

# Poetry in Economics

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## Abstract

Is economics an art? I address this old, but important, question empirically by examining the impact of rhetorical features of the titles of published economics articles on the ultimate success of these articles, as measured by their cumulative citations over the six-year period following their publication. Twenty eight percent of articles in the sample have a fresh figure of speech in their title. Surprisingly, adding a rhetorical device to the title of an empirical article adds more than four citations to the article's "lifetime" count, which represents about twenty percent of the lifetime citations of the average empirical article. This result testifies to the continuing power of rhetoric and poetry in economic science. (JEL B41 A14)

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Fact and logic are important parts of economic science. But are rhetoric and poetry important parts also? Being the arts of persuasion and sometimes ornament, they may seem to some to be obstacles to turning economics into a hard science. However, economists do employ rhetorical devices in their research. Labor economists speak of “human capital,” macroeconomists of “golden rules,” and microeconomists of “games” with equilibria that “perfect” but not “proper,” sometimes without even realizing that these are metaphors, because they have grown so accustomed to using them.

But what is the importance or significance of metaphors and other poetic devices in economics? In this paper, we seek to quantify their importance. We analyze the impact of rhetorical devices in the titles of published economics articles on the ultimate success of these articles, as measured by their cumulative citations over the six-year period following their publication. Titles are the most concise summaries of articles, and they often contain fresh figures of speech. For example, George Akerlof [1970] introduced the “lemons” metaphor into the economic literature on commodity markets in the title of his seminal article, “The Market for ‘Lemons’: Quality, Uncertainty and the Market Mechanism.”

In the empirical analysis, we regress article productivity on a dummy variable indicating whether the article’s title contains a poetic device. In the sample, thirty percent of theoretical articles, and twenty five percent of empirical articles, have a fresh poetic device in the title. Although theoretical economists use these rhetorical devices more often, they are more productive in empirical articles than in theoretical ones. In fact, they are detrimental to the productivity of published theoretical articles, but substantially conducive to that of published empirical articles. Adding a poetic device to the title of an empirical article adds more than four citations to the article’s “lifetime” count, which represents about twenty percent of the lifetime citations of the average empirical article. The findings testify to the

prevalence and significance of rhetoric and poetry in economic science.

In the regression analysis, we control for numerous characteristics of an article, other than the poetry of its title, which may also affect its productivity. These include whether the author received a grant for the underlying research, the ranking of the author's department, the author's career citations to date, the article's length, and whether it has a mathematical appendix (if it is a theoretical article). Controlling for these other characteristics makes the estimated effect of poetic titles on article productivity more precise. But the estimated effects of these other characteristics on productivity may also be useful to editors (and possibly authors) in their efforts to publish articles that will be highly cited.

## 1. Evidence of Poetry in Economics

For the period 1992-96, data was gathered from JSTOR on all single-authored papers (but not comments or communications) in regular issues of the American Economic Review (AER), Journal of Political Economy (JPE), and Quarterly Journal of Economics (QJE), widely regarded as three of the leading refereed, general-interest journals in economic science. This produced a sample of 268 papers. For each paper in the sample published in year  $t$ , data on citations by other authors to that paper in years  $t + 1$  to  $t + 6$  was gathered from the Social Science Citation Index (SSCI). Cumulative citations over the six year period after publication is the measure of an article's performance.

Each paper's title was classified according to whether it contains a poetic device (figure or speech) or whether it is purely informative. For example, "Digging for Golden Carrots" (Taylor, 1995), contains a metaphor, "Ants, Rationality, and Recruitment" (Kirman, 1993), a personification, "The Optimality of Myopic Behavior" (Leahy, 1993), an oxymoron, "Competing Head-to-Head May be Less Competitive" (Klemperer, 1992), a synecdoche, "Warm-

Glow Versus Cold-Prickle” (Andreoni, 1995), an antithesis, “Would Harassing Drug Users Work?” (Lee, 1993), a rhetorical question, and “Measurement Matters” (Belongia, 1996), an alliteration.<sup>2</sup> On the other hand, “A Solution to the Problem of Externalities When Agents are Well-Informed” (Varian, 1994) is an example of a title classified as purely informative rather than poetic.

A paper also bears the name of its author, who has a reputation, as well as a degree of skill, out of which the article was made. A more able author may produce inherently higher-quality papers, or may have acquired fame and a greater audience. To account for these factors, each author’s citations by other scholars in year  $t$  was compiled from the SSCI.

A paper also sports the names of the author’s institution and the journal that published it, each of which also have a reputation. Thus, authors were classified according to whether they belonged to an economics department, or were in business or government; and economics departments were further classified according to the world ranking reported in Kalaitzidakis *et al* (2003).<sup>3</sup> Indicator variables for each journal are also employed in the formal estimation.

Research in some fields of economics may be more cited than research in others. Thus, a paper’s JEL classification is recorded. Similarly, empirical research may be more or less cited than theoretical research. Thus, each paper is classified as empirical if it includes tables or figures that depicted data. Empirical papers are further classified as experimental if the data were generated by controlled experimentation in a laboratory. The presence of a mathematical appendix is also recorded for theoretical papers. A mathematical appendix may be indicative of more technical detail, or less interpretation in terms of economic intuition.

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<sup>2</sup> Packard (1994) contains a list, definitions, and examples of commonly used poetic devices. The list was used for the classification. Titles were only classified as containing a poetic device if they contain a fresh or lively application of the device. For example, old or dead metaphors, such as “demand curve” or “game theory,” did not qualify as fresh or lively applications of the metaphor device.

<sup>3</sup> The authors used citations data for the period 1995-1999 to construct the ranking. The data used in this paper is for the period 1992-1996. Department rankings may have changed between these two periods, but not substantially.

A paper's length may affect its productivity, so data was obtained on the number of pages in each paper. To account for differences in page length across journals, these are adjusted and the number of AER-equivalent pages is used.

Other recorded paper characteristics include whether the author employed research assistance, whether the author received a grant for the underlying research, and how many colleagues or peers offered the author comments on the paper. By presenting papers at seminars or discussing them informally with peers, authors often receive valuable suggestions for improvement. The number of peer acknowledgements made by the author is a proxy (albeit a rough one) for the positive externalities that the author enjoyed by being in, or traveling to, a productive research environment.

Authors who have received a grant to support the research underlying their paper have already successfully passed through a selection process. Moreover, grants may allow researchers to undertake larger or more expensive projects, which may be more productive than smaller or less expensive ones.

Grants are sometimes used to support research assistants. For empirical work on small samples, minor mistakes made by an inexperienced assistant may affect the results. In these cases, research assistance may be counter-productive. In other cases, relationships between researcher and assistant may be very productive, especially if the latter is a graduate student under the former's supervision.

Table 1 describes the sample of 268 papers for which the aforementioned article characteristics were gathered. Approximately thirty percent of papers in the sample have a figure of speech in the title. The average paper in the sample was cited nineteen times over the six-year period following its publication. The mean six-year productivity, number of peer acknowledgements, and length, of empirical papers are greater than those of theoretical papers.

Table 1: Means (SD) of Variables Describing Aspects of Papers, by Method

Variable	All	Theory	Empiric
Cites to paper, year $t + 1$ to $t + 6$	19.354 (19.314)	17.691 (18.721)	20.816 (19.760)
Poetic title	0.283 (0.451)	0.316 (0.467)	0.258 (0.439)
Grant	0.604 (0.489)	0.551 (0.499)	0.653 (0.477)
AER-equivalent pages	17.536 (5.166)	16.719 (4.968)	18.233 (5.246)
Cites of author, year $t$	22.626 (36.562)	25.016 (41.694)	20.204 (31.371)
Econ. department	0.813 (0.391)	0.809 (0.393)	0.816 (0.388)
Econ department rank	47.821 (61.026)	42.551 (56.047)	52.125 (64.723)
Research assistance	0.268 (0.444)	0.133 (0.341)	0.380 (0.487)
Peer acknowledgements	6.858 (4.778)	6.491 (4.535)	7.156 (4.978)
Math appendix		0.625 (0.486)	
Experimental			0.034 (0.181)
N	268	121	147

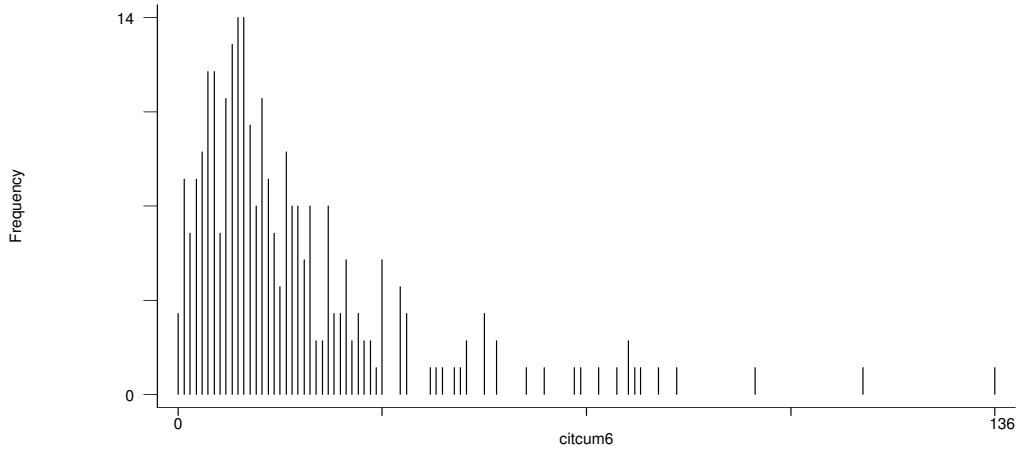


Figure 1: Cumulative Citations Over the First Six Years after Publication, Frequency Distribution

The t-statistics testing the hypothesis of equality across method are  $t = 1.326$ ,  $t = 1.143$ , and  $t = 2.421$ , respectively. At commonly employed levels of statistical significance, the null hypothesis is only rejected for mean length.

Approximately eighty percent of papers were written by authors affiliated with economics departments. The mean ranking of the departments of the published empirical authors is lower than that of the published theoretical authors. This suggests that mainly authors from top universities publish theoretical research in top journals, while authors from a broader range of universities publish empirical research in top journals. The average career citations count of theoretical authors is also greater than that of empirical authors, suggesting that mainly authors with proven track records and big names publish theoretical research in top journals, while less experienced and lesser known authors can nevertheless publish empirical research in top journals. However, the t-statistics testing the hypothesis that the mean ranking of author affiliation and author career citations count are the same across method are  $t = 1.297$ , and  $t = 1.049$ , respectively.

To test whether titles, as well as the names of authors, authors’ institutions, and journals of publication, have an effect on the productivity of articles, controlling for other article characteristics, the following regression was performed:

$$\sum_{j=1}^6 P_{t+j,i} = \alpha + \beta PoeticTitle_i + X_i\delta + \varepsilon_i \quad (1)$$

where  $\sum_{j=1}^6 P_{t+j,i}$  is the cumulative number of citations that article  $i$  received six years after it was published, and  $X$  contains other article characteristics (including eighteen JEL classification dummies), as well as author and journal characteristics. Figure 1 plots cumulative citations over the six-year period after publication. Because of its skewness, its concentration at zero, and its integer values, equation (1) is estimated using Poisson regression. The results are reported in Table 2. The first two columns present the coefficient estimates and marginal effects for the entire sample. For dummy variables, such as *Poetic title*, the “marginal” effects are for discrete changes from 0 to 1.

In the full sample, poetry in the title has a positive and statistically significant impact on an article’s citations. However, the effect is small. A poetic title earns the average paper a modest one and a half extra citations over its lifetime. But the effect is much larger if only empirical papers are considered. The third and fourth columns present the coefficient estimates and marginal effects for the sub-sample of empirical papers, while the last two columns present them for the sub-sample of theoretical papers. A poetic title earns an empirical paper almost four and half extra citations over its lifetime, but reduces a theoretical paper’s lifetime citations by almost three.

Thus, a rhetorical flourish in the title is counter-productive for theoretical papers, but very productive for empirical papers. Indeed, an extra four and a half citations represents about twenty percent of the lifetime citations of the average empirical article. Perhaps poetic titles are more productive in empirical work because such work appeals to a more

Table 2: Coefficient Estimates (SD) of the Determinants of Article Productivity

Variable	All ( $N = 268$ )		Empiric ( $N = 147$ )		Theory ( $N = 121$ )	
	$\sum_{j=1}^6 Q_{t+j}$	Mfx	$\sum_{j=1}^6 Q_{t+j}$	Mfx	$\sum_{j=1}^6 Q_{t+j}$	Mfx
Poetic title	0.077 (0.033)	1.425	0.219 (0.047)	4.423	-0.200 (0.055)	-2.747
Grant	0.146 (0.033)	2.599	0.038 (0.048)	0.719	0.324 (0.058)	4.622
AER-pages	0.029 (0.003)	0.530	0.005 (0.004)	0.103	0.090 (0.006)	1.302
AER	-0.120 (0.038)	-2.141	-0.286 (0.052)	-5.229	-0.116 (0.069)	-0.668
JPE	-0.175 (0.039)	-3.071	-0.0213 (0.050)	-3.929	-0.197 (0.074)	-2.747
Author cites, year $t$						
10-49	0.334 (0.033)	6.427	0.404 (0.048)	8.457	0.341 (0.057)	5.189
50-99	0.020 (0.061)	0.375	0.397 (0.080)	9.073	-0.441 (0.115)	-5.344
$\geq 100$	0.180 (0.061)	3.531	0.653 (0.084)	16.915	-0.280 (0.111)	-3.609
Econ dept	0.030 (0.041)	0.537	-0.117 (0.061)	-2.335	0.339 (0.079)	4.428
Econ dept * Rank						
0-10	0.206 (0.045)	3.899	0.284 (0.054)	5.822	0.161 (0.068)	2.397
11-20	-0.052 (0.041)	-0.925	-0.007 (0.065)	-0.133	-0.363 (0.081)	-4.620
21-30	-0.119 (0.067)	-2.056	0.028 (0.082)	0.559	-0.647 (0.136)	- 7.099
Research assistance	-0.071 (0.033)	-1.257	0.015 (0.041)	0.286	-0.623 (0.092)	- 7.270
Acknowledgements	0.018 (0.002)	0.332	0.002 (0.004)	0.039	0.056 (0.005)	0.814
Empirical	0.190 (0.032)	3.406				
Math appendix					-0.516 (0.061)	-8.005
Experimental			-0.197 (0.124)	-3.435		
LR chi2(10)	722.29		509.60		817.99	
Pseudo R2	0.142		0.183		0.357	

general audience, and general readers are more susceptible to rhetoric. Another theory is that empirical work has more caveats and interpretational subtleties than theoretical work. Therefore, summaries that stick the major point in the brain of the reader may be correspondingly more valuable for empirical work.

In the full sample, articles by authors from top ten economics departments received almost four more citations over their lifetime than articles by authors from economics department that are not in the top thirty. Articles by authors with between ten and fifty career citations received almost six and a half more citations than articles by authors with fewer than ten career citations. These effects are larger for empirical papers, and smaller for theoretical papers. This suggests that having a reputation may be more productive in empirical research than in theoretical research. Indeed, empirical articles by “superstar” authors with more than one hundred career citations earn a whopping sixteen more citations than empirical articles by “no name” authors with fewer than ten career citations; while theoretical articles by superstar authors received more than three and half fewer citations than theoretical authors with fewer than ten career citations.

Grants, length, and peer acknowledgements each have a positive impact on an article’s productivity, while research assistance has a negative impact on an article’s productivity. Surprisingly, grants are especially productive for theoretical papers. Not surprisingly, research assistance is especially counter-productive for theoretical papers. A striking result is the last entry in the last column of Table 2. A math appendix reduces a theoretical article’s lifetime productivity by more than eight full citations. A math appendix correlates with a higher level of technical detail, which considerably reduces a paper’s citations.<sup>4</sup>

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<sup>4</sup> But relegating math to appendix may also be negative. Perhaps incorporating the math into the body of the text requires that it be interpreted in terms of economic intuition, and this may be productive. To distinguish between these two possible explanations for the negative impact of a math appendix, the theoretical papers were classified according to whether they are math intensive, based on a simple visual scan of them (both the use of math and the level of the math used were taken into account). The mean

## 2. Conclusion

This paper examined the impact of various characteristics of published economics articles on the ultimate success of these articles, as measured by their citations after publication. The results could serve as a guide to editors (and possibly authors) who want to publish articles that will be highly cited. If editors are faced with two empirical papers, the quality of which they cannot seem to distinguish, and only one of which they can publish, then the results suggest that they should choose the one by the more famous and experienced author, who is at the higher ranked economics department. If editors must choose only one of two theoretical articles of seemingly similar quality, then they should choose the one by the younger, less experienced author, who is at the higher ranked economics department, and who has already received a grant for the underlying research, and did not include a mathematical appendix. Editors should also suggest that theoretical authors make their titles more informative and empirical authors make their titles more poetic or catchy.

The main result was the substantial impact of poetic titles on the productivity of published economics articles. The impact was found to be negative for theoretical papers, substantially positive for empirical papers, and positive on the whole. The findings suggests that rhetoric and poetry are still important parts of economics, and that today's economists must be aware of this to be successful.

Deirdre McCloskey [1994, 1998] has written extensively on the importance of recognizing the role of rhetoric and poetry in economics, arguing that poetic devices are the form and substance of science, rather than its antithesis. McCloskey [1998] has also demonstrated

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six-year citations was found to be greater for the articles with a math appendix than for those without one, both in the groups of articles that are not math intensive and in the math intensive group. But the t-tests did not reject the null hypothesis of equality in either group. Thus a math appendix does not really affect an article's productivity in and of itself. Rather it is math that reduces an article's productivity, and a much greater proportion of math intensive articles have a math appendix than do articles that are not math intensive.

how to perform a rhetorical analysis of an economic text, illustrating the task by carefully distinguishing the various rhetorical devices that were employed in two famous articles, one by Robert Solow [1957] on the aggregate production function [p. 48-51], and the other by John Muth [1961] on rational expectations [Chapter 4].

Poetic devices are employed throughout the actual text of articles, not only in their titles. It would be interesting to distinguish the different rhetorical devices employed in the text of every article in a large sample, following the methods developed and illustrated by McCloskey. One could then count the number of poetic devices of each kind employed in each article, and estimate their cumulative and differential impact on the article's productivity, thereby gaining an even deeper understanding of the role of rhetoric and poetry in economics.

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