The Optimal Order for Submitting Manuscripts

By Sharon Oster*

There have been a number of articles written in the last few years describing the attributes of various economics journals, including their quality, acceptance practices, and so on. Presumably one could use these data both to determine which journals to buy and read, and to which journals to submit one's papers. This paper is concerned with the latter issue; in particular, I derive the optimal strategy for submitting manuscripts to economics journals.

The problem is one which we all face periodically: to which of the many available journals should a paper be sent? For poorly specialized papers, the answer is sometimes obvious. In many cases, however, any one of several journals may be appropriate. This is the case dealt with in this paper.

The first problem in doing this analysis was to decide what the individual might be trying to accomplish by his or her journal choice. In general cases of this sort, one might suppose that individuals made decisions in order to maximize some kind of pecuniary return. This did not seem a fruitful way to model the individual's choice of journal. If we were really interested solely in maximizing pecuniary returns, we probably wouldn't write papers at all. In this paper, two alternative objective functions were used to represent more or less extreme, but plausible, cases: journal choice based on maximizing the stream of "prestige" points from an article versus journal choice based on maximizing the discounted stream of readers of the article. Clearly, both prestige and readership affect one's income; nevertheless these objective functions seemed to be somewhat more general than the strict rate-of-return case.

The choice process has the following characteristics. For each journal \( i \), there is some probability, \( P_i \), that the paper will be accepted. If it is accepted, the article earns its author a discounted stream of benefits over his or her lifetime. If the article is rejected by the first journal, it can then be submitted to a second journal, or a third. If there were no costs to a rejection, one would always adopt the strategy of first submission to the "best" journal. As it is, there is a cost to being rejected (other than the obvious psychic one): the rejection process takes time and while one is waiting the article obsolesces, tenure slots fill up with other people, and so on. In short, one trades off waiting against the quality of journal that finally accepts the article.

The formal optimization problem can be set up as follows. For each ordering of the \( n \) journals, there is a potential stream of benefits. For the ordering \( 1, 2, 3, 4, \ldots, n \), for example, the benefits may be represented as:

\[
B = P_1 \int_{w_1}^{T} g_1 e^{-\rho t} dt \\
+ (1 - P_1) P_2 \int_{w_1 + w_2}^{T} g_2 e^{-\rho t} dt, \ldots, \\
+ P_n \prod_{i=1}^{n-1} (1 - P_i) \sum_{i=1}^{n} \frac{g_i e^{-\rho t}}{w_i} dt
\]

where

\( B = \) expected benefits from submitting to journals in the order \( 1, 2, 3 \ldots n \),

\( P_1 \ldots P_n = \) probability of acceptance in journal \( 1 \ldots n \)

\( g_1 \ldots g_n = \) gain from acceptance in journal \( 1 \ldots n \)

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1Several of the most prominent articles of this genre include, Albert Danielsen and Charles Delorme; Robert Hawkins, Lawrence Ritter, and Ingo Walter (hereafter, H-R-W); Michael Lovell; Richard Quandt; Howard Tuckman and Jack Leahy; and John Weber.
$w_1 \ldots w_n =$ waiting time before decision by journal 1 \ldots n
\hspace{1cm} r =$ discount rate

There are $n!$ of these expected benefit streams. The problem for the individual is to choose among the $n!$ orders for the optimal order.

Several simplifications have been made in (1). I have assumed benefits end at some time $T$ in the future. In the actual computation of (1) I assume $T$ is retirement age, and so ignore the gain from posthumous glory. This assumption turns out to have very little empirical significance since, given the discounting, by the time retirement age comes for a current assistant professor most of the benefits have already been realized. A more significant assumption in this problem is that the $p_i$s are independent of each other: getting rejected from the American Economic Review (AER) does not of itself diminish one’s probability of acceptance in the Journal of Political Economy (JPE). The effect of time lost in the rejection process has been incorporated in the discount rate rather than through the probabilities.\(^2\)

Eight journals were considered in this study and are listed in Table 1. The sample was limited to American journals. Other than that, the selection of journals was somewhat arbitrary, although I think there would be reasonable agreement on the list of journals chosen.

\(^2\)Incorporating interdependence of probabilities in this problem complicates it enormously. Moreover the real connection among the probabilities is difficult to say. Suppose we order the journals 1, 2, 3 \ldots \ldots n in terms of “quality.” Does a rejection from journal 1 lower our expected probability to acceptance in journal 2 more or less than a rejection from journal n? One can argue the case both ways. Suppose referee quality also varies by journal, better journals having more accurate referees. In this case one might see the rejection from journal 1 as “truer” than the rejection from journal n; $P_2$ would be reduced more by a rejection from journal 1 than n. Alternatively one might argue that referee accuracy is constant or randomly distributed across journals, but that standards vary—journal 1 having higher standards than journal n. In this case, $P_2$ would be reduced more by a rejection from n than from journal 1. Given this ambiguity in the nature of the interdependence, and in order to make the problem tractable, I assumed independence.

Table 1 summarizes the data used to calculate (1). The data come from several sources. The two alternative measures of gain come from H-R-W. In this survey, 160 economists were asked to rank a comprehensive list of journals on a point score of 0 to 20. Any journals with which respondents were not familiar were to be omitted. This survey generated two quality indices, which are reported in Table 1: $g$ is the number of “prestige points” found in the H-R-W survey; $f$ is their familiarity index. The familiarity index is my measure of the size of readership of the journal.\(^3\) While the two indices are similar, differences do exist: a comparison of JER and SEJ is striking in this respect. Estimates of the waiting time between the submission of a manuscript and the accept/reject decision as well as the probabilities of acceptance were obtained from a telephone survey of the editorial offices of the eight journals.

Given data on $r$, $T$, $P_i$, $g$, and $w_i$ ($i = 1 \ldots 8$), it is easy to compute $B$ in (1) for any given order. Finding the optimal order (i.e., the order that maximizes $B$), however, is another matter. Some journals are never the optimal first choice. In particular, if we look back to Table 1, the QJE is dominated for all $r$ and $T$ by the AER, Econometrica, and the JPE; the QJE has lower prestige, longer waiting times, and lower acceptance probabilities than any of these three journals. Similarly, the EI is dominated by the SEJ. These dominance patterns were used to eliminate some of the journal permutations in calculating $B$. Other than that, it turned out to be easiest to simply calculate and compare all the remaining orders to find the optimal one.\(^4\)

Given the journal characteristics listed in Table 1, the optimal strategy for submission

\(^3\)An alternative measure of readership would be the circulation of the journal. I think the familiarity index is preferable given multiple readership of library journals.

\(^4\)A simple Fortran program was written to perform these calculations. Computing the optimal order for each of the cases presented in Table 2 required about five minutes on the IBM 370-158 at Yale. I am indebted to Ray Fair for help with these calculations.
### Table 1—Characteristics of Journals

<table>
<thead>
<tr>
<th>Journal</th>
<th>Prestige Index ( g )</th>
<th>Familiarity Index ( f )</th>
<th>Mean Waiting Time: Fraction of a Year ( w )</th>
<th>Acceptance Probability ( P )</th>
</tr>
</thead>
<tbody>
<tr>
<td>American Economic Review (AER)</td>
<td>( g_1 = 18 )</td>
<td>( f_1 = 100 )</td>
<td>( w_1 = .33 )</td>
<td>( P_1 = .14 )</td>
</tr>
<tr>
<td>Econometrica</td>
<td>( g_2 = 16.8 )</td>
<td>( f_2 = 93 )</td>
<td>( w_2 = .42 )</td>
<td>( P_2 = .22 )</td>
</tr>
<tr>
<td>Economic Inquiry (EI)</td>
<td>( g_3 = 10.4 )</td>
<td>( f_3 = 72 )</td>
<td>( w_3 = .19 )</td>
<td>( P_3 = .13 )</td>
</tr>
<tr>
<td>International Economic Review (IER)</td>
<td>( g_4 = 13.7 )</td>
<td>( f_4 = 68 )</td>
<td>( w_4 = .29 )</td>
<td>( P_4 = .25 )</td>
</tr>
<tr>
<td>Southern Economic Journal (SEJ)</td>
<td>( g_5 = 12.1 )</td>
<td>( f_5 = 88 )</td>
<td>( w_5 = .13 )</td>
<td>( P_5 = .19 )</td>
</tr>
<tr>
<td>Journal of Political Economy (JPE)</td>
<td>( g_6 = 16.6 )</td>
<td>( f_6 = 96 )</td>
<td>( w_6 = .25 )</td>
<td>( P_6 = .12 )</td>
</tr>
<tr>
<td>Quarterly Journal of Economics (QJE)</td>
<td>( g_7 = 16.5 )</td>
<td>( f_7 = 93 )</td>
<td>( w_7 = .5 )</td>
<td>( P_7 = .11 )</td>
</tr>
<tr>
<td>Review of Economics and Statistics (REStat)</td>
<td>( g_8 = 16 )</td>
<td>( f_8 = 86 )</td>
<td>( w_8 = .25 )</td>
<td>( P_8 = .17 )</td>
</tr>
</tbody>
</table>

Source: Columns (1) and (2), Hawkins, Ritter and Walter; columns (3) and (4), editorial offices of various journals.

### Table 2—The Optimal Order of Journal Submission

<table>
<thead>
<tr>
<th>Case</th>
<th>Years to Retirement ( T )</th>
<th>Discount Rate ( r )</th>
<th>Benefit Index</th>
<th>Optimal Order*</th>
<th>Value of Benefits of Optima ( B )</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Professor Seeking Prestige</td>
<td>21</td>
<td>.0822</td>
<td>Prestige: ( g )</td>
<td>1, 2, 8, 6, 4, 5, 7, 3</td>
</tr>
<tr>
<td>2.</td>
<td>Assistant Professor Seeking Prestige</td>
<td>32</td>
<td>.0822</td>
<td>Prestige: ( g )</td>
<td>1, 2, 8, 6, 4, 7, 5, 3</td>
</tr>
<tr>
<td>3.</td>
<td>Professor Seeking Readers</td>
<td>21</td>
<td>.0822</td>
<td>Readership: ( f )</td>
<td>5, 1, 6, 2, 8, 7, 3, 4</td>
</tr>
<tr>
<td>4.</td>
<td>Assistant Professor Seeking Readers</td>
<td>32</td>
<td>.0822</td>
<td>Readership: ( f )</td>
<td>5, 1, 6, 2, 8, 7, 3, 4</td>
</tr>
<tr>
<td>5.</td>
<td>Impatient Assistant Professor Seeking Prestige</td>
<td>32</td>
<td>.1800</td>
<td>Prestige: ( g )</td>
<td>8, 1, 2, 6, 4, 5, 7, 3</td>
</tr>
<tr>
<td>6.</td>
<td>Patient Assistant Professor Seeking Readers</td>
<td>32</td>
<td>.0600</td>
<td>Readership: ( f )</td>
<td>1, 5, 6, 2, 8, 7, 3, 4</td>
</tr>
<tr>
<td>7.</td>
<td>Prestige-Seeking Professor Nearing Retirement</td>
<td>8</td>
<td>.0822</td>
<td>Prestige: ( g )</td>
<td>8, 1, 2, 6, 4, 5, 7, 3</td>
</tr>
</tbody>
</table>

*1, AER; 2, Econometrica; 3, EI; 4, IER; 5, SEJ; 6, JPE; 7, QJE; 8, REStat.
will depend upon the values chosen for \( r \), the discount rate, and \( T \), years until retirement. I have experimented with a variety of possibilities. In Table 2, the first four cases represent the “typical” tenured (cases 1, 3) vs. untenured professor (cases 2, 4) maximizing alternatively prestige and readership. Cases 5–7 show something of the sensitivity of journal choice to changes in both expected retirement age and the discount rate.

The base-case retirement ages used were 32 years for an assistant professor and 21 years for a full professor, based on data in Tuckman and Leahy’s article. The appropriate discount rate is less clear. The discount rate can be thought of as having two parts: a depreciation component representing the rate at which the knowledge embodied in the article obsolesces, and an impatience rate reflecting the anxieties of the author. Lovell has estimated a depreciation rate of 8.22 percent for economic articles; this was used as the base case for both the full and assistant professor examples.

Holding the discount rate and benefit type constant, the optimal strategy for a typical assistant professor and a typical full professor is similar. The \( AER \), the highest prestige journal, is the optimal first choice for both groups; its relatively low acceptance rate and mediocre review time is not sufficient to offset its advantage in prestige points. Perhaps more surprisingly, the \( SEJ \) is the optimal first choice for those seeking to maximize readership. In this case, the \( SEJ \)’s excellent review time and moderate acceptance rates push it over the top despite its middle-of-the-pack familiarity rating. As in the standard labor models, the younger economist gains more from his or her investment than the full professor, since the former has a longer life time over which the benefits may be realized.

The four base cases use a discount rate equal to the rate of obsolescence of knowledge. The typical assistant professor might be expected to be somewhat more impatient than this given the structure of the academic market. In cases 5 and 6, I have experimented with various discount rates to try to dislodge the \( AER \) and the \( SEJ \) from their front-runner positions. Both journals were strongly placed. It took a discount rate of .18 to turn the lead over to \( RESTat \) in the prestige case; only a rate below Lovell’s obsolescence rate dislodged the \( SEJ \). Similarly, in case 7 I experimented with reducing \( T \) until the \( AER \) lost its lead in the readership case. As one might expect, either increasing the discount rate or radically shortening expected life time favors those journals, like \( RESTat \) and \( SEJ \), characterized by relatively high acceptance rates and quick reviews. It appears that, at least in the context of this problem, growing old is rather like becoming an assistant professor again.

Is there any evidence that economists behave as if they were maximizing equation (1)? Full experimental confirmation would require a detailed psychological and demographic profile of all authors who submitted manuscripts to the various journals, along with the order of submission. I offer instead some casual evidence, more easily obtained. The results in Table 2 suggest that very young, impatient assistant professors should prefer submitting manuscripts to either \( RESTat \) or \( SEJ \) over the \( AER \). If the three journals have similar patterns of acceptances across the different age groups, then we should observe a higher frequency of young economists in \( RESTat \) and \( SEJ \). I have calculated for 1977 the percent of articles in the three journals written by economists born after 1947 (30 was rather arbitrarily chosen as young). In fact, as predicted, the \( AER \) had the lowest share of articles from this group: 17.1 percent as opposed to 25.9 percent for the \( SEJ \) and 38.1 percent for \( RESTat \). These patterns may, of course, be reinforced once this article makes apparent to some their inappropriate submission practices.

It is easy to generalize these results using other discount rates, measures of gain, and so on. In fact, the computational problem is easy enough so that the optimal order should always be calculated. Finally, as I am sure it will be asked, I have calculated

\[5\] Only \( AER \) members were counted since the 1974 Directory of Members was used to determine ages.
the optimal order for me, a slightly impatient, prestige seeking assistant professor (r = .15; T = 32). My optimal order is AER, REStat, Econometrica, JPE, IER, SEJ, QJE, EJ. So given the journal you are now reading, you know how many times this paper was rejected.

REFERENCES


