The Review Process in Economics: Is it Too Fast?

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Abstract

Rewards for publications in good economics journals are very high, while submission fees and other monetary costs associated with submitting an existing manuscript are low. Consequently, the editorial delay (especially the first response time – the time until the first editorial decision), by postponing monetary rewards to publication, constitutes the major submission cost (from the author's perspective). Reducing the delay will induce many additional submissions of low-quality papers to good journals, increasing significantly the workload of editors and referees. Moreover, the rejection rate will increase and cause papers to be rejected more times prior to publication, offsetting at least some of the shorter first response times. As a result, the efforts of many editors to reduce the editorial delay, while attracting more submissions to their journals, may have adverse effects from a social perspective, and the optimal delay might be longer than the current average of four months.

1. Introduction

The academic publishing process, and more generally what may be called "the production process of academic research," is an extremely important topic that receives relatively little attention in the academic literature. Ellison (2002a) cites Lucas (1988), who said of economic growth "the consequences for human welfare involved in questions like these are simply staggering: Once one starts to think about them, it is hard to think about anything else." Ellison then adds, "Journal review processes have a large effect on how much progress growth economists make. They also affect the productivity of all other social and natural scientists. One could thus argue that they are an even more important research topic."

The long time it takes an article from its first submission to a journal to its publication is one of the main criticisms of the academic review process in certain disciplines.[1] Especially upset about this long delay are untenured faculty, who need to publish several articles in a few years in order to get tenure. The first response time (the time from submission of the manuscript to receipt of the initial editorial decision about it; henceforth denoted FRT, or FRTs in plural) is a particularly important part of the delay; as opposed to the time it takes to revise the paper or the time from acceptance to publication, the FRT delays all manuscripts submitted, not only the few that are asked to revise and resubmit or the few that are accepted. Consequently, the average paper is delayed by the FRT several times (about 3-6 times according to Azar, 2004).

The long FRT in economics journals (often 3–6 months) seems unnecessary. After all, referees usually do not need more than a few hours to read a paper and write a report on it;

[1] Natural sciences generally have faster review processes than the social sciences; economics is one of the slowest disciplines (see Ellison, 2002b).

neither do editors need much time to make a decision once they obtain the referees' reports. The short FRTs in leading journals in finance and accounting (often 1–2 months) suggest that shorter FRTs are possible. Indeed, editors of many economics journals try to reduce the FRT in their journals. Their motivation may be either altruistic, to benefit the profession, or less altruistic – to attract more submissions and increase the quality of the journal. Whatever the editors' motivation is, most people believe that these efforts are welfare increasing. The article suggests that this common belief is not necessarily correct.

The article makes several main points: first, it stresses the importance of research about the academic publishing process and the profession in general as a tool to making more informed decisions. Research about the review process, for example, may allow us to make better decisions in issues such as the publication delay, submission fees, and single- versus double-blind review. While some studies on the process of academic research were written and even published in top journals[2], the research in this area is scant compared to its importance.

Second, the article argues that the current FRT may be below optimal, so that efforts to reduce it may be counter-productive, even though I claim that reducing the FRT will not harm the quality of the review process. The reason that reducing the FRT may be harmful is that it will increase the number of submissions of low-quality papers to top journals, therefore increasing the workload of referees and editors without any significant benefit in terms of the quality of research published. Moreover, the increased number of submissions will raise the rejection rate and each paper will be rejected more times on average before it is published, so the total time from initial submission to publication may not decrease at all. Finally, I claim that even the ones

[2] See for example Laband, 1990; Blank, 1991; Hamermesh, 1994; Laband and Piette, 1994; Engers and Gans, 1998; Moore, Newman and Turnbull, 2001; Ellison, 2002a; 2002b; Hamermesh and Oster, 2002.

who seem to be the most interested in reducing the editorial delay, namely untenured faculty, may not benefit from such reduction.

2. Are the Efforts to Reduce the First Response Time Beneficial?

The aspect of the review process that receives maybe the most criticism is the long FRT.[3] Authors, especially untenured ones, are upset that it takes several months to get a decision about the submitted manuscript. After all, the refereeing task only takes a few hours. Hamermesh (1994), for example, suggests that it takes six hours to referee an average paper. The *Canadian Journal of Economics* provides advice to referees in which it states "The amount of time taken with a paper can vary enormously – anything from a couple of hours to a couple of days of full-time effort. A typical report should probably take 3 or 4 hours."[4]

If it takes only a few hours to referee a paper, why does it take several months to get a decision? While it takes editors time to choose referees and to reach a decision based on the referees' reports, and mail to and from referees takes time, the main reason seems to be that it takes the referees a long time to return their reports. This long time is usually not because the referees need a lot of time to ponder about the paper, but because papers wait a long time to be read. In Franklin Fisher's words, "Such a paper is delayed not because a referee is taking three months to decide on it but because it is sitting in a pile on his or her desk" (Shepherd, 1995, p. 103). This may be the result of the referee having higher-priority tasks, of procrastination, and

[3] In what follows, I sometimes use "editorial delay" or just "delay" rather than "FRT," but they all mean the same thing.

[4] See on-line at http://economics.ca/cje/en/referees.php.

maybe of fear that prompt response will result in additional refereeing assignments too soon (see Thomson, 2001, p. 116).

The delay caused by the refereeing process makes the dissemination of research slower, and this is particularly important because new research builds on previous one, so any delay causes the entire chain of research to be delayed. Moreover, when it takes a long time from writing an article to its publication, this reduces the chances that a policy-oriented article will be published in time to be relevant, deterring economists from writing such papers (see Borts, 1981). These costs of the delay brought several economists to suggest ways to reduce the delay (see Hamermesh, 1994; Pressman, 1994; Szenberg 1994). Editors often express their desire to shorten the review time (see Ellison, 2002a).[5] Their reason, however, is often to attract authors rather than the profession's welfare (see Stulz, 2000).

Are the efforts made by editors and others to shorten the FRT beneficial from a social point of view? Most scholars think that the answer is positive, as this enables faster dissemination of knowledge. The few who think that making the delay shorter is not necessarily beneficial usually argue that shortening the delay will reduce the quality of the review. This argument, however, is hard to settle with the fact that most of the delay is caused when the manuscript just waits to be read.

A more substantiated argument about positive relationship between the review quality and the time it takes is provided by Hamermesh (1994). He presents evidence that heavily-cited economists need three more weeks to referee papers compared to the average referee and three and half more weeks compared to the least-cited referees. In addition, Hamermesh assumes that heavily-cited economists give better feedback than their less-cited colleagues. This assumption is

[5] See also the editors' message of the *Review of Economic Studies* at http://www.restud.com/report.htm.

an interesting topic for empirical research, because leading economists are probably busier and may put less time in writing the report, possibly leading to less helpful feedback. Given his assumption, however, Hamermesh calls the additional delay (the extra three weeks of using heavily-cited referees) "the implicit price of quality in the market for referees' services." Yet, even if heavily-cited referees do provide better feedback, this does not mean that shortening the delay requires the use of less-qualified referees. After all, even heavily-cited referees may be able to reduce the time papers spend in the pile waiting to be read. Indeed, Hamermesh also does not see the current delay as a necessary cost of quality refereeing process, but rather suggests a few ways to reduce the review time.

Even though I claim that shortening the delay need not reduce the quality of the review process, I argue that a shorter delay is not necessarily better. The reason is rooted in the special structure of costs and benefits in the academic profession. Basically, the idea is that the private cost to submit an existing manuscript to another journal is negligible compared to the private benefits from a publication in a good journal. This cost is also much smaller than the social cost of the review process. As a result, authors have an incentive to submit their manuscript to many more journals than a social planner would like them to. Authors do not internalize the costs that they impose on editors and referees when they submit a paper. The FRT is an additional submission cost from the author's perspective, and it therefore increases the private costs of submission, reducing the number of submissions and alleviating the workload on editors and referees. As a result, given the current submission fees, shortening the editorial delay without taking measures to prevent excessive submissions may in fact reduce social welfare.[6] In the

[6] For a discussion of several potential measures to reduce the FRT while preventing frivolous submissions, see Azar (2005).

following sections I elaborate on these points, using empirical evidence about the costs and benefits of submitting manuscripts to journals.

3. Why Does a Lower First Response Time Lead to More Submissions?

To show why a lower FRT leads to more submissions, I present a simple model about how the optimal submission strategy is determined. The optimal submission strategy is a very complicated problem to solve analytically, so to make the model traceable I use almost the simplest framework possible, and ignore interesting issues such as the differences in FRTs between journals (for a discussion and empirical analysis of the optimal submission strategy see Oster, 1980).

Assume that for a certain manuscript, there is a finite set of journals that may publish it, and that they can be ranked according to their quality, where quality is determined according to the gains of an author from having a publication in the journal. Denote the number of relevant journals by K, and let 1 be the highest-quality journal, 2 the second highest and so on. Let G_i be the present value of the gains from having a paper accepted by journal i (the i-th best journal), for example increased salary (the gains from publications are discussed in detail in the following sections). By definition, $G_1 \geq G_2 \geq \ldots \geq G_K$.

The author can rank the quality of his paper, where quality J means that the paper will surely be accepted by journals J, J+1, … , K. Clearly, the author will never submit the paper to the journals J+1, J+2, …, K, since he is better off submitting to journal J, and the paper is then accepted for sure. There is also a positive (but smaller than 1) probability that the paper will be accepted in journals better than J; the probability of acceptance of a quality-J paper in journal i is denoted by $q_i(J)$. By definition, $q_i(J) = 1$ for all $i \geq J$.

For simplicity I assume that $G_1q_1(J) \geq G_2q_2(J) \geq \ldots \geq G_{J-1}q_{J-1}(J)$. It may be, however, that $G_Jq_J(J)$ (which is equal to G_J) is higher than $G_{J-1}q_{J-1}(J)$, and even higher than $G_1q_1(J)$. I also assume that each submission has a cost of $c < G_K$. Let us define $\delta = 1 / (1 + \text{interest rate})^d$, where d is the FRT. Assuming that the author submits the manuscript to the next journal immediately after receiving a rejection, the time between subsequent submissions of the manuscript is equal to d. It follows that δ is the discount factor according to which the author discounts the payoff from the next submission.

Since both G_i and G_iq_i are non-increasing in i for all $i < J$, the author's optimal strategy is to submit the paper first to the best m journals in a decreasing order ($0 \leq m \leq J-1$), and then to journal J. This strategy has the obvious stopping rule: once the paper is accepted at a certain journal, the author does not submit it anymore. To find the optimal value of m, the author first considers two options: (A) Submit the manuscript immediately to journal J; (B) Submit the manuscript first to journal 1 and if rejected to J. If the utility from (A) exceeds that from (B), the optimal action is to submit the manuscript to J. On the other hand, if the utility from (B) exceeds that from (A), it is better to submit the manuscript first to 1 (but not necessarily to then submit to J if it is rejected). The utility from (A) is $G_J - c$, while the utility from (B) is $-c + q_1(J)G_1 + (1 - q_1(J))\delta(G_J - c)$, so it is optimal to submit immediately to J (to choose $m = 0$) if and only if $G_J \geq q_1(J)G_1 + (1 - q_1(J))\delta(G_J - c)$.

Similarly, if the author submits to journal 1 and receives a rejection, he compares the utility from submitting to J immediately and submitting first to 2 and if rejected to J. Submitting to J at this point (i.e. choosing $m = 1$) is optimal if and only if $G_J \geq q_2(J)G_2 + (1 - q_2(J))\delta(G_J - c)$. We can analyze the optimal decision at any point in a similar fashion. The result is that the author submits to journal i rather than to J as long as

(1) $$q_i(J)G_i + (1 - q_i(J))\delta(G_J - c) > G_J,$$

and once this inequality is violated for a certain journal i, he submits the paper to J.[7]

Given the value of G_J, if the value of $q_i(J)G_i + (1 - q_i(J))\delta(G_J - c)$ is increased for all i, the number of journals that the author tries before submitting to J (which we defined as m) is also (weakly) increased. One way to increase the value of $q_i(J)G_i + (1 - q_i(J))\delta(G_J - c)$ for all i is to reduce c. This implies that if the submission cost is reduced, the author chooses to submit his paper to more top journals before submitting it to the journal where it is accepted for sure. The same idea applies to the FRT, which can be thought of as the time cost of submission. Since $q_i(J)G_i + (1 - q_i(J))\delta(G_J - c)$ is increasing in δ, it is decreasing in d. It follows that a shorter FRT (lower d) causes m^* (the optimal value of m) to be higher.

In addition, the average number of submissions is increasing in m. To see this, notice that the expected number of submissions is equal to $n(m) = q_1 + 2(1 - q_1)q_2 + 3(1 - q_1)(1 - q_2)q_3 + \ldots + [m + 1](1 - q_1)(1 - q_2)\ldots(1 - q_m)$ (using q_i rather than $q_i(J)$ to simplify the notation). It is immediate that n(m) is increasing in m, and therefore $n(m^*(d))$ is decreasing in d, implying that lower FRTs increase the number of submissions.

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[7] If the inequality (1) is satisfied for journal z and is violated for journal z+1, it is also satisfied for journals 1, 2, …, z–1, and is also violated for z+1, z+2, …, J–1. This follows from the fact that $q_i(J)G_i + (1 - q_i(J))\delta(G_J - c)$ is decreasing in i for all $i < J$. To see this, consider two journals x and y, where $x < y < J$. We want to show that $q_x(J)G_x + (1 - q_x(J))\delta(G_J - c) \geq q_y(J)G_y + (1 - q_y(J))\delta(G_J - c)$. If $q_x(J) \leq q_y(J)$, this follow immediately (recall that $c < G_K < G_J$ and $q_x(J)G_x \geq q_y(J)G_y$). If $q_x(J) \geq q_y(J)$, notice that $q_x(J)G_x + (1 - q_x(J))\delta(G_J - c) \geq q_x(J)G_y + (1 - q_x(J))\delta(G_J - c) \geq q_y(J)G_y + (1 - q_y(J))\delta(G_J - c)$, where the first inequality follows from $G_x \geq G_y$ and the second inequality follows from $q_x(J) \geq q_y(J)$ and $G_y \geq G_J > \delta(G_J - c)$.

The fact that the number of submissions is decreasing in the FRT suggests that there is a cost to shortening the FRT, namely the opportunity cost of the time of referees and editors. It does not imply necessarily that short FRT is not beneficial. The optimal FRT depends on the magnitude of the social benefit from early publication and the social cost of the refereeing process, taking into account which manuscripts will be submitted under different FRTs. The next section presents some evidence about the costs and benefits of submissions that helps to evaluate whether the current FRT is optimal.

4. Costs and Benefits of Submissions

4.1 Private Benefits From a Publication

What are the returns to publication? The returns in form of satisfaction, pride, social status and the like are important without doubt, but I have no way to evaluate their monetary value. I will therefore consider only the monetary rewards to publication. This implies that in practice authors are more willing to submit their papers to top journals than the analysis here suggests. On the other hand, when considering the costs of submission, I do not include the psychological disutility from getting a rejection. Again, this is not because I think that this cost is not important, but because I have no way to estimate its magnitude. Ignoring this cost implies that the author is less willing to submit his work to top journals than is suggested by the analysis. The two biases, however, are in opposite directions; if they are roughly at the same magnitude, the analysis below is not too biased. The analysis thus follows most of the economic literature by ignoring psychological costs and benefits and focusing on monetary gains and costs.

In addition, since I present all the steps in the analysis, the interested reader can perform similar computations adding what he thinks are the psychological benefit from a publication in a

top journal and the psychological cost of receiving a rejection. Using reasonable values, I do not think that the main results of the analysis change significantly. An interesting idea for future research, however, is to interview professors at different stages of their career about their monetary evaluation of the psychological disutility from receiving rejection letters or the psychological utility from having a publication in various journals.

What are the monetary returns from publications? Moore, Newman and Turnbull (2001) examined how salaries of US economics professors are affected by publications and other variables. They estimated that a publication in the top 10 journals in economics (level 1) accounts for a 2.9 percent increase in salary, a publication in level-2 journals (ranked about 11 – 55) increases salary by 1.7 percent, and other publications increase salary by 0.1 percent. The true contribution to salary is slightly higher, however, because of the additional effect of citations on salary.[8]

Sauer (1988) obtains similar results; his numbers already include the effect of citations on salary. According to his study, publication in the top journal is worth an increase of 3.8 percent in salary, and publications in the journals ranked as 10^{th}, 20^{th}, 40^{th} and 80^{th} are worth 61.6, 53.1, 34.1, and 18.9 percent of the value of publication in the top journal. Combining the results of the

[8] Each career citation adds 0.1% to salary, but the product [citations * total articles] has a negative effect on salary. Taking the sample averages and assuming (in the absence of better information) that level 1 and 2 articles generate citations by the same rate, and that publications in other journals do not generate citations, I find that citations increase the effect of a level-1 or level-2 publication by 0.1% (of salary) for a full professor and 0.3% for an associate professor.

two studies, and defining level 3 to be journals ranked 56-100, publications in level 1, 2 and 3 result in about 3, 1.7, and 0.7 percent increase in salary (including citation effect).[9]

The next obvious question is "three percent of how much?" Deck, Collins and Currington (2002) report the results of questionnaires sent to various institutions regarding salary for new hires at different levels. The average salaries offered to new hires in the levels of assistant professor, associate professor (with tenure) and full professor in the 2001-2002 academic year were $62,680, $84,018, and $132,421. Assume that the average salary of a professor that still publishes on a regular basis is $90,000, that he has 30 more years to receive salary, and that his annual discount rate is 6 percent. A publication in level 1, 2 and 3 then increases annual salary by $2700, $1530 and $630; the present values of the life-time increase in earnings are $37,165, $21,060 and $8,672.

4.2 Private Costs of Submissions

What are the costs to submit an existing manuscript to a journal? These costs have three main parts: the time required for printing and mailing the manuscript, the submission fee, and the monetary value of the time lost in the refereeing process. With today's technology, printing three or four copies of the manuscript, writing a cover letter and mailing them can be done in half an hour. The marginal cost of time for different authors is different, but if we assume that it is $50 per hour, the time costs of printing and mailing are about $25.

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[9] Similarly, Price and Razzolini (2002) estimate wage equations from censored salary data generated by grant applications submitted to the National Science Foundation Economics Program. A publication in the top six economics journals increases salary by 0.5 – 3.6% (in the various specifications), and a publication in any economics journal increases salary by 0.2 – 0.5%.

What are the submission fees to journals today? Those differ significantly between journals, even when comparing journals at about the same level. Table 1 presents data about submission fees in different journals. Since many journals give a discount to members of the relevant association or to subscribers of the journal, I present data on membership / subscription fees as well. The data is taken from the websites of the journals or from recent issues of the journal. As can be seen in the table, submission fees in the economics journals in the sample are at most $100 for subscribers and $175 for non-subscribers. The comparison with the related fields of accounting and finance is interesting, since journals in these two fields charge much higher submission fees.

The value of time lost in the refereeing process (from the author's perspective) depends on the FRT. Not many journals provide this important information; going over dozens of journals, however, I found a few journals that do. In addition, Ellison (2002a) provides information about the *QJE* and the *JPE*. Table 2 presents the FRT in these journals, ranked according to the median FRT for new submissions (the mean when the median is unavailable). The average of the mean FRT in the top five journals (*AER, Econometrica, JPE, QJE, and REStud*) is 126 days (taking in the *QJE* the number for all papers), or about four months, and in the other economics journals the number is similar. I present data about the FRT in finance and accounting journals because the comparison to economics journals raises the puzzle why the difference is so big (this is a good topic for future research). Taking four months as the average FRT, the monetary cost of the editorial delay is about one third of the annual increase in salary following publication. Taking again a salary of $90,000, this is about $900, $510 and $210 for articles that are eventually published in journals of level 1, 2 and 3. It follows that the editorial delay is the major submission cost in economics journals.

4.3 Social Cost of Submissions

The social cost of a submission is mainly due to the time editors and referees spend on the paper. Usually a paper is sent to two referees. As was mentioned earlier, Hamermesh (1994) estimates that it takes six hours to referee an average paper, while the *Canadian Journal of Economics* notes that it may take between two hours and two full days, and estimates it on average to be three to four hours. Averaging the two estimates, I assume that it takes each referee five hours of work to read the paper and write the report.

I did not find any source that estimates the time it takes editors to handle a paper. The editor has to get an idea what the paper is about, find appropriate referees and send them the paper, evaluate their reports, and make a decision about the paper. When the decision is "revise and resubmit," the editor may want to make clear which of the referees' comments he deems important. In the absence of a better number, I will assume that it takes the editor about an hour to handle an average paper until the first editorial decision is mailed to the authors. There are also overhead costs of the journal; some of these costs, however, such as the printing and circulation of the journal, are caused by the publication of accepted articles and not by the refereeing process. Again, it is hard to come up with a good number for the overhead costs; I will assume it is around $50 per manuscript submitted, on average.

The next question is how much the time of the referees and the editor is worth. I will stick to the previous number of $50 per hour. This is for example the average salary per hour of a professor who is paid $90,000 for nine months and works 200 hours a month. Multiplying 11 hours by $50 and adding the overhead costs suggest that handling a submission has opportunity costs of about $600.

4.4 Social Benefits From a Shorter First Response Time

The benefit from reducing the editorial delay is that it enables to disseminate research faster. This is particularly important since new research uses previous results, so any delay also defers subsequent research. Today, with the availability of working papers on the Internet, some argue that the role of journals in disseminating information is reduced. While this is probably true, I do not think that it is reduced to zero. The reason is that publication in a good journal is a signal that the article is of high quality, and a signal about quality is very important information, as it allows readers to avoid reading low-quality research.

It will be too heroic to try to come up with monetary social values for different editorial delays. We have to remember, however, that the FRT is only one part of the delay between a finished manuscript and its publication. This delay also includes the time it takes to revise the paper, to re-evaluate the revised version (these two steps may occur more than once, especially in top journals; see Ellison 2002a; 2002b), and the time between acceptance of the paper and its publication.[10]

Ellison (2002a) reports that in the top five general-interest journals the average submit-accept time was 21.9 months in 1999. In other general-interest journals and field journals it was 16.7 and 15.3 months, respectively. Trivedi (1993) provides information about the time from acceptance to publication, which was 9.4 months on average in his sample. Therefore, a paper

[10] The time to evaluate the revised paper depends on the editor and sometimes also on the referees (when the editor asks for their advice on the revised paper). This time should be as short as possible; the cost of delaying the dissemination of new research still exists at this point, but the benefit of deterring excessive submissions by means of editorial delay does not, because these submissions are of papers that the editor does in fact want to publish.

that appears in a top-five journal takes about 31 months from submission to publication, while in lower-quality journals it takes about 6 months less.

Shortening the FRT from four to two months, for example, will therefore shorten the total delay by only 6.5 percent in a top-five journal and by 8 percent in other journals when the delay is computed in the publishing journal only. The FRT is more important, however, if we take into account that papers may be rejected a few times prior to publication. For example, if papers are rejected on average twice before they are accepted, and the author submits the paper to the next journal immediately after receiving a rejection (which is optimal, unless the author wants to revise the paper significantly), we should add twice the FRT to get the total time from first submission to publication. This results in 39 months for a top-five journal and about 33 months for other journals. Shortening the FRT from four to two months then shortens the total delay by six months, or 15.4 percent for a top-five journal and 18.2 percent for other journals. The effect of shortening the FRT by 50 percent is therefore much lower than 50 percent when looking at the total delay, even when accounting for the possibility that a paper is submitted to more than one journal before it is accepted.

5. Optimal Submission Strategy

The optimal submission strategy in general is a complicated problem. If there were only 100 journals, one would have more than 100! (100 factorial) different ways to choose the submission list (there are 100! combinations to make an ordered list of 100 journals, plus numerous other combinations to submit to less than 100 journals). To solve the problem accurately, one needs to know for each journal the benefit from publication, the cost of submission, the editorial delay and the acceptance chances, as well as the time until retirement

and the discount rate of the author in order to compute the value of each possible submission sequence (see Oster, 1980). The complexity is yet higher if one wants to account for the fact that rejections also change the estimates of the acceptance chances in other journals (and the information embedded in receiving a rejection is different for the different journals).

As a result, I take a simpler approach: I compute costs and benefits of submission approximately, to get an idea about who finds it optimal to submit papers to top journals under different editorial delays. Doing so is somewhat tricky, because the quality of the paper affects its acceptance chances and also its submission cost (through the time cost of the editorial delay, as was explained before). So we have to divide the discussion according to where the paper is likely to be published eventually, because this affects the submission cost. I assume for simplicity that all journals in the same level (according to the division to three levels mentioned before) have equal acceptance chances and benefits from publication.

Let us consider for a moment only papers that for sure will be published eventually in either a level-1 or a level-2 journal. The cost of the editorial delay for the author is somewhere between \$510 and \$900, depending on the probability that the paper will eventually be published (potentially after several submissions) in a level-1 journal (the higher this probability is, the closer the cost is to \$900). The present value of a publication in a level-1 journal is higher than that of a level-2 journal by \$16,105. Assume that the submission fee is \$50. Adding the \$25 printing and mailing time cost, the total submission cost is therefore less than \$975. This implies that papers with chances of 6.1 percent or more to be accepted by a level-1 journal (in a single submission, not the chances of eventual publication after a sequence of submissions) should submit to a level-1 journal, because 0.061*\$16,105 = \$982 > \$975. We can go one step further, however, by examining the eventual probabilities of publication of a paper with 6.1 percent to be

accepted in a level-1 journal. If such a paper is submitted to all ten level-1 journals sequentially, it has a probability of 53 percent (0.939^{10}) to be rejected from all of them. So the delay cost for such a paper is not \$900 but rather 0.53*\$510 + 0.47*\$900 = \$693; together with the submission fee and mailing costs, the total submission cost is \$768. This implies that any paper with chances of 4.8 percent (\$768/\$16,105) or more to be accepted by a level-1 journal should submit to the top journals. We can now repeat the process of re-computing the eventual publication chances, the delay cost, and so on. The result is that any paper with chances of 4.5 percent to be accepted by a level-1 journal should submit to the top journals.

We can also perform the same computation from the other side – assume that the delay cost is only \$510, compute the cut-off probability for submitting to top journals (\$585/\$16,105 = 3.6%), re-evaluate the delay cost in light of this probability, and so on. The result is the same cut-off of 4.5 percent. This is the cut-off for the first submission; as the paper is rejected from level-1 journals, the cut-off decreases gradually toward 3.7 percent. For example, in the tenth submission to a level-1 journal, there are no more level-1 journals left, so the delay cost for a paper with 4-percent chances of acceptance to level 1 is 0.96*\$510 + 0.04*\$900 = \$526, implying total cost of \$601 and a cut-off probability of \$601/\$16,105 = 3.7 percent.

The reader might think that 4.5 percent is a very small chance, and that someone who only evaluates his chances of acceptance as 5 or 6 percent probably gives up submission to a top journal. But acceptance rates in the top five journals are about 9 percent[11]; since the average

[11] The *AER* publishes the acceptance rate in the annual editor's report, and had 10.3 percent in 2001. For the other journals I computed the acceptance rates by dividing the number of articles published in 2001 (according to Journal Citation Reports) by the number of annual submissions. *Econometrica* received 517 new submissions during the year 7/1/2000 – 6/30/2001 (see the editor's report in the January 2002 issue) and published 66 articles (12.8

paper has a probability of 9 percent to be accepted, papers that are below the average quality of papers submitted have less than 9 percent chances and yet they are submitted, suggesting that the cut-off of 4.5 percent may be a reasonable approximation for the actual behavior of many authors.

5.1 How Do Different Delays and Submission Fees Affect the Cut-off Probability?

We can perform the same analysis as in the previous subsection to compute the cut-off probability when the delay is changed. For example, if the delay is only two months, the cost of the delay is $450 and $255 for papers that are eventually published in level 1 and 2 journals. In addition, we can change the submission fee and see how this affects the cut-off probabilities. Table 3 reports the cut-off probabilities for different values of the FRT and the submission fee.

6. First Response Times and the Number of Submissions

If submission fee on average is $50, how do different FRTs affect the behavior of authors? Suppose that we could reduce the FRT to only two months. We see from Table 3 that the cut-off probability will change from 4.5 percent to 2.3 percent. What does it mean in terms of the number of submissions? Since acceptance rates in the top five journals are around 9 percent

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percent). The *REStud* received 419 new submissions during the year 3/2000 – 2/2001 (the data is from the journal's website) and published 36 articles (8.6 percent). The *JPE* received 608 submissions in 2000 and published 44 articles (7.2 percent). The *QJE* received 684 submissions in 1998 and published 42 articles (6.1 percent). The number of submissions to the *JPE* and the *QJE* appears in a graph in Ellison (2002a); I thank Glenn Ellison for providing me the exact numbers.

and in the next five around 16 percent, it probably means many more submissions.[12] The reason is that the distribution of the quality of papers is very skewed. Consider a typical top-five journal with a 9-percent acceptance rate and 630 submissions (this is approximately the average number of submissions in the top five journals). Suppose that the articles that were in fact accepted for publication had ex-ante acceptance chances of 40 percent. These articles constitute 9 percent of the submissions. Since the average (over all papers) ex-ante acceptance chances are 9 percent (the acceptance rate of the journal), the average ex-ante acceptance chances for the rest of the submissions (denoted by p) must satisfy $0.09*0.4 + 0.91*p = 0.09$, so $p = 0.059$. That is, the average ex-ante acceptance probability of almost 600 papers that were not accepted eventually is 5.9 percent.

If the distribution of acceptance chances of rejected papers is symmetric, there are about 300 submissions with ex-ante acceptance rates below 5.9 percent, and above 4.5 percent (the cut-off probability). If it is not symmetric, as is more likely, there are many more than 300 submissions with ex-ante acceptance probability of 4.5–5.9 percent. For example, we assumed that the papers accepted had a 40 percent ex-ante probability. This implies that there are many more papers with similar probability that were rejected. For every 40-percent-chance paper that

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[12] The five journals that are included in level 1 in Moore, Newman and Turnbull (2001) and not in the top five mentioned before are *REStat, EJ, JET, Economica and IER*. I could not obtain recent data about acceptance rates in these journals, but Miller and Punsalan (1988) report the following acceptance rates from about 15 years ago: REStat – 15%, EJ – 15%, JET – does not appear, Economica – 16%, IER – 20%, implying 16.5% on average. To judge according to the top five journals, acceptance rates today may be slightly smaller; the average of the top five in Miller and Punsalan is 10.6% (the breakdown is: AER – 13%, Econometrica – 8%, JPE – 11-20%, QJE – 8-9%, REStud – 8.2%).

was rejected there have to be about 24 papers with a 4.5-percent acceptance probability to keep the average of 5.9 percent for rejected papers.

It is only reasonable then that there are several hundreds of papers with ex-ante acceptance probability of 2.3–4.5 percent that were not submitted when the delay was four months, but will be submitted with a two-months delay. For example, if the density of papers with quality such that they have acceptance chances of 2.3–4.5 percent is the same as in the range of 4.5–5.9 percent, and if 400 submissions have acceptance chances of 4.5-5.9 percent, then shortening the delay to two months will result in 400*(4.5–2.3)/(5.9–4.5) = 629 more submissions to each journal! If the distribution of paper quality is skewed with higher density in the lower end, as is more likely, the increase in the number of submissions can be much higher.

I do not claim that the computations performed represent accurately the behavior of authors or the conditions in the market for journal publications. I had to ignore certain aspects of the real world for the analysis to be traceable (as is usually the case in economics). In some cases the absence of data (about the opportunity cost of time, the distribution of quality of papers and so on) required me to provide some reasonable guess and discuss it. But I believe that the important points that the analysis makes are valid, and changing the assumptions to other reasonable assumptions will not change these results significantly: first, given the nominal submission fees, the editorial delay is the major cost of submission (this result is even stronger if we consider the case of untenured faculty). Second, the small chances of acceptance in top journals together with the high submission cost (because of the editorial delay) bring many authors of mediocre papers to give up the idea to submit to top journals. Reducing the delay will reduce the cost of submission and cause many additional submissions of papers that were not submitted to top journals before. The same thing will happen to lower-quality papers that today

are submitted to level-3 journals, but will be submitted to level-2 journals if the delay becomes significantly shorter.

7. Are First Response Times Shorter Than Optimal?

The costs of a shorter FRT are the increased number of submissions and the resources (mainly time of referees and editors) needed to handle them. If the FRT is reduced by a half, each top journal will receive hundreds of additional submissions that previously were not submitted to it, and level-2 journals will receive submissions that were previously targeted at lower-quality journals. The total number of additional submissions handled by all journals can easily be several thousands each year and even more. If the social cost of handling each submission is about $600, reducing the editorial delay from four to two months is likely to cost a few millions of dollars per year. Is this a reasonable price to pay for reducing the FRT by two months, and the total publication delay by a few months (depending on how many times we think papers are rejected before being accepted)? I leave this judgment to the reader. It is hard to compare money to delay, however. It might be easier to judge if we first translate the money amount to additional positions for economics professors. If the cost of employing an average professor is $120,000 (salary + benefits + cost of office and so on), then 200 additional submissions are equivalent to the cost of an additional professor. If we think that shortening the FRT will result in 8,000 additional submissions each year, the choice is between reducing the FRT and 40 economics professors.

There are additional important points in favor of a high FRT, however. Since a reduced FRT will increase the number of submissions to top journals, acceptance rates will drop and papers will suffer more rejections before they are published. The time they spend being rejected

from journals increases the total publication delay and may offset and even exceed the time saved by shortening the FRT. As a result, we may not only increase the workload of referees and editors, but also increase the total time that a paper spends from its initial submission to its publication. Moreover, the increased number of submissions is likely to lead journals to use less qualified referees, and referees to spend less time reviewing each submission, both reducing the quality of the refereeing process.

Of course, there are many other issues involved. If referees give helpful comments also to rejected papers and if authors revise their papers accordingly, the social cost of the refereeing process may be lower than was computed before. On the other hand, maybe shortening the delay will induce authors to submit their papers in an earlier stage and with a lower quality than they do today. If authors know very little about the quality of their papers and referees are very accurate in their evaluation, inducing more people to submit to top journals will increase the quality of top journals (some cases in which good papers are not submitted to top journals will be eliminated), improving the matching between article and journal qualities. If authors have good idea about the quality of their papers and referees make some mistakes, however, more submissions of low-quality papers (induced by a shorter FRT) can actually reduce the average quality of top journals and hurt the sorting function of journals.

Overall, I think that with the existing submission fees, shortening the FRT may not be beneficial because of its effect on the submission cost and the number of submissions. I discussed the example of shortening the FRT to two months, but similar analysis with similar results can be performed on different FRT-targets. We can also ask the question whether we may need to increase the FRT. Increasing it to six months, for example, will raise the cut-off probability to 7.1 percent (only authors who think their papers have at least 7.1 percent

acceptance chances in a top journal will submit to such journals) compared to a cut-off of 4.5 percent with the current FRT of four months. This will reduce significantly the number of papers submitted to the top journals. Similarly, papers that are sent to level-2 journals but have only small acceptance chances may now be sent directly to level-3 journals, reducing the number of submissions again. Since the submissions that will be eliminated are those of authors who think they have very small acceptance chances, the number of good papers that will not be submitted to top journals is likely to be very small. Also, the reduced number of submissions will increase acceptance rates and reduce the average number of times papers are rejected prior to publication, offsetting some, and maybe all, of the increase in the delay from first submission to publication. Even if the effect of the higher FRT is not completely offset by the decrease in rejections, however, the significant reduction in the workload of referees and editors may justify the small increase in publication delay. This implies that the current FRT may be smaller than optimal, and the efforts to reduce the FRT may be efforts in the wrong direction.

A conclusion that a market in equilibrium is not efficient usually requires additional explanation. In the case of the review process, however, prices do not reflect marginal costs and many prices are missing altogether, and authors, editors and referees impose externalities on each other and on readers. Submission fees are much lower than the social cost of submission, the rewards to publication are not equal to the social benefit, and referees are rarely compensated for their work, to name a few examples. It is therefore not surprising that the market may not be efficient. One particular reason that might lead to the FRT being less than optimal is the competition between journals. If all top journals increase the FRT, then most of the papers that will no longer be submitted to top journals are those that were rejected anyway. But if only one top journal increases its FRT, it is likely to lose good papers to the competing top journals. While

the increased FRT will reduce the workload of the editors and referees of the journal, it will also reduce the quality of the papers published, and therefore editors are not likely to take such action.

8. What about Untenured Faculty?

Another interesting point is about the interests of untenured faculty. Since they have a ticking tenure clock over their heads, it seems intuitive that they want the FRT to be as short as possible, so that they can have more publications before the tenure decision is made. This intuition is wrong, however. First, the number of articles that appear in top journals does not change as a result of a change in the FRT, so it cannot be that everyone will publish more. What may happen is that untenured faculty will be able to afford more trials in top journals before they refer to lower-quality outlets, and therefore a shorter FRT may be beneficial for their publication records (at the expense of tenured faculty, since it is a zero-sum game – tenured and untenured faculty compete for a fixed number of top-journal articles). The benefit is not going to be high, however, because the higher number of submissions to top journals will reduce the acceptance rate, increasing the average number of submissions prior to acceptance, and therefore offsetting some, or all, of the shorter publication delay due to the shorter FRT.

Even if a shorter FRT increases the number of top-journal articles published by untenured faculty, however, it does not help them to get tenure. The reason is that untenured professors compete among themselves. The decision how many publications and in which journals are good enough to get tenure is not a decision made in heaven. If assistant professors will be able to publish more than they do today, the number of publications required for tenure will increase as well (see Pressman, 1994). So even though untenured professors may have more publications by the time they are up for tenure, their relative ranking may not change, and this ranking is what

determines who gets tenure where. Even if the ranking will change from some reason, for every winner there will also be a loser; obviously, not all untenured professors can improve their relative ranking compared to others in the same group.

Another reason that untenured faculty will not benefit from a shorter FRT is that it will increase their refereeing workload. Editors are limited in their use of experienced and well-known economists as referees, and will respond to an increase in submissions by asking younger economists to serve as referees more often (especially given that the additional submissions will be of relatively low-quality papers). After all, untenured professors have the most interest to retain the editor's good will (in case the editor is asked to write a letter on them when they are up for tenure, for example), so they are the least likely to refuse to referee a paper.

9. Conclusion

After discussing briefly why it is important to do research on the academic publishing process, I focused on one aspect of the process – the FRT. In light of recent efforts by editors of various journals to reduce the FRT, I examine whether doing so is socially beneficial. I argue that given the small costs of submitting an existing manuscript to a journal, the editorial delay constitutes the major submission cost. Since the rewards to publication in top journals are very high, a reduction in the editorial delay and therefore in the submission cost will induce many more submissions of lower-quality papers to top journals. This has large costs in terms of the additional time that editors and referees will have to invest to handle these papers. Moreover, an increase in submissions will increase the rejection rate and the average number of times that a paper is rejected before being published. As a result, the total time from the submission to the

first journal till publication (potentially in a different journal) may not decrease much and may even increase.

The conclusion is that given the submission fees that economics journals charge today, the efforts of editors to reduce the FRT, while promoting the interest of the journal to attract authors, may be socially undesirable. In fact, it may be that even the current FRT (about four months) is shorter than optimal. I also explain why even untenured faculty will not benefit from a reduction in the editorial delay.

I started by saying that research on the academic publishing process is important, and I will end by suggesting a few ideas for future research. Some ideas are policy oriented. One such idea is to examine the optimal mix of submission fees and editorial delays. Can we reduce the FRT and prevent excessive submissions by charging a high submission fee? Also interesting is how much time the referees should invest in suggesting improvements to a paper they recommend to reject. On one hand, the comments may be helpful because the paper is likely to be published eventually (in another journal) and if the author revises it to include the referees' comments, the paper presumably will be better (see Laband, 1990 on the added value of referees' comments).[13] Since the referee reads the paper anyway, it seems a waste not to let the author know how the paper can be improved (although it takes some time to come up with specific

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[13] While most authors are rational enough to incorporate referees' comments at least when they receive an invitation to resubmit the paper, not everyone thinks this really improves the paper. Paul Samuelson, for example, says (Shepherd, 1995, p. 20): "I have learned from experience not to argue with or ignore referees' comments and criticisms; but in my heart of hearts I question that, *net*, they have improved the merits of my papers' contents or expositions." It should be noted, however, that even if referees' comments did not improve Samuelson's papers, they might still improve the papers written by the rest of us…

ideas and write them down clearly). On the other hand, if rejected papers receive very helpful feedback from referees, this may encourage authors of bad papers or papers that are not yet ready for publication to submit their papers to journals just to get some helpful feedback.

Another line of research is to explore empirically the review process. Knowing more about the process is essential in order to make better decisions about if and how it should be changed. How many times is a paper rejected on average before being accepted? What portion of the editorial delay is caused by referees and what portion by editors?[14] How much time does it take referees to review a paper and write the referee report? Do more experienced scholars write better reports, or maybe since they are busy they write less helpful reports? To what extent do authors revise a rejected paper according to the referee's report before sending it to another journal? How similar are the reports by different referees on the same paper? Compared to the importance of the subject, so little work was done that the opportunities for future research are abundant. Such research can suggest changes that will improve the way the academic system is managed, increasing the productivity of professors and the contribution of the academic world to society.

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[14] Ellison (2000) presents data about the breakdown of submit-accept times between editors and referees in the *JPE*, but I am not aware of any such data about other journals.

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Table 1

Submission Fees in Various Journals

(1) The Journal	(2) Submission fee – members / subscribers	(3) Submission fee – others	(4) Cost of annual membership / subscription in the US	(5) (2) + (4); this is an alternative fee to (3)
Economics Journals				
AER	$75	$150	$61 - $86	$136 - $161
Canadian J. Econ.	$25	$65	$40	$65
Econometrica	$0	$0	$59	$59
Economica	$0	$40	$40	$40
Economic Inquiry	$100	$160	$60	$160
Intl. Econ. Review	$55	$120	$66	$121
J. Econ. Theory	$0	$0	$95	$95
J. Labor Econ.	$0	$0	$52	$52
J. Math. Econ.	$0	$0	$115	$115
J. Monetary Econ.	$100	$175	$95	$195
JPE	$50	$50	$50	$100
QJE	$0	$0	$44	$44
RAND J. Econ	$50	$85	$60	$110
REStat	$0	$50	$53	$53
REStud	$0	$0	$54	$54
Southern Econ. J.	$50	$75	$50	$100
Accounting Journals				
The Accounting Rev.	$75	$100	$85	$160
J. Acc. & Econ.	$250	$300	$70	$320
J. Accounting Res.	$200	$200	$99	$299
Finance Journals				
J. Finance	$70	$140	$80	$150
J. Financial Econ.	$400	$450	$95	$495
Rev. Financial Stud.	$125	$175	$45	$170

The data was taken from the journals' websites in 2003.

Table 2

First Response Times (FRT) in Various Journals (in Days)

	Median FRT	Mean FRT	Period	Source / journal issue	Comments
Economics Journals					
Quarterly Journal of Economics	NA	47	1997	Ellison (2002a).	All papers.
		114			Accepted papers only.
		82			Papers sent to referees.
Canadian Journal of Economics		91	1/1/02-12/1/02	The journal's website.	
Journal of Economic History	103	108	2000/2001	September 2001.	Including re-submissions.
Southern Economic Journal	107	122	2001	October 2002.	New submissions only.
American Economic Review	109	122	7/1/00-6/30/01	May 2002.	Rejected papers only.
Econometrica	110	122	2000	January 2002.	New submissions only.
	98	92			Revisions only.
	108	122			All papers.
Economic Journal	137	137	2000	RES Newsletter (Jan 2003).	All papers.
	137	125			Letters advising rejection.
	168	188			Letters inviting revision.
European Economic Review	143	165	2000	May 2002.	
The RAND Journal of Economics	153	131	2000	Summer 2002.	Simple average of the four quarters of the year.
Economic Inquiry	NA	159	1/1/02-4/15/02	October 2002.	
Journal of Political Economy	NA	167	2000	Ellison (2002a).	
Review of Economic Studies	175	171	9/2000-2/2001	The journal's website.	New submissions only.
	194	198			First revision.
	159	138			Second revision.
Accounting Journals					
The Accounting Review	51	52	3/1/01-2/28/02	July 2002.	Including re-submissions.
Journal of Accounting and Economics	52	53	12 months ending 4/2002	August 2002.	
Finance Journals					
Journal of Financial Economics	37	43	10/2001-9/2002	The journal's website.	
The Journal of Finance	39	44	3/1/00-7/31/02	The journal's website.	Including re-submissions.

Additional details about the computations performed (in those cases that the journals publish the distribution rather than the mean or median) can be obtained from the author upon request.

Table 3

Optimal Submission Strategy - Cut-off Probabilities

Fee / Delay (months)	$0	$50	$100	$150	$200	$250	$300	$350	$400
0.04	0.2%	0.5%	0.8%	1.1%	1.4%	1.7%	2.1%	2.4%	2.7%
1	1.0%	1.3%	1.7%	2.0%	2.3%	2.6%	3.0%	3.3%	3.6%
2	2.0%	2.3%	2.6%	3.0%	3.3%	3.7%	4.0%	4.3%	4.7%
3	3.0%	3.4%	3.7%	4.1%	4.4%	4.8%	5.1%	5.5%	5.8%
4	4.2%	4.5%	4.9%	5.3%	5.6%	6.0%	6.3%	6.7%	7.1%
5	5.4%	5.8%	6.2%	6.5%	6.9%	7.3%	7.6%	8.0%	8.4%
6	6.7%	7.1%	7.5%	7.9%	8.2%	8.6%	9.0%	9.3%	9.7%
8	9.6%	9.9%	10.3%	10.7%	11.1%	11.4%	11.8%	12.2%	12.5%
10	12.5%	12.9%	13.3%	13.7%	14.0%	14.4%	14.8%	15.1%	15.5%
12	15.6%	16.0%	16.3%	16.7%	17.0%	17.4%	17.8%	18.1%	18.5%