materials about citation rates and factors that influence them guided this research. Citations play an important role in measuring the impact of institutions, departments, programs, and individuals (e.g., Kalaitzidakis et al., 2003; Kim, Morse, & Zingales, 2006). Individuals' citation rates are used to determine promotion decisions, salaries, and research awards (Hamermesh et al., 1982; Moore, Newman, & Turbull, 1998; Siow, 1991). Academic economists' salary adjustments are larger for a citation than for a publication (Hamermesh et al., 1982).

With respect to factors affecting citation rates, Ellison (2002) analyzed economics journals from 1970 to 1998 and determined that citation rates for second-tier and general interest journals had eroded. He also found a positive relationship between review time and citation rates. Laband and Tollison (2006) reviewed citation rates five years following publication for 73 journals in 1974 and 91 journals in 1996. Five years out, 26 percent of articles had no citations, and more than 85 percent of articles had fewer than 10 citations. They concluded that much of academic research is a wasted effort.

Although reader fatigue also may be expected to increase with the number of pages in an article, previous research finds that citations tend to increase with article length, which may reflect more content in longer papers (Hilmer & Lusk, 2009; Hudson, 2007; Laband & Tollison, 2006; Medoff, 2003). Both Hudson (2003) and Medoff (2003) found that the number of authors had no impact on citation rate, but Hudson (2007) found a lead author regional bias. Hudson (2007) also found a positive relationship between self-citations and non-self-citations attributable to an *advertising* effect and evidence of positive externalities from highly cited articles. Thus, accompanying articles from the particular volume also had higher citation rates. Several studies find that self-citations significantly increase either total citations or other non-self-citations (Hilmer & Lusk, 2009; Hudson, 2007; Laband & Tollison, 2006). Similarly, each of those previous several studies finds evidence that citation rates vary over time.

Laband and Tollison (2006) studied author order in the *American Economic Review* and *American Journal of Agricultural Economics*. They found that alphabetized two-author papers received more citations than

non-alphabetized two-author papers in both journals and concluded that a preponderance of non-alphabetized papers in agricultural economics, compared to economics, may reflect the importance of nonmarket-based criteria to evaluate research in the former field. Both Hilmer and Lusk (2009) and Hudson (2007) found that the first article listed in each edition of a journal tends to garner more citations.

Hilmer and Lusk (2009) investigated citation rates in the *American Journal of Agricultural Economics* and the *Review of Agricultural Economics*. They considered whether internet technology affects citation rates by capturing citation rates following publication in 1991, 1993, 2001, 2003, and 2005, but they detected no such effect. They found that, on average, about 11 percent of articles in the *American Journal of Agricultural Economics* and nearly 50 percent of articles in the *Review of Agricultural Economics* had zero citations. Even so, the top-cited *Review of Agricultural Economics* article in their dataset still had more citations than 93 percent of the *American Journal of Agricultural Economics* articles analyzed. Tobit regression results indicated that lead article status, self-citations, and immediate citations within a year of publication had the largest positive impacts on non-self-citation rates. Article page length also had a significantly positive effect. Proceedings papers and comments/replies were cited less often, and no significant effect was ascertained for the number of authors or equations nor for dummy variables measuring whether an author was an AAEA fellow, at a top-tier school, or at a U.S. school or abroad. Hilmer and Lusk (2009) also examined whether author status as an AAEA fellow increased citation rates, but they found no effect.

Based on the previous research, citations have the potential to influence researcher careers, and for published journals, several factors tend to affect article citation rates. Those include page length, time since research paper publication, lead article status, and self-citations. Given this background, the current research builds on the literature and considers whether organizational structure characteristics support or inhibit a higher citation rate for journal articles published in the agricultural economics literature.

### *2.2 Research Design, Data Collection, and Analysis*

The current study used data from a survey of *JARE* articles published between 1994 and 1998. Parcell et al. (2000) previously examined these same studies to determine best practices and consistency regarding methodologies, reporting practices, and clarity of published journal articles that had used regression procedures as a component of their methodologies. Of the 151 articles published in *JARE* during that period, 86 used regression analysis. Of those 86 articles, 68 also contained full information necessary for the current analysis. As a result, this study based its analysis on that subset of the 68 journal articles.

Questions posed in the Parcell et al. (2000) study were adapted from survey questions used by McCloskey and Ziliak (1996) to study articles employing regression analysis and published in the *American Economic Review* articles using regression analysis. The Parcell et al. study asked 25 questions for each journal article. Questions were stated such that the surveyor could respond with a "yes" to represent that the authors do this or report this, a "no" to represent that the authors do not do this or do not report this, and "not applicable" to represent that the question asked was not applicable to the article.

The survey data provided the base for our analysis, which was supplemented with annual citation data collected from Publish or Perish (Harzing, 2007). For each article, annual citation data were gathered for the time between a given article's publishing date, e.g., sometime between 1994 and 1998, and February 2010. Similarly, data on self-citations were collected and aggregated across years. The remainder of the data for analysis in the current study was provided by Parcell et al. (2000).

Table 1 reports summary statistics for the 151 articles (2,294 pages) published in *JARE* from 1994 through 1998 and the subsample of 68 articles (896 pages) that complete the data for the current study. That is, the papers examined in the current study account for approximately 45 percent of the articles and 39 percent of the pages published in *JARE* during that period. Articles varied in length from eight pages to 20 pages. For the papers that used regression, the citation rate averaged 21.6 citations per article. Overall, about 14 percent of the reported citations were self-citations by the lead author.

Table 1. Summary statistics of surveyed articles that were published in the *Journal of Agricultural and Resources Economics* between 1994 and 1998 and used regression analysis

| Variable | 1994 | 1995 | 1996 | 1997 | 1998 | All Years |
|---|---|---|---|---|---|---|
| Total articles published ($n$ = 151) | 32 | 26 | 30 | 27 | 36 | 151 |
| Total pages published ($n$ = 151) | 463 | 410 | 418 | 426 | 578 | 2,294 |
| Articles using regression ($n$ = 86) | 22 | 12 | 22 | 16 | 14 | 86 |
| Current Study ($n$ = 68) | | | | | | |
| Percent of total articles published | 62.5 | 34.6 | 53.3 | 48.1 | 27.8 | 45.0 |
| Total pages reviewed | 251 | 122 | 212 | 168 | 143 | 896 |
| Percent of pages published | 54.2 | 29.8 | 50.1 | 39.4 | 24.7 | 39.1 |
| Shortest paper (pages) | 8 | 11 | 10 | 8 | 9 | 8 |
| Longest paper (pages) | 17 | 18 | 16 | 17 | 20 | 22 |
| Average number of citations | 25.8 | 20.2 | 18.5 | 22 | 18.8 | 21.6 |
| Average percent citations by the lead author | 12.8 | 12.1 | 17.5 | 8.7 | 21.2 | 14.0 |

*Note*. In total, the *Journal of Agricultural and Resource Economics* published 151 articles between 1994 and 1998. Of those, 86 articles used regression analysis and 68 of the articles are used for the current analysis.

The distribution of citations and lead author self-citations is shown in Figure 1. Most journal articles received between 0.5 and 2.5 citations per year on average. A majority of those citations were not self-citations (Figure 1). Little correlation existed between number of citations and year published (< 0.14 in absolute value), first 100 pages (0.02), number of co-authors (0.07), or article length (0.18). As expected, number of co-authors and number of self-citations exhibited positive correlation (0.15).

Conceptually, the number of citations for a journal article may be modeled as dependent on a number of factors in a regression framework, as indicated by Equation 1:

$$\begin{aligned} &\textit{Citations} = f(\textit{number of co-authors, rank of lead author, self-citations by lead author, year published,} \\ &\textit{lead article, first 100 pages, number of pages, type of data format, econometric model,} \\ &\textit{number of goodness of fit measures, sufficiently explained dependent variable, degrees of freedom reported,} \\ &\textit{statistical and economic significance both reported, simulation was used, number of equations,} \\ &\textit{number of exhibits, appendix present)} \end{aligned} \quad (1)$$

Table 2 summarizes explanatory variable descriptions and the expected relationship between each explanatory variable and the dependent variable. Many of the variables listed early in Equation 1 do not pertain to article organizational structure, but prior studies included them as variables that may impact citation rates. Several variables broadly relate to article organization, which may influence the chance for future citation. A binary variable was used to measure whether an article sufficiently explains its dependent variable and enables readers to easily discern the factor being analyzed. Degrees of freedom is a binary variable was used to indicate whether readers can assess statistical and economic significance. The power of the test is limited by degrees of freedom because it's based on sample size. Hence, reporting the number of observations is expected to be positively related to total citations. Whether the author reported economic significance in addition to statistical significance is represented by a binary variable. Describing economic significance is expected to have a positive statistical relationship with the total number of article citations. Whether or not simulation was used is also recorded as a binary variable.

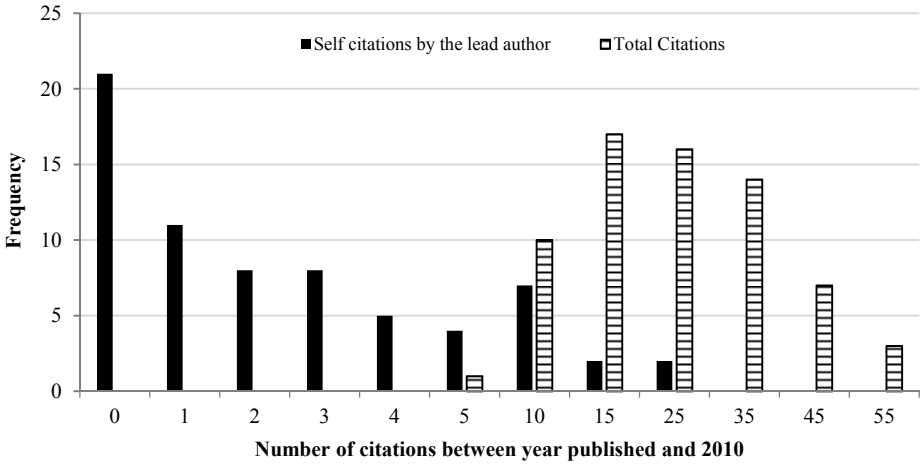


Figure 1. Distribution of citations and lead author self-citations for 68 journal articles published in the JARE between 1994 and 1998

*Note*. Of the journal articles studied for this analysis, most journal articles received between 0.5 and 2.5 citations per year on average. A majority of those citations were not self-citations. Articles with less than 5 citations and more than 55 citations were eliminated from the data to filter outliers.

Three variables refer to the level of detail provided in a journal article. A positive relationship is expected for total journal article citations and the number of equations and exhibits included, and a binary measure was used to indicate presence of an appendix. The number of goodness-of-fit measures shared (e.g., $R^2$, adjusted $R^2$, root mean squared error, log likelihood) is expected to have a positive effect on citation rates. A series of binary variables accounted for type of data format: time series, cross-sectional, or panel (*default* = panel). Additionally, binary variables were used to record the type of econometric model: ordinary least squares (OLS), limited dependent variable, or system (*default* = OLS).

Several other factors, not particularly linked to organizational structure, were assessed by the current study. Although the number of co-authors may be expected to have a positive effect on citations if greater collaboration generally leads to more valuable research or more self-citations and later *advertising* of the paper, previous research has found no such effect. Here, the rank of lead author is distinguished as non-academic, graduate student, assistant professor, associate professor, professor, and other (non-tenure track) academic (*default*). Among academicians, more seasoned, and perhaps better known, authors are expected to garner more citations, as experience and credentials likely translate into greater value as measured by impact on the profession.

A higher number of self-citations by the lead author is expected to positively affect the total number of citations. This variable is included to control for specific authors building a research portfolio on their prior research efforts, and it may also reflect *advertising* effects. The research accounted for publication year with a series of 0 or 1 binary variables (*default* = 1994) to capture fixed effects of some articles having been published longer than other articles.

Like suggested in the literature, article placement in a journal can influence citations. Because only three lead articles in our sample of papers both used regression procedures and qualified for the analysis, the analysis examined whether papers published in the first 100 pages (a 0 or 1 binary variable) had greater citation rates. Such an effect may reflect prestige or reader fatigue. For this research, number of pages is expected to be positively related to citation rates.

Table 2. Explanatory variable definitions and expected sign of impact

| Variable | Definition | Expected sign |
|---|---|---|
| Number of authors | | (+) |
| Rank of lead author | (binary variables: 1 = yes, 0 = no; default = other academic, e.g., non-tenure track) | |
| Graduate student | | (-, ?) |
| Assistant | | (-) |
| Associate | | (?) |
| Professor | | (+) |
| Non-academic | | (?) |
| Self-citations | Article citations by lead author | (+) |
| Year article was published | (binary variables: 1 = yes, 0 = no; default = 1994) | |
| 1995 | | (-) |
| 1996 | | (-) |
| 1997 | | (-) |
| 1998 | | (-) |
| First 100 pages | (binary variable: 1 = yes, 0 = no) | (+) |
| Number of pages | | (+) |
| Data format | (binary variables: 1 = yes, 0 = no ; default = time series) | |
| Cross-sectional | | (?) |
| Panel | | (?) |
| Regression technique | (binary variables: 1 = yes, 0 = no ; default = OLS) | |
| Limited dependent variable | | (?) |
| System of equations | | (?) |
| Number of goodness of fit measures | | (+) |
| Sufficiently explained dependent variable | | (+) |
| Degrees of freedom reported | (binary variable: 1 = yes, 0 = no) | (+) |
| Statistical and economic significance explained | (binary variable: 1 = yes, 0 = no) | (+) |
| Simulation used | (binary variable: 1 = yes, 0 = no) | (+) |
| Number of equations | | (+) |
| Appendix present | (binary variable: 1 = yes, 0 = no) | (+) |
| Number of exhibits | | (+) |

*Note*. In most cases, organizational structure characteristics were expected to have a positive influence on citations. However, in some cases, there was uncertainty about the expected sign. Overall, variables expected to have a negative sign of impact were graduate student and assistant professor as lead author and year published.

Other variables were considered for inclusion in estimation of the model specified in equation 1. Author institutional affiliation was considered, but many of the articles included co-authors with multiple affiliation. Sample size would not allow for us to consider every affiliation. An external reviewer suggested two other variable including frequency of author publishing in the journal and then an acknowledgment affect, e.g., granting agency. We agree that frequency of author publishing is the same journal is interesting, but this variable could be highly correlated with self-citations of the lead author already accounted for in the model. As for an acknowledgement affect, most agricultural economists of the mid 1990s had research funded through experiment station Hatch Act funding from USDA. Grant funded research was less common at the time. Persons wishing to replicate this study with newer data could consider an acknowledgement affect.

To make the assessment about whether organizational structure variables and other factors influence citation rate, we considered several data analysis techniques. Presented models were chosen based on model appropriateness (i.e., normality of residuals) and to facilitate comparison to prior research on factors influencing citation rates. For instance, Laband and Tollison (2006) examined total citation rates as a function of self-citations and other variables using ordinary least squares (OLS) regression, and Hilmer and Lusk (2009) used Tobit models to assess similar effects on total-self citations. Given that self-citations are a component of total citations, we also

considered models of total citations excluding self-citations as an explanatory variable. The *p*-values from Shapiro-Wilk tests applied to model residuals indicate that the null hypothesis of normality is rejected more often for Tobit models than for truncated OLS. The smaller sample size of 68 observations, of the 86 total available, reflects that outliers of less than or equal to four total citations and greater than or equal to 55 total citations are dropped to arrive at models for which the null hypothesis of normal residuals could not be rejected. Pseudo $R^2$ values indicate that little of the variation in citation rates is explained by the model, but no corresponding measure is available for truncated OLS. Fairly low $R^2$ values are also reported in prior citation rate studies (Hudson, 2007; Laband & Tollison, 2006).

## 3. Results and Discussion

The results indicate a lack of statistical significance for organizational structure variables influencing journal article citation rates (Table 3). Of those variables evaluated, only the use of panel data and the presence of an appendix had significant effects as assessed in the Tobit and truncated OLS regressions. For panel data, the variable was significant at the 10 percent level in the truncated OLS regression. Panel data's positive effect seems intuitive given that such data may allow researchers to better address some statistical issues than when only time-series or cross-sectional data were available. The negative effect of an appendix, however, is less easy to explain. It had statistical significance at the 5 percent level in the Tobit analysis. Perhaps, authors over use appendices as an easy fallback mechanism when they find it difficult to adequately explain complexities within the text. Such a possibility would be consistent with some degree of disorganization, which could confuse readers and subsequently lead to lighter citation of such papers.

Because most organizational structure characteristics were not significantly linked to influencing journal article citation rates, findings from the current analysis offer little evidence that a professional impact, measured as citations, may be expected to accrue from efforts to improve journal article organizational structure. Furthermore, at least for the journal analyzed, the editorial team could not expect to gain much in terms of impact factors, which are rooted in citations, from adopting a standardized organizational format.

Table 3. Marginal effects of Tobit and truncated OLS regressions

| | Tobit | | | Truncated OLS | | |
|---|---|---|---|---|---|---|
| | Total Citations | | Total-Self Citations | Total Citations | | Total-Self Citations |
| Number of Authors | -0.03 | -0.03 | -0.03 | 0.99 | 0.90 | 1.55 |
| | (1.48) | (1.54) | (1.48) | (2.13) | (2.26) | (2.95) |
| Assistant | 2.14 | -0.64 | 2.14 | -0.87 | -4.41 | 0.43 |
| | (4.31) | (4.29) | (4.31) | (6.30) | (6.44) | (8.64) |
| Associate | 0.05 | -1.91 | 0.05 | -7.80 | -10.20 | -6.66 |
| | (5.55) | (5.69) | (5.55) | (8.53) | (9.01) | (11.41) |
| Professor | -2.26 | -2.43 | -2.26 | -8.08 | -7.66 | -7.51 |
| | (4.51) | (4.68) | (4.51) | (6.88) | (7.06) | (9.09) |
| Grad Student | -7.03 | -7.68 | -7.03 | -14.97* | -15.85* | -16.78* |
| | (5.71) | (5.92) | (5.71) | (8.93) | (9.46) | (13.40) |
| Non Academic | 13.25** | 10.36* | 13.25** | 12.61 | 9.57 | 16.15 |
| | (5.67) | (5.74) | (5.67) | (7.91) | (8.08) | (10.50) |
| Self-Citations | 0.85** | - | -0.15 | 1.02** | - | -0.54 |
| | (0.37) | | (0.37) | (0.52) | | (0.78) |
| 1995 | -10.37** | -11.33** | -10.37** | -17.90*** | -19.88*** | -23.94*** |
| | (4.67) | (4.82) | (4.67) | (6.92) | (7.34) | (9.74) |
| 1996 | -6.94* | -7.25* | -6.94* | -15.55*** | -15.93** | -18.67** |
| | (3.72) | (3.86) | (3.72) | (6.04) | (6.32) | (8.48) |
| 1997 | -3.63 | -4.24 | -3.63 | -7.94 | -8.92 | -10.39 |
| | (4.19) | (4.34) | (4.19) | (5.72) | (6.00) | (7.56) |
| 1998 | -11.62** | -10.89** | -11.62** | -15.86** | -14.99** | -21.30** |
| | (4.75) | (4.91) | (4.75) | (7.07) | (7.32) | (10.27) |
| First 100 pages | -5.14 | -3.86 | -5.14 | -9.74* | -8.49 | -11.94 |
| | (3.85) | (3.95) | (3.85) | (5.66) | (5.80) | (7.73) |

| | | | | | | |
|---|---|---|---|---|---|---|
| Pages | 0.87 | 1.15* | 0.87 | 0.55 | 0.94 | 0.85 |
| | (0.63) | (0.64) | (0.63) | (0.95) | (0.97) | (1.29) |
| Cross-Section | 1.10 | -1.82 | 1.10 | 1.64 | -2.14 | 3.89 |
| | (4.51) | (4.49) | (4.51) | (6.74) | (6.91) | (9.33) |
| Panel | 4.69 | 4.29 | 4.69 | 11.81* | 11.50* | 15.80* |
| | (4.13) | (4.28) | (4.13) | (6.43) | (6.76) | (9.48) |
| LDV | 1.19 | -1.17 | 1.19 | 1.80 | -1.59 | 1.08 |
| | (4.36) | (4.39) | (4.36) | (6.21) | (6.32) | (8.46) |
| SYS | 1.98 | -1.35 | 1.98 | 3.50 | -1.05 | 4.28 |
| | (3.92) | (3.78) | (3.92) | (6.00) | (5.85) | (8.74) |
| Fit Statistics | 1.71 | 0.50 | 1.71 | 2.36 | 1.00 | 2.51 |
| | (2.49) | (2.53) | (2.49) | (3.45) | (3.59) | (4.83) |
| Explain Dep Var | -0.55 | -2.12 | -0.55 | 2.52 | -0.68 | 0.64 |
| | (4.98) | (5.12) | (4.98) | (7.64) | (7.76) | (10.88) |
| DOF | 0.54 | 1.24 | 0.54 | 3.32 | 4.23 | 4.31 |
| | (2.98) | (3.08) | (2.98) | (4.24) | (4.41) | (5.92) |
| Significance | -3.05 | -3.85 | -3.05 | -4.95 | -5.89 | -6.68 |
| | (3.65) | (3.77) | (3.65) | (5.21) | (5.51) | (7.13) |
| Simulation | 2.55 | 2.86 | 2.55 | 5.03 | 5.25 | 5.54 |
| | (3.71) | (3.84) | (3.71) | (5.59) | (5.80) | (7.67) |
| Equations | -0.17 | -0.17 | -0.17 | -0.17 | -0.14 | -0.17 |
| | (0.21) | (0.22) | (0.21) | (0.31) | (0.32) | (0.43) |
| Appendix | -10.82** | -11.13** | -10.82** | -7.32 | -7.32 | -10.72 |
| | (4.76) | (4.93) | (4.76) | (7.92) | (8.41) | (11.23) |
| Exhibits | -0.85 | -1.10 | -0.85 | -1.50 | -1.93 | -2.14 |
| | (1.20) | (1.24) | (1.20) | (1.83) | (1.93) | (2.63) |
| $R^2$ | 0.06 | 0.05 | 0.05 | - | - | - |
| Shapiro-Wilk Test of Normality of Residuals, P-value | 0.042 | 0.177 | 0.048 | 0.240 | 0.052 | 0.237 |

*Note*. N = 68, *, **, *** denote statistical significance at 10%, 5%, 1% levels, respectively.

Of the organizational structure variables evaluated, only the use of panel data and the presence of an appendix had significant effects as assessed in the Tobit and truncated OLS regressions.

Consistent with expectations, the truncated OLS results provide some evidence that papers with graduate student lead authors garner fewer citations than those that have other (i.e., non-tenure track) academic researchers as lead authors (the default category) (Table 2). In comparison, the Tobit results suggested that articles with non-academic researchers as lead authors received relatively greater citation rates. Both Tobit and truncated OLS models indicated fewer citations for papers published in years following 1994 (the default year), which may partly reflect additional citations with the passage of time. Both models were also in agreement that self-citations have significantly positive effects on total citations, but this is not surprising given that the former is a component of the latter. In fact, given this point, it may be more appropriate to exclude self-citations from the model of total citations and used as the dependent variable total-self citations. For such a specification, the Tobit results seem more fitting than the truncated OLS results, as indicated by tests of normality of the residuals. In that case, the Tobit model indicates a positive effect of article length (i.e., pages) that is consistent with prior findings (Hilmer & Lusk, 2009; Hudson, 2007; Laband & Tollison, 2006). In contrast with prior findings of lead papers garnering greater citation rates (Hilmer & Lusk, 2009; Hudson, 2007), our truncated OLS results show some evidence of lower total citations for articles placed closer to the front of publications. Also contrary to the findings of Hilmer and Lusk (2009) and Hudson (2007), self-citations do not have a statistically positive impact on total-self citations in our results.

## 4. Conclusions

We had expected that characteristics of journal article organizational structure would influence citation rates. However, the results here suggest that journal article organizational structure has seemingly little overall impact

on citation rates for the particular journal analyzed. To arrive at this conclusion, this research analyzed the effects of journal article organizational structure on subsequent citation rates. The analysis used journal article organizational data for 68 *Journal of Agricultural and Resource Economics* articles from 1994 to 1998 and citation rates for subsequent years through February 2010. Based on Tobit and truncated OLS regressions, panel data use and presence of an appendix were the two only organizational structure variables that had significant effects on journal article organizational structure. They had respective positive and negative effects. Other organizational structure variables tested in the regression and found to not have a statistically significant effect on citation rates included the number of exhibits, whether variables were sufficiently explained, number of degrees of freedom, whether economic significance was reported, number of equations, number of goodness-of-fit measures, and type of econometric model used.

In addition to evaluating journal article organizational structure's effect on citation rates, the research also considered whether other variables influence citation rates. Other variables included number of authors, rank of lead author, time since original publication, number of pages, and article placement in first 100 journal pages. Consistent with previous work, some evidence suggests that longer articles, presumably with greater content, are cited more frequently, and that publication date influences citation rates, which may partly reflect more citations with the passage of time. The lead author's status (e.g., graduate student, other academic, non-academic) may also influence citation rates.

This study has a few limitations. First, observations are limited to articles that used regression analysis, and as a result, it analyzes a relatively small sample size. Of the 151 total articles published during the sample period of 1994 through 1998, just 86 used regression analysis and only 68 were used for the current study. This study also did not account for school quality of the lead author or citations appearing in the year immediately following publication, but those variables have been shown to positively impact citation rates. Hence, future research could include these variables and utilize larger samples and different types of journals when revisiting the importance of journal article organizational structure for citation rates.

**References**

Ellison, G. (2002). The Slowdown in the Economic Publishing Process. *Journal of Political Economy, 110*(5), 947-93. http://dx.doi.org/10.1086/341868

Hamermesh, D. S., Johnson, G. E., & Weisbrod, B. A. (1982). Scholarship, Citations, and Salaries: Economic Rewards in Economics. *Southern Economic Journal, 49*(2), 472-81. http://dx.doi.org/10.2307/1058497

Harzing, A. W. (2007). *Publish or perish*. Retrieved from http://www.harzing.com/pop.htm

Hilmer, C. E., & Hilmer, M. J. (2005). How Do Journal Quality, Co-authorship, and Author Order Affect Agricultural Economists' Salaries? *American Journal of Agricultural Economics, 87*(2), 509-23. http://dx.doi.org/10.1111/j.1467-8276.2005.00738.x

Hilmer, C. E., & Lusk, J. L. (2009). Determinants of Citations to the Agricultural and Applied Economics Association Journals. *Review of Agricultural Economics, 31*(4), 677-694. http://dx.doi.org/10.1111/j.1467-9353.2009.01461.x

Hudson, J. (2007). Be Known by the Company You Keep: Citations – Quality or Chance. *Scientometrics, 71*(2), 231-8. http://dx.doi.org/10.1007/s11192-007-1671-6

Kalaitzidakis, P., Mamuneas, T. P., & Stengos, T. (2003). Rankings of Academic Journals and Institutions in Economics. *Journal of the European Economic Association, 1*(6), 1346-66. http://dx.doi.org/10.1162/154247603322752566

Kim, E., Morse, A., & Zingales, L. (2006). What Has Mattered to Economics since 1970. *Journal of Economic Perspectives, 20*(4), 189-202. http://dx.doi.org/10.1257/jep.20.4.189

Laband, D., & Tollison, R. (2006). Alphabetized Coauthorship. *Applied Economics, 38*(14), 1649-53. http://dx.doi.org/10.1080/00036840500427007

Ladd, G. W. (1991). Thoughts on Building an Academic Career. *Western Journal of Agricultural Economics, 16*(1), 1-10.

Lusk, J. L., & Hudson, M. D. (2009). Submission Patterns, Submission Policies, and Revealed Preferences for Agricultural Economics Journals. *Review of Agricultural Economics, 31*, 695-711. http://dx.doi.org/10.1111/j.1467-9353.2009.01462.x

McCloskey, D. N., & Ziliak, S. T. (1996). The Standard Error of Regression. *Journal of Economic Literature, 34*, 97-114.

Medoff, M. H. (2003). Collaboration and the Quality of Economics Research. *Labour Economics, 10*(5), 597-608. http://dx.doi.org/10.1016/s0927-5371(03)00072-1

Moore, W. J., Newman, R. J., & Turnball, G. K. (1998). Do Academic Salaries Decline with Seniority? *Journal of Labor Economics, 16*(2), 352-66. http://dx.doi.org/10.1086/209892

Parcell, J. L., Kastens, T. L., Dhuyvetter, K. C., & Schroeder, T. C. (2000). Agricultural Economists' Effectiveness in Reporting and Conveying Research Procedures and Results. *Agricultural and Research Economics Review, 29*(2), 173-82.

Perry, G. M. (1994). Ranking M.S. and Ph.D. Graduate Programs in Agricultural Economics. *Review of Agricultural Economics, 16*(2), 333-40. http://dx.doi.org/10.2307/1349473

Petrolia, D. R., & Hudson, D. (2013). Why Is the Journal of Agricultural & Applied Economics Not in the Major Citation Indices and Does It Really Matter? *Journal of Agricultural and Applied Economics, 45*(3), 381-388. http://dx.doi.org/10.1017/s1074070800004910

Siow, A. (1991). Are First Impressions Important in Academia? *The Journal of Human Resources, 26*(2), 236-55. http://dx.doi.org/10.2307/145922

Tomek, W. G. (1993). Confirmation and Replication in Empirical Econometrics: A Step toward Improved Scholarship. *American Journal of Agricultural Economics, 75*, 6-14. http://dx.doi.org/10.1093/ajae/75_special_issue.6