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Internet Access, Journal Ranking, and Citation Performance

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This study examines the citation records of economics and finance journals during the period 2001-2003. We investigate whether citation frequency is linked to the quality of internet access provided by the journals. First, we construct turnover factors that not only measure the number of citations but also take into account the speed of citation. Second, we use a logit model to study the relationship between internet access and journal rankings. Finally, we develop a regression model that tests whether citation performance is affected by past ranking, self-citation, journal size and access to publications. Our findings suggest that free access to current articles is used by lower ranked journals in response to low citation frequency. Additionally, the OLS estimation results show that free online access to articles played a significant role in improving the citation performance of these journals. More specifically, internet access mitigated the impact of journal size and increased the impact of self-citations.

INTRODUCTION

The citation record of economics and finance journals has received considerable attention from scholars. The main reason for analyzing citation records is to measure a journal's influence in its field and its role in the communication of knowledge. Further, citations can be used to quantify the output of scholars and rank the intellectual contributions of universities. One area that has received very little attention in the literature is the impact of recent technological advances on the improvement of citation frequency.

The decade of the 1990's provided a huge leap in the availability of information via the internet. For scholars in the field of finance and economics, this resulted in an easier and timelier mechanism for finding or updating their reference sources. A question arises as to how the availability of scholarly publications on the internet has influenced the number of citations and therefore the ranking of individual journals. Specifically, this paper constructs new "turnover factors" to measure citation frequency and investigates whether "free of charge" electronic access to abstracts and full-text articles has modified this factor. As the peak of citations is usually reached between three and four years after

publication (Chung, Cox and Mitchell 2001), a second question concerns the factors (including internet access) that may influence citation patterns in the early years after publication. An OLS model is developed to test whether past ranking, self-citation, journal size and the level of access to publications has an impact on citation levels.

The remainder of this paper is divided into five sections. Section II provides a summary of previous research related to measures of citation performance. Section III concentrates on variable construction and sample statistics. Section IV describes the logit and OLS models used to analyze the relationship between internet access and journal rankings. T-tests and an OLS model are developed in section V in order to further explain the citation record of the journals after three years. Concluding remarks are provided in section VI.

EXISTING MEASURES OF CITATION PERFORMANCE

Previous studies have used several citation-based methodologies to evaluate journal influence on citation performance. Alexander and Mabry (1994) rank the fifty most frequently cited journals, identify the fifty most cited authors, and note topical research trends from January 1987 through March 1991 by evaluating the total number of citations in the four following finance journals: *Journal of Finance* (*JF*), *Journal of Financial Economics* (*JFE*), *Journal of Financial and Quantitative Analysis* (*JFQA*), and *Review of Financial Studies* (*RFS*). The authors report that citations reach a peak two years after publication and that the average half-life of an article is 4.5 years. Chang, Cox and Mitchell (2001) extend Alexander and Mabry's study by attempting to identify the most influential finance scholars and journals over a longer 25-year period. Using all of the citations found in the *JF*, *JFE*, and *JFQA* from 1974 through 1998, the authors found that a small number of top researchers dominate the number of citations in the leading finance journals and that self-citation affects the citation-based journal rankings.

Arnold, Butler, Crack and Altintig (2003) follow the methodology of Alexander and Mabry and rank journal articles by the number of times they are cited in six top finance journals over a ten year period (1990 – 1999). The authors then rank individual journals by the number of what they call "important papers" (i.e. those papers cited most frequently). They note that the rankings of journals change depending on whether one uses the number of important papers or the total number of citations based on the *Social Sciences Citation Index* (*SSCI*) published by the *Institute for Scientific Information* (*ISI*). Arnold et al. argue that the number of important papers provides a more accurate view of quality because it mitigates the effects of highly cited outliers, negative citations, and self-citations. Cox, Chung, and Mitchell (2003) analyze all citations in articles and notes published in *JF*, *JFE* and *JFQA* from 1974 to 1998. Noting that a few prolific authors account for more than a third of citations in the leading finance journals during the sample period, the authors develop a stochastic model of citation to explain these observed regularities.

The most common citation-based methodology used in studies of journal rankings

is an impact factor calculated from citation data found in the *SSCI*. Developed by the *ISI*, the *SSCI* impact factor is calculated for year (t) as the number of times articles published in year (t) cite a specific journal's articles published in years ($t-1$) and ($t-2$) divided by the total number of articles published in the journal in years ($t-1$) and ($t-2$). Only established journals can be found in the *SSCI*, making inclusion in the index a record of influence by itself (Borokhovich, Bricker, and Simkins 1999). Borokhovich, Bricker, Brunarski, and Simkins (1995) use the *SSCI* impact factor to analyze differences in finance research productivity and influence across academic institutions.

In addition to the *SSCI* impact factor, Borokhovich, et al. (1999) use the *ISI*'s immediacy index and an index developed by Durenberg (1993) to examine both the short-term and long-term relative performance of *Financial Management (FM)*. The immediacy index is calculated by taking the total number of article citations for a specific journal in year t and dividing by the total number of articles published in the journal during year t . In other words, the index indicates how quickly the articles published in one specific journal are cited in other articles. Durenberg's index is based on the cited half-life of a journal emphasizing the long-term impact of a journal. It is calculated as the product of the *SSCI* impact factor and cited half-life.

Chan, Fok, and Pan (2000) use the *SSCI* impact factor to examine the relative influence of 59 finance journals. In addition to journals that appear in the *SSCI's Journal Citation Reports (JCR)*, the authors include other influential journals such as the *Financial Review (FR)* as well as more recently published journals that are included in Heck's *Finance Literature Index (FLI)*. The authors find their top ten ranked finance journals to be similar to those presented in previous studies and that several new journals [i.e., *Journal of Financial Intermediation (JFI)*, *Journal of Empirical Finance (JEMF)*, and *Mathematical Finance (MF)*] gained higher ratings.

Potential biases in the indexes chosen to measure journal performance have been addressed by several authors. Borokhovich et al. (2000) report that impact factors have a high variability over time. Also, this ratio concentrates on a journal's short-term influence resulting in the exclusion of important innovative research that takes longer to be recognized as such. Another bias is due to the fact that most journals tend to cite themselves more frequently than they are cited by others. Chung et al. (2001) report that during the period 1974-1988, the percentage of self-citation was 56% for the *Journal of Finance*, 38% for the *Journal of Financial Economics* and 45% for the *Journal of Financial and Quantitative Analysis*. However, these self-citations also reflect the fact that these journals belong to a core that has the greatest influence on the discipline (see Borokhovich et al., 1994).

One article addresses the impact of the internet on journal influence. Pinkowitz (2002) uses the *Journal of Finance (JF)* Web site to analyze download patterns for papers that were available from November 1997 to November 1999. The Web site posts full-text versions of forthcoming papers as free of charge downloads. The author also gathers citation and journal impact factor data from the *SSCI* database for the time period under investigation. Pinkowitz notes three weaknesses in using citation analysis alone to

evaluate research impact. First, counting citations ignores the impact of academic research on practitioners who use the results but do not participate in the research. The second potential problem is publication lag. Last, citations measure the ability of authors to actually get published but not their scholarship activities. The author argues that Web downloads rather than citation analysis may be a superior quantitative method to evaluate research impact because they are significantly related to future citations. His regression results suggest that allowing free web access to forthcoming articles does not cause a decrease in subscriptions, promotes citations, and increases a journal's impact factor.

This paper addresses the impact of internet access on journal citations differing from previous research in several ways. First, we develop a new impact factor that takes into account the speed of citations. Second, the study uses a larger sample of journals with different internet access levels to evaluate journal rankings.

SAMPLE CHARACTERISTICS AND METHODOLOGY

Sample and Variable Construction

This study begins by using 41 economics and finance journals that can be found in the *SSCI's Journal Citation Reports (JCR)*. In addition to the number of articles and citations found in the *SSCI*, data were manually collected on the availability of these publications on the internet as of July 2002. First, five data bases were searched to determine internet access for the sample of journals. The five data bases searched were *Ingenta*, *Science Direct*, *Jstor*, *Ideal*, and *Kluwer*. Second, data were collected on the online availability of table of contents, abstracts, and full-text articles without a subscription (free of charge). The citation record of these journals was then measured from January 2001 to December 2003 (before and after the July 2002 data collection time for internet access).

We create three turnover factors to measure citation frequency as follows:

Ratio 01/02 =
$$\frac{\text{Citations in Jan. 2001 through June 2002 to articles pub. in 2001}}{\text{Total number of articles pub. in 2001}} \tag{1}$$

Ratio 02/03 =
$$\frac{\text{Citations in July 2002 through Dec. 2003 to articles pub. in 2001}}{\text{Total number of articles pub. in 2001}} \tag{2}$$

Ratio 01/03 =
$$\frac{\text{Citations in Jan. 2001 through Dec. 2003 to articles pub. in 2001}}{\text{Total number of articles pub. in 2001}} \tag{3}$$

The specificity of these turnover factors is that they measure how fast articles are used as citations. In other words, by breaking the three year sample period into 2 sub-periods (Ratio 01/02 and Ratio 02/03), we can measure citation activity immediately

following internet access or within 18 months verses that which occurs after 18 months. By contrast, Chan et al. (2000) measure citations in 1998 based on 96-97 publications (1 to 2 year gap). Pinkowitz (2002) uses a two year period for downloads and does not consider the speed at which downloaded information is disseminated.

Three response level variables for each journal are created based on the level of information available free of charge:

- no = no table of contents or nothing online = 1
- abstract = abstracts available for free = 2
- text = full-text articles available for free = 3

In our sample of 41 journals, 6 journals do not provide any text on their current articles (only titles), 32 provide abstracts and 3 provide full-text articles for free. This classification is used to create an ordinal variable with three levels.

Sample Statistics

Table 1 provides citation statistics for the period 1998-2003. Table 2 provides the means and quantiles for the sample of 41 journals. Based on the citation ratio for the first period (01/01 to 06/02), the journal rankings are: 1) *Journal of Accounting and Economics* (JAE), 2) *Quarterly Journal of Economics* (QJE), 3) *Review of Financial Studies* (RFS), 4) *Journal of Finance* (JF) and 5) *Journal of Financial Economics* (JFE). When considering the entire sample period, the same five journals have the top rankings in slightly different order (based on Ratio 01/03). A small variation occurs in the five top ranked journals for the second sub-period (based on Ratio 02/03) where the *American Economic Review* (AER) replaces the *Review of Financial Studies* (RFS) in the rankings. The ranking of the bottom journals is also stable which seems to indicate low variability in citation frequency during this three year period. However, a larger time period may generate different results (as found in other studies). Also, other studies rely on a larger gap between publication and citation which may explain our different rankings. Our ranking takes into account the speed of citation which may be explained by internet access. This may also explain the change in rankings between periods. Overall, Table 2 underlines the large discrepancies in journal size (from 12 articles to 233 articles published), self-citation rates (6% to 93%) and citation levels (from 6 to 829 citations for a three-year period).

JOURNAL'S MOTIVATION TO PROVIDE FREE ONLINE ACCESS TO ITS PUBLICATIONS

Model Choice

In this section, we investigate whether the choice of internet access by a journal is

Table 1. Article and Citation Statistics for Journals 1996-2003

Citation statistics are shown for 41 economics and finance journals. Impact Factor 1998 represents the average number of citations in 1998 by the articles that appeared during 1996 and 1997 and is used as a proxy for journal quality. The Self Citation Ratio is the ratio of self-citations in 1998 by total citations in 1998. Total articles published for each journal in 2001 (Pub. 2001) are shown with total citations for two 18 month (Cit. 01/01 to 06/02 and Cit. 07/02 to 12/03) and one three year time period (Cit. 01/01 to 12/03). The citation ratios (Ratios 01/02, 02/03, 01/03) are calculated by dividing the number of citations during each period to articles published in 2001 by the total number of articles published in 2001.

Name of Journal	Self		Pub.	Cit.		Cit.	Cit.		Cit.
	Impact Factor 1998*	Citation Ratio 1998*		01/01 06/02	Ratio 01/02		07/02 12/03	Ratio 02/03	
			2001						01/03
Accounting Review	0.91	0.30	29	16	0.55	50	1.72	66	2.28
American Economic Review	0.97	0.11	180	118	0.66	711	3.95	829	4.61
Econometrica	0.82	0.21	66	58	0.88	260	3.94	318	4.82
Economic Journal	0.11	0.14	72	29	0.40	133	1.85	162	2.25
Economic Letters	0.08	0.62	233	16	0.07	115	0.49	131	0.56
Financial Analysts Journal	0.49	0.37	36	9	0.25	32	0.89	41	1.14
Financial Management	1.02	0.70	18	7	0.39	38	2.11	45	2.50
Journal of Accounting Research	0.50	0.36	35	16	0.46	80	2.29	91	2.60
International Economic Review	0.33	0.09	45	8	0.18	103	2.29	88	1.96
Journal of Accounting and Econ.	0.71	0.25	19	45	2.37	75	3.95	148	7.79
Journal of Am. Statistical Assoc.	0.24	0.87	115	67	0.58	389	3.38	456	3.97
Journal of Banking and Finance	0.55	0.20	96	22	0.23	81	0.84	103	1.07
Journal of Business	0.82	0.06	22	17	0.77	44	2.00	61	2.77
Journal of Bus. Econ. & Statistics	0.52	0.16	46	16	0.35	66	1.43	82	1.78
Journal of Econometrics	0.54	0.22	92	37	0.40	174	1.89	211	2.29
Journal of Economic Perspectives	0.73	0.31	54	41	0.76	209	3.87	250	4.63
Journal of Economic Theory	0.29	0.50	90	33	0.37	142	1.58	175	1.94
Journal of Econ. & Business	0.07	0.40	34	1	0.03	5	0.15	6	0.18
Journal of Finance	2.26	0.22	85	118	1.39	400	4.71	518	6.09
Journal of Fin. & Quant. Analysis	1.24	0.09	25	11	0.44	42	1.68	53	2.12
Journal of Financial Economics	2.26	0.20	60	64	1.07	253	4.22	317	5.28
Journal of Fin. Intermediation	0.92	0.13	12	3	0.25	6	0.50	9	0.75
Journal of Financial Research	0.25	0.12	27	4	0.15	17	0.63	21	0.78
Journal of Fin. Services Research	0.34	0.07	27	20	0.74	17	0.63	37	1.37
Journal of Futures Markets	0.28	0.31	52	7	0.13	32	0.62	39	0.75
Journal of Intern. Bus. Studies	0.38	0.93	47	17	0.36	120	2.55	137	2.91
Journal of International Econ.	0.56	0.17	65	44	0.68	157	2.41	201	3.09
Journal of Internat. Money & Fin.	0.52	0.06	48	19	0.40	57	1.19	76	1.58
Journal of Law and Economics	0.44	0.11	31	8	0.26	35	1.13	43	1.39
Journal of Monetary Economics	0.54	0.10	51	11	0.22	118	2.31	129	2.53
Journal of Money, Credit & Bank.	0.71	0.11	44	7	0.16	45	1.02	52	1.18
Journal of Political Economy	1.05	0.12	44	31	0.70	144	3.27	175	3.98
Journal of Portfolio Management	0.31	0.28	44	4	0.09	21	0.48	25	0.57
Journal of Real Estate Fin. & Econ	0.53	0.41	40	5	0.13	24	0.60	29	0.73
Journal of Risk and Insurance	0.25	0.80	64	1	0.02	23	0.36	24	0.38
Journal of Risk and Uncertainty	0.21	0.64	27	7	0.26	45	1.67	52	1.93
Mathematical Finance	0.58	0.32	20	6	0.30	26	1.30	32	1.60
Quarterly Journal of Economics	1.21	0.15	42	76	1.81	324	7.71	400	9.52
Real Estate Economics	0.43	0.40	26	3	0.12	28	1.08	31	1.19
Review of Econ. & Statistics	0.40	0.19	68	38	0.56	121	1.78	159	2.34
Review of Financial Studies	1.36	0.12	39	60	1.54	151	3.87	211	5.41

*Data obtained from Chan, Fok and Pan (2000)

Table 2. Median Values for Article and Citation Data

Comparative descriptive statistics are shown for 41 economics and finance journals based on journal quality (Impact Factor 1998 and citation Ratios 01/02, 02/03, 01/03), self-citation rates (Self Citation Ratio 1998), journal size (Publications 2001) and citation levels over three periods. Impact Factor 1998 represents the average number of citations in 1998 by the articles that were published in 1996 and 1997. The citation ratios are calculated by dividing the number of citations during each period to articles published in 2001 by the total number of articles published in 2001. Self Citation Ratio 1998 is the ratio of self citations to total citations.

Variable	Min.	25th	Median	75th	Max.	Mean
Impact Factor 1998*	0.07	0.33	0.53	0.82	2.26	0.65
Self Citation Ratio 1998*	0.06	0.12	0.21	0.37	0.93	0.29
Publications 2001	12	29	44	65	233	55
Citations Jan 01 to Jun 02	1	7	16	38	118	27
Ratio 01/02	0.02	.22	0.39	0.68	2.37	0.52
Citations Jul 02 to Dec 2003	5	32	75	144	711	119
Ratio 02/03	0.15	0.89	1.72	2.55	7.71	2.08
Citations Jan 2001 to Dec 2003	6	41	88	175	829	147
Ratio 01/03	0.18	1.18	2.12	3.09	9.52	2.60

*Data obtained from Chan, Fok and Pan (2000)

linked to its past citation performance. More precisely, we test whether the level of free internet access constructed in the previous section is explained by a journal's past ranking and the evolution of this ranking between 1998 and 2001. Since the dependent variable is ordinal a logistic regression model is chosen. The model takes the following form:

$$g[\text{Prob}(y \leq i/x)] = \alpha_i + \beta' x$$

where:

$$\begin{aligned} \alpha_i &= \text{intercepts} & 1 \leq i \leq k \text{ or } i = 1, 2, 3 \\ x &= \text{explanatory variables} \end{aligned}$$

In our study, the logistic model takes the following form:

$$\text{Logit}_p = \text{Intercept 1} + \text{Intercept 2} + b_1 \cdot \text{Rank98} + b_2 \cdot \text{RChange} \tag{4}$$

where:

$$\begin{aligned} \text{Rank98} &= \text{journal ranking based on the 1998 impact factor} \\ \text{RChange} &= \text{the \% change in rank from 1998 to 2001} \end{aligned}$$

Maximum likelihood estimates (MLE) are generated for the two intercepts and two explanatory variables. The probabilities modeled are cumulated over the lower ordered values. This means that a positive value for the parameter estimates b_1 and b_2 indicates a tendency towards the lower category “level 1” or “rank 1” which is the lowest quality level (no abstract or full text).

Empirical Results

Table 3 presents the maximum likelihood parameter estimates and tests of model fit for the logit model described in Equation 4. The two explanatory variables, Rank98 and RChange, are both statistically significant. Their positive coefficients indicate that journals with good rankings and/or improvement in their rankings are less likely to provide a good level of internet access. Used for lower ranked journals, these results show that free access to current articles is used to improve visibility and citation frequency.

Having analyzed the quality of internet access provided by economics and finance journals, we now investigate factors affecting subsequent journal citations. The next section investigates whether internet access combined with past performance, journal size and self-citation played a role in the speed and improvement of citation records.

CITATION IMPROVEMENT AND INTERNET ACCESS

Descriptive Statistics and t-tests

In this section, journals are categorized based on three criteria: their impact factor in 1998 (Impact98), the self-citation ratio (Self98) and the number of publications for 2001 (Pub2001). The criteria are used to analyze the rate and speed at which publications are turned into citations. Journals in the 25th percentile for their impact factor are categorized as “low ratio”. Journals in the 75th percentile for self-citation and those in the 75th percentile for the number of published articles are put in the “high” category. Table 4 reports the means and medians of four variables in each category: citations 01/01 to 06/02, citations 07/02 to 12/03, citations 01/01 to 12/03, and the percentage change (% Change) between July 2002 and December 2003. T-tests are also presented based on the “low” and “high” category split.

The results indicate that journals with higher past performance (Impact98) and/or lower self-citation rates generated more citations during the first sub-period (Jan 2001 to June 2002). However, after three years, all categories had cumulative citation levels that were not statistically different. Based on our results in section IV, we suggest that this is due to the higher citation frequency of lower ranked journals after June 2002. Journals with high self-citation rates also showed a significant increase in their citation levels during the second time period (July 2002 to December 2003). Wilcoxon tests were also run on the sample and gave similar results. In the next section, we investigate

Table 3. Impact of Journal Ranking on the Level of Internet Access

Panel A provides the logit model maximum likelihood parameter estimates used for the tests of model fit provided in Panel B. The logit model tests whether the level of free internet access (table of contents only, abstracts only or full text) provided by 41 economics and finance journals can be explained by an individual journal’s past ranking and/or an improvement in ranking. Rank98 ranks journals based on Chan, Fok and Pan’s (2000) 1998 Impact Factor which measures how often a journal article is cited in 1998 based on initial publication in 1996 or 1997. RChange is the percentage change in rank for a particular journal from 1998 to 2001.

Panel A: Parameter Estimates for Logit Model

Parameter	Estimate	Chi-Square	Pr > ChiSq
Intercept 1	-4.0066	9.3944	0.0022
Intercept 2	0.9747	1.0658	0.3019
Rank98	0.0760	3.4462	0.0634
RChange	0.9496	4.5552	0.0328

Panel B: Tests of Global Model Fit (DF=2)

Test	Chi-Square	Pr > ChiSq
Likelihood Ratio	5.8223	0.0544
Score	5.4584	0.0653
Wald	5.0600	0.0797

whether lower ranked journals improved their rankings with internet access.

Model and Regression Analysis

In section IV, we provided evidence showing that lower ranked journals were more likely to provide free internet access to their articles and abstracts. In this section, we test the hypothesis that current citation performance is affected by past ranking, self-citation, journal size and more importantly, free internet access to publications. An OLS model is constructed to test whether these four variables have an impact on citation levels. Equation 5 presents the regression model as follows:

$$\begin{aligned} Citations\ 01/03 = & a + b1*Impact98 + b2*Pub2001 + b3*Self98 + \\ & b4*Self98*dum + b5*Pub2001*dum + e \end{aligned} \tag{5}$$

Table 4. Sample T-Tests by Journal Category

Means and medians are provided for four journal variables categorized by three criteria. The criteria used on 41 economics and finance journals analyze the rate and speed at which publications are turned into citations. Journals in the 25th percentile for their 1998 Impact Factor (Impact98), self-citations (Self98) and number of published articles (Pub2001) are placed in the “Low” category. Journals in the 75th percentile for each criterion are placed in the “High” category. The number of citations for each of three time periods (01/01 to 06/02, 07/02 to 12/03, and 01/01 to 12/03) and the percentage change between July 2002 and December 2003 are used for comparison.

Variable	Low Impact98 (11 obs.)	High Impact98 (30 obs.)	Low Self98 (29 obs.)	High Self98 (12 obs.)	Low Pub2001 (30 obs.)	High Pub2001 (11 obs.)
Citations 01/02						
Mean	16.09**	31.43**	32.34**	15.17**	18.00*	52.72*
Median	7.00	18.00	20.00	8.00	10.00	38.00
Citations 02/03						
Mean	41.09	64.07	66.07	38.17	36.83*	115.36*
Mean	22.00	33.50	34.00	20.00	24.50	94.00
Citations 01/03						
Mean	107.18	161.80	166.03	101.50	92.33*	292.64*
Median	52.00	97.00	103.00	48.50	52.50	201.00*
% change 02/03						
Mean	731%*	440%*	434%*	722%*	538%	463%
Median	525%	419%	425%	562%	447%	448%

* indicates significance at the 5% level for the t-test comparing categories 1 and 2.

** indicates significance at the 10% level for the t-test comparing categories 1 and 2.

where:

Citations 01/03 = citations from Jan 2001 to December 2003 of articles published in 2001

Impact98 = impact factor 1998

Pub2001 = articles published in 2001

Self98 = self-citations in 1998 / citations in 1998 (See Chan et al.)

Dum = dummy variable equal to 1 if journal provides free internet access to abstracts and/or full text

Table 5. OLS Results for Equation 5

Regression results are provided for 41 economics and finance journals. The dependent variable represents current citation performance and is calculated as the number of citations from January 2001 to December 2003 of articles published in 2001. Impact98 is the 1998 Impact Factor of Chan, Fok and Pan (2000) which measures how often a journal article is cited in 1998 based on publication in 1996 or 1997. Pub2001 is the total number of articles published in 2001 and Self98 is the ratio of self-citations in 1998 to total citations in 1998. The dummy variables are used to capture any relationship between self-citations, articles published in 2001, and the level of internet access. Each dummy variable equals 1 if a journal provides free internet access to abstracts and/or full text articles.

Variable	Parameter estimate	Standard error	T value
Intercept	-91.41*	35.29	-2.59
Impact98	180.31*	28.98	6.22
Pub2001	4.19*	0.46	9.03
Self98	-200.98	113.10	-1.78
Self98*dummy	330.58*	123.61	2.67
Pub2001*dummy	-2.93*	0.55	-5.30

* indicates significance at the 5% level

Table 5 reports the regression results for Equation 5. The adjusted R-Square for the model is 0.74 which provides a good model fit for these five explanatory variables. The coefficients on Impact98 and Pub2001 are both statistically significant suggesting that, as expected, past performance and journal size are good predictors of citation levels. The coefficient on the self-citation variable alone is not statistically significant at the 5% level, but the impact of the dummy is noticeable. Free internet access combined with a high self-citation rate leads to a statistically positive impact on the 2001-2003 citation level. The impact of the dummy on the Pub2001 variable is also statistically significant, but it mitigates the impact of journal size on citation output. This is positive news for smaller journals that seem to benefit from internet access by reducing the impact of journal size.

CONCLUSIONS

This study concentrates on the citation patterns of economics and finance journals over the period 2001-2003. Our goal is to measure the impact of internet access on journal citations. First, three “free of charge” access levels to current articles are used in

a logit model: table of contents only, abstracts only, or full text. Our results indicate that lower ranked journals are more likely to provide free internet access to abstracts and full texts in an effort to increase their visibility and citation record.

Second, we investigate whether past performance, number of publications and self-citation combined with internet access have a positive impact on a journal's citation performance. T-tests show that lower ranked journals have a statistically greater increase in their overall citations and self-citation rates after July 2002, the time of measured internet access. OLS regression analysis confirms that self-citation combined with wider internet access to articles helped lower ranked journals increase their citation levels. Also, internet access mitigated the impact of journal size on citation performance. Overall, web access contributed to the visibility and citation records of lower ranked and smaller journals.

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