# **Editorial Favoritism**

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Abstract

This paper develops a model of the research production and publication process that can explain editorial favoritism, defined as more lax journal acceptance criteria for one group of authors than for another. I study two interpretations of the model. In the first, the distribution of author abilities differs between two groups and favoritism arises as a form of statistical discrimination. Under plausible conditions, tightening journal standards lead to increased favoritism, and the favoritism can be salutary in that it spurs a larger volume of "high impact" papers. The second interpretation imbues referees with a more active role in editorial decision-making, and can also explain the emergence of editorial favoritism despite optimizing editors and common abilities of authors in the two groups. Here, favoritism is not a form of statistical discrimination and often leads to the production of fewer high impact papers. Editors are shown to assign referees that are from the same group as the author, and to give greater editorial scrutiny to papers submitted by the disadvantaged group. Both models reveal symptoms of editorial favoritism that have implications for empirical testing.

> "I have had papers turned down, but very few economics papers. Most of my economics papers have been published by journals edited by close friends, and in many of these cases there weren't even formal submissions." Judge Richard Posner (quoted by Gans and Shepherd, Journal of Economic Perspectives, 1995)

## I. Introduction

It is hard to find an economist (or doubtless a scholar in another field) who lacks an opinion on the subject of editorial favoritism. Anecdotes abound and passions are high, particularly among those (like me) who are not associated with the elite institutions of our profession. There is a sense among many that favoritism is getting worse, that elite journals are increasingly inaccessible to those "outside the club," and that editors from elite institutions give their students and peers opportunities in the elite journals that would never be available to outsiders (Bardhan, 2003). Is this just the grumbling of frustrated, jealous and perhaps undeserving authors? Or is editorial favoritism actually being exercised? If there is favoritism, is it a bad thing? Does it imply that lower quality papers are occupying the scarce space of the top journals? Does it imply that academic incentives for high quality research are impaired (for the unfavored)?

In this paper, I attempt to address some of these questions by constructing theory to explain the practice of editorial favoritism. The theory permits us to identify forces that may drive editorial favoritism, as well as its effects on (i) authors in different (favored vs. unfavored) groups, (ii) the production of high quality research papers, and ultimately, (iii) economic welfare derived from the publication process. It also delivers some insights into the nature of an editorial process driven by virtuous and optimizing editors, including the process by which referees are chosen and the extent to which editors scrutinize referee recommendations

Despite apparent professional interest in editorial favoritism – at least judging from the popularity of conversation on the subject – there has been strikingly little related research. To my knowledge, this is the first effort to attack the subject on a theoretical level. In doing so, I build on the key work of Ellison (2002a), who provides the first coherent model of the editorial process. I thus borrow a number of features of Ellison's model, including his distinction between two quality attributes of author papers (q and r) that are the result of author effort (although I provide somewhat different interpretations to these attributes). I also borrow Ellison's posited criterion for an Editor's decision-making. Crucially, however, my model differs from Ellison's in order to focus attention on prospects for editorial discrimination between different groups of authors and referees. Ellison is interested in the lengthening of the review process and evolving standards for article attributes (including length, citation of references, etc.), and thus focuses on standards for paper revisions; as a result, he does not model different author/referee groups that are, of course, central to my inquiry. In essence, Ellison abstracts from any heterogeneous treatment that might arise in the editorial process because this is not his main focus, whereas I abstract from the revision process because this is not my main focus.

In this paper, I do not provide empirical evidence on the presence or absence of editorial favoritism per se. However, the theory has implications for how one might go about testing for the presence of favoritism. Current evidence on this subject is mixed. Casual empiricism is suggestive, but certainly far from conclusive (Bardhan, 2003). As indicated in Table 1, the top three American economics journals have recently seen an increase in the concentration of authors from top institutions. This increase is particularly noticeable for the *Quarterly Journal of Economics*, where the top four institutions accounted for over 43 percent of pages during the 2000-2003 period, with Harvard and MIT authors alone responsible for over 28 percent of pages; these percentages appear to represent historic highs.

However, current econometric evidence – admittedly indirect – does not confirm the presence of favoritism. For example, in her study on the effects of double-blind vs. single-blind reviewing in the AER, Blank (1991) compares impacts on authors from institutions of different rank. One might expect, if there is editorial favoritism exercised by referees, that double-blind reviewing would reduce acceptance rates for top ranked institutions and raise them (at least relatively speaking) for lower ranked institutions. Blank's conclusions are mixed on this front. Authors from the very top ranked institutions saw no decline in their acceptance rates as a result of double-blind treatment. However, authors from middle-ranked institutions (rank 6-50) saw significant reductions in acceptance rates, while authors from lowest-ranked institutions (rank over 50) saw no significant reduction. There is, of course, the potential for the Editor – as well as the referees – to play a role in providing more favorable editorial treatment to high rank institutions; this role may conceivably explain the failure of double-blind reviewing to affect AER acceptance rates for authors from these institutions. This role for the Editor is also crucial in the theory developed in this paper.

In a famous study, Laband and Piette (LP, 1994) provide more direct evidence on editorial favoritism. The authors posit two competing arguments about the relationship between paper quality and an author's ties to editorial decision-makers. The first is that editorial favoritism (due to author/editor ties) leads to lower quality papers; specifically, "Editors may publish substandard papers written by their personal friends or professional allies" (LP, 1994). The second is that Editors seek out high quality papers, implying an opposite direction of effect: author/Editor ties will lead to higher quality papers. LP provide an empirical test of these competing predictions by examining the effect of author / editorial board ties on an article's subsequent citations (the presumed measure of article quality) using a cross section of 1051 articles in 28 economics journals in 1984. In more recent work, Medoff (2003) provides a similar test, with important twists, using a cross-section of 359 articles in 6 core economics journals in 1990. Both of these papers find evidence of a significant positive relationship between an author's connection with editorial decision-makers and subsequent citations. These results are interpreted as evidence against editorial favoritism.[1]

The theory in the present paper, however, predicts that favored groups will typically supply higher quality papers; this is (in part) precisely because these groups are favored and, as a result, enjoy higher rewards to quality production. The evidence of LP and Medoff (2003), therefore, is consistent with the presence of editorial favoritism.[2]

In what follows, I develop a model of editorial favoritism that has two variants. The first is a model of statistical discrimination in which two groups have different distributions of author ability. Higher ability authors can produce higher quality papers with less cost. In the model, editors and referees have imperfect information about paper quality, but know an author's group. Referees provide a signal of one aspect of quality, and editors accept papers which have the highest estimated quality. In the equilibrium, quality hurdles for publication are higher for the disadvantaged group (that with the inferior distribution of ability). Here the discrimination is driven by higher estimated production of unobvserved quality attributes by the favored group. Such discrimination is akin to statistical discrimination in labor and insurance markets (see, for example, Milgrom and Oster, 1987). The model enables us to study effects of tightening journal

[1] Ellison (2002b) studies whether the review process in top economics journals has become more democratic over time, which might explain longer publication lags. One potential indicator of favoritism (an undemocratic process) is reduced submit-accept times for high status authors. Ellison finds no statistically significant links between indicators of author status in any of the past three decades (1970's, '80's, and '90's). For the 1990's, however, he does estimate a negative relationship between three key indicators of author status and publication lags.

[2] There is quite a rich empirical literature on various aspects of the editorial process, including work on the slowdown of economics publishing (Ellison, 2002b), the referee process and anecdotes of luminaries (Gans and Shepherd, 1995; Hammermesh, 1994; Laband, 1990), changes in article quality over time (Laband, Tollison, and Karahan, 2002), trends in topical coverage and coauthorship (Laband and Wells, 1998), impacts of author order on article quality (Joseph, Laband and Patil, 2005), intellectual collaboration and coauthorship (Laband and Tollison, 2000). See also Azar's (2005) recent paper arguing that the slowdown in the referee process can be beneficial, essentially because it deters frivolous submissions to high tier journals.

standards – due to increased demand for scarce journal space – on the extent of favoritism, as well as the effect of the favoritism on the production of "high impact" papers (arguably the most important component of economic welfare derived from the publication process). I find that tightening standards over time leads to an increased extent of editorial favoritism; however, favoritism is, under some conditions, salutary in that it leads to greater numbers of high impact papers.

In a second model variant, there is no basis for statistical discrimination as authors in both groups have identical abilities. However, referees from the two groups can differ in the extent to which they are "tough" or "kind." In this model, the Editor makes accept/reject decisions based on both a referee's recommendation to reject, and the referee's assessment of paper quality. When a referee's propensity to be tough increases with the likelihood of rejection, and the Editor chooses the proportion of each group's papers to send to referees from the same group, I find that an asymmetric equilibrium can arise even though the two groups are identical apriori; in this equilibrium, one group is subject to a higher quality hurdle for publication than is the other; has a higher proportion of tough reviewers; and is more subject to its own group's tough reviewers. In this setting – in contrast to that with statistical discrimination – editorial favoritism is, under plausible conditions, no longer salutary in the sense that it leads to smaller numbers of high impact papers (vis-à-vis a symmetric outcome with no editorial discrimination). Also interesting are implications of this model for an Editor's optimal rules for editorial management. Not only will an Editor tend to favor the "kinder" group by sending more of its authors' papers to its own group's referees; he or she will also tend to give these authors the benefit of the doubt in two senses: he/she will reevaluate negative recommendations of "tough" group referees *more* often for "kind" group authors than for "tough" group authors; and he/she will reevaluate positive recommendations of "tough" group referees *less* often for "kind" group authors than for "tough" group authors.

## II. The Core Model

There are two journals, one high tier (H) and the other low tier (L). Payoffs to publication are higher in H (more later). Authors each write one paper per period, and choose two quality attributes of their paper.

The first quality attribute, r, affects the likelihood of publication; referees observe a signal of this attribute in the review process. The r attribute may incorporate innovation on the existing literature, quality of exposition, robustness of empirical findings, generality of theoretical results, the scope of exposited extensions, and so on.

The second quality attribute, q, reflects fundamental and deep innovativeness that ultimately will determine the extent to which the paper influences the state of knowledge and thought within the broader profession. This attribute is assumed to be unobservable at the time of paper submission (although inferences can be made from an author's group membership about the likely q investment made by the author). This assumption is motivated by common claims and perceptions that the innovativeness of the most innovative papers is not appreciated in the referee process (see Gans and Shepherd, 1995).[3] In the future, papers will become high impact or not, with a probability that depends upon both the outlet in which the paper is published and the author's investment in q quality. High (long term) impact is rewarded in the academic marketplace. I assume

[3] For example, Graciella Chichilnisky writes (Gans and Shepherd, 1995): "The more innovative and interesting the paper, the more likely it is to be rejected, in my experience."

that high impact occurs only in the H journal, and does so with probability f(q), where $f_q>0$, $f_{qq}< 0$, and $f_{qqq}\leq 0$.[4]

Author (utility) payoffs from publication in H and L journals are $U_H$ and $U_L$, respectively, where $U_H > U_L$ (there is a higher payoff to H publication). In addition, if a paper becomes high impact, the present value author payoff is $U_q$. Hence, in total, we have

(1) Utility to H publication = $U_H + f(q)\, U_q = U_{H^*}$.

Because the payoff to H publication is higher, all authors first submit their paper to H, and then if rejected, submit to L.

An author's production of both q and r quality can be stochastic. I interpret q and r as "mean quality" choices and implicitly incorporate randomness of q production in the probability function f(q). For r, I assume that realized r quality is

(2) $\tilde{r}(r,\varepsilon) = r + \varepsilon$ ,

where ε is a random variable assumed (for simplicity) to be uniform on $[-\underline{\varepsilon},\underline{\varepsilon}]$ and, implicitly, to be independent of q production.[5]

Authors each have an ability a, which takes one of two possible values, $a\in\{l,h\}$; l denotes low ability and h>l denotes high ability. An author's cost of quality (in utility units) is c(q,r,a), which is assumed increasing and convex in (q,r), with $c_{rq}$ bounded below.[6] Higher ability lowers the cost of quality: $c_a<0$, $c_{ra}<0$, $c_{qa}<0$.

[4] The analysis is easily extended to allow for a positive but lower probability of high impact in the L journal.
[5] Randomness in r is important to motivate the review process, which in turn provides incentives for r production.
[6] I assume that $c_{rq}\geq -gU_qf_q(q)$ for relevant (r,q) (bounding $c_{rq}$ below) and that c has non-negative third derivatives.

Each author is in one of two groups, indexed 0 (for “out of network”) and 1 (for “in network”). The number of authors in group $i \in \{0,1\}$ is $N_i$, and the fraction of high ability authors in group $i \in \{0,1\}$ is $\gamma_i \in (0,1)$.

In the high tier journal (H), space is constrained to a given number of papers. The Editor observes an author’s group membership $i \in \{0,1\}$. The referee observes and reports a signal of r quality. For simplicity, I assume that this signal is perfect, equal to true quality $\tilde{r}$.[7] In a single-blind review process, the referee might use information about the author’s group membership to adjust the report of r quality. For example, the group membership may give the reviewer a prior (rational) expectation of average r, and the referee’s report may give positive weight to this prior expectation. Accounting for such effects provides an additional source for editorial favoritism in the analysis that follows, and does not alter any qualitative conclusions. I therefore abstract from these effects, as would be appropriate in a completely effective double-blind review system.

The Editor accepts or rejects based on his/her $(i, \tilde{r})$ information. Specifically, for quality q, the Editor has an expectation of the (distribution of) q investments. Let $F_i$ denote the Editor’s expectation of the likelihood of “high impact” by an author in group i. In equilibrium, this expectation will be consistent / rational,

$$F_i = \gamma_i f(q_{hi}) + (1- \gamma_i) f(q_{li}) \tag{3}$$

where $q_{ai}$ = equilibrium q of author with ability a in group i. The Editor selects papers for publication that have estimated expected quality above a standard z. The Editor weights

[7] Underpinning the Editor’s interest in the referee’s reported signal of r is the correlation between the signal and the true r value. In Model below, it is only important that the correlation be positive, so that the signal is informative. In Model 2, allowing for imperfect correlation complicates the mathematics of optimal editorial rules, but does not alter their underpinning logic. I therefore focus on the case of perfect signals for simplicity.

q-quality with $\alpha \in (0,1)$ and r-quality with weight $(1-\alpha)$ (following Ellison, 2002a). Hence, a paper is accepted when

$$\alpha F_i Q + (1-\alpha)\ \tilde{r}(r,\varepsilon) \geq z, \tag{4}$$

where Q = quality assignment to "high impact." (4) implies the acceptance criterion,

$$\text{Accept} \Leftrightarrow \tilde{r}(r,\varepsilon) \geq [z - \alpha F_i Q]/(1-\alpha) \equiv W_i \tag{5}$$

$$\Leftrightarrow \varepsilon \geq W_i - r,$$

(5) gives the author's probability of acceptance,

$$P_H(r,W_i) = \text{probability of acceptance in H} \tag{6}$$

$$= 1 - G(W_i - r) = g\,(\underline{\varepsilon} + r - W_i),$$

where G is the distribution function for ε and the last equality is based on the assumed uniform distribution for ε, with $g=(2\underline{\varepsilon})^{-1}$. Note that $W_i$ is the crucial index of editorial favoritism, with a lower hurdle (W) associated with more favorable treatment.

In equilibrium, z will be selected to exactly fill the journal,

$$\sum_{i=0}^{1} N_i \{ \gamma_i P_H(r_{hi},W_i) + (1-\gamma_i) P_H(r_{li},W_i) \} = K = \text{journal capacity} \tag{7}$$

where, from (1), (3), (5) and (6),

$$W_i = [z/(1-\alpha)] - [\alpha Q/(1-\alpha)]\,[\gamma_i f(q_{hi}) + (1-\gamma_i) f(q_{li})] \tag{8}$$

Because our primary interest here is in access to the high tier (H) journal, I will treat the low tier editorial process as simply as possible. Specifically, the probability of publication in L is $P_L \varepsilon (0,1]$, a constant.[8]

The order of the game is as follows: (1) The H journal standard z is determined (to satisfy (7)). (2) Authors each choose (q,r). (3) All authors submit to H. (4) Referees

[8]A more general treatment – contained in an expanded version of this paper – allows $P_L$ to depend upon r, $P_L=P_L(r)$ with $P_L' \geq 0$.

report $\tilde{r}$ values to the H Editor. (5) The H Editor accepts / rejects according to equation (4). (6) Rejected authors submit to L, where each submitted paper is accepted with probability $P_L$. (7) Nature determines the "high impact" of published papers (as described above). (8) Author utilities are realized.

III. Author Quality Choices

Given an author's W and ability a, his/her choice problem is:

$$(9) \quad \max_{q,r} J(r,q;a,W) = P_H(r,W)(U_H+f(q)U_q) + (1-P_H(r,W))P_L U_L - c(r,q,a).$$

Corresponding first order conditions are:

$$(10) \quad r: J_r = (\partial P_H/\partial r)( U_H+f(q)U_q - P_L U_L) - c_r = 0$$

$$(11) \quad q: J_q = U_q P_H f_q(q) - c_q = 0$$

where $(\partial P_H/\partial r)=g$.[9] The solutions to (10)-(11) can be denoted r(a,W) and q(a,W). In equation (10), the author trades off marginal benefits of r in increasing the probability of publication in H (which yields the net gain, $U_{H^*}-P_L U_L>0$) and L, against the marginal cost of r, $c_r$. In equation (11), the author trades off the marginal benefit of q in increasing the probability of "high impact" (and associated utility $U_q$) against its marginal cost, $c_q$.

Unless r and q are strong substitutes in production ($c_{rq}>>0$), r and q are complementary in the sense that

$$(12) \quad J_{rq} = U_q\, g\, f_q - c_{qr} > 0,$$

[9] To ensure positive and bounded solutions to (10)-(11), I assume that, for relevant (r,q,a), $c_r(0,q,a) = c_q(r,0,a) = 0$, $c_r(r^+,q,a)$ and $c_q(r,q^+,a)$ are arbitrarily large for bounded $r^+>0$ and $q^+>0$. For analytical convenience, I also ensure a probability of H publication strictly interior to the unit interval by assuming the following: $\underline{\varepsilon}\geq z/(1-\alpha)$ (implying a positive $P_H$ even when r and q are zero), and $\underline{\varepsilon}\geq r^+ - \bar{V}$ (implying $P_H<1$ even when $r=r^+$ and $q=q^+$), where

$$\bar{V} = [z/(1-\alpha)] - [\alpha Q/(1-\alpha)]f(q^+).$$

Finally, to ensure satisfaction of second order conditions, I assume that $J^*= J_{qq}J_{rr} - J_{rq}J_{rq}>0$, which holds if c() is convex (as assumed) and g is sufficiently small ($\underline{\varepsilon}$ sufficiently large).

In this case, if r is higher, marginal incentives to produce q are higher and vice versa. Why? A higher r leads to a higher probability of publication in H which in turn raises the expected return to q. Conversely, a higher q yields a higher payoff to publication in H (and L), thereby increasing the incentive to raise publication probabilities by raising r.

A competing case – also worth considering – is that of strong substitutes, when $c_{rq}$ is very large (positive) so that authors face relatively strong tradeoffs between q and r: either produce a "risky" (high-q) paper or a "safe" (high-r) paper, but not both. In this case, $J_{rq}$ is negative.

Two comparative statics effects are of interest. First, higher ability a implies:

(13a) $$dr/da \overset{s}{=} -J_{qq}J_{ra} + J_{rq}J_{qa}$$

(13b) $$dq/da \overset{s}{=} -J_{rr}J_{qa} + J_{rq}J_{ra}$$

where $J_{qq} \overset{s}{=} J_{rr} < 0$ (from second order conditions), $J_{ra}=-c_{ra}>0$, and $J_{qa}=-c_{qa}>0$.

Lemma 1: (A) If q and r are weak substitutes ($J_{rq}>0$), then higher ability authors produce higher q and r quality. (B) If q and r are strong substitutes ($J_{rq}<0$) and ability has relatively small effects on marginal costs of producing r ($c_{ra}$ is small), then higher abilty authors produce higher q quality and lower r quality.

For higher ability authors, marginal costs of r and q are lower, favoring higher levels of quality. Complementarity of r and q in production ($J_{rq}>0$) reinforces these direct effects of ability on r and q. However, strong substitutability ($J_{rq}<0$) can counter the direct effects, leading to opposing net effects. With ability plausibly having a larger impact on author costs of "deep innovation" (q), higher ability can lead to substitution, that is, a higher q and lower r.

Second is the effect of higher W. Recall that W measures the extent of editorial bias against an author. That is, a lower W – due to an author's group affiliation – implies a higher probability of publication in H.

(14a) $$dr/dW \overset{s}{=} -J_{qq}J_{rW} + J_{rq}J_{qW} \overset{s}{=} J_{rq}J_{qW} \overset{s}{=} -J_{rq}$$

(14b) $$dq/dW \overset{s}{=} -J_{rr}J_{qW} + J_{rq}J_{rW} \overset{s}{=} -J_{rr}J_{qW} < 0$$

where $J_{rW} = 0$, and $J_{qW} = -U_q\, g\, f_q < 0$.

Lemma 2. $dq/dW < 0$. $dr/dW < (>) 0$ when q and r are complements (strong substitutes), $J_{rq} > (<) 0$.

A lower W, by raising the probability of H publication, raises incentives for investment in q. Higher q investments in turn promote higher r investments when the two quality types are complementary ($J_{rq} > 0$), but lower r investments when the two are strong substitutes ($J_{rq} < 0$).[10]

While more favorable editorial treatment (lower W) favors more q production, these "returns" to favoritism are generally diminishing. Driving these diminishing returns are declining benefits of marginal q investments in raising the likelihood of "high impact" ($f_{qq} < 0$).[11]

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[10] I have abstracted from three complexities: (i) the probability of L publication may depend positively on r, $P_L = P_L(r)$; (ii) there may be a positive (but lower) probability of high impact in the L journal, so that we have f(q,H) and f(q,L)<f(q,H); and (iii) ε may not be distributed uniformily. The comparative statics with respect to ability (Lemma 1) generalize directly. The effect of W (favoritism) on q is more complicated. Suppose that ε is distributed symmetrically about zero, with a decreasing density for ε>0. Then sufficient for dq/dW<0 is that (i) $-J_{rr} \geq J_{rq} \geq 0$ (r and q complementary), (ii) $U_q f^*_q - P_L' U_{L^*} \geq 0$, whre $f^*_q = f_q(q,H) - P_L f_q(q,L) > 0$ and $U_{L^*} = U_L + f(q,l) U_q$, and (iii) the probability of H publication is less than one-half. While (ii)-(iii) are quite weak requirements, the case of strong substitutes ($J_{rq} < 0$) is arguably worth considering. Sufficient for dq/dW<0 in this case is (ii) $-J_{rr} \geq -J_{rq}$, and (ii) ε uniform. However, the possibility of dq/dW >0 cannot be ruled out; for example, if $J_{rr} \approx J_{rq} < 0$ and ε has a triangular density on $[-\underline{\varepsilon}, \underline{\varepsilon}]$, then dq/dW>0 if $P_H \leq 2(U_{H^*} - P_L U_{L^*})/(U_q f^*_q + P_L' U_{L^*})$, as will be true (for example) if $P_L' = 0$, $f_q(q,H) \leq f(q,H)$ and $P_H \leq 2(1 - P_L)$.

[11] If q and r are complementary ($J_{rq} > 0$), then the following is sufficient for the diminishing returns of Lemma 3: $c_{rrr} \overset{s}{=} c_{qqq} \overset{s}{=} c_{rqq} \overset{s}{=} c_{rqr} \geq 0$, as assumed (note 6). If q and r are strong substitutes ($J_{rq} < 0$), then either of the following is sufficient: (i) $c_{rrr} = c_{qqq} = c_{rqq} = c_{rqr} = 0$, OR (ii) $c_{rqr} >> \max(c_{rqq}, c_{rrr}) \geq 0$ and $c_{qqq} \geq 0$.

Lemma 3. The following is sufficient for $\frac{d}{dW}\left[\frac{dq(a,W)}{dW}\right] < 0$:

$$c_{rrr}(J_{rq})^2 + 3\, c_{rr}\,(c_{rr}\, c_{rqq} + J_{rq}\, c_{rrq}) \overset{s}{=} J_{rq} \text{ (or = 0).}$$

IV. Model 1: Editorial Favoritism as Statistical Discrimination

For model 1, I assume that the in-network group 1 has a higher fraction of high ability members, $\gamma_1 > \gamma_0$. For example, one may think of the "in-network" group as the set of talented Ivy League scholars.

*A. Favoritism*. Plugging q(a,W) and r(a,W) (from (9)-(11)) into (8) gives the equilibrium condition for W, given z and γ:

(8') $W = V(W,z,\gamma) \equiv [z/(1-\alpha)] - [\alpha Q/(1-\alpha)]\,[\gamma\, f(q(h,W)) + (1-\gamma)\, f(q(l,W))]$

To ensure uniqueness and differentiability of the equilibrium, I assume

Assumption 1. For relevant (W,z,γ), $V_W()<1$.[12]

Lemma 4. Equation (8') defines a unique stable equilibrium, W*(z,γ).

Editorial favoritism is defined as a bias (R) that depends upon an author's group membership. For example, if an author is a member of the high-γ "in-network" group 1, does he/she enjoy more favorable editorial treatment than if he/she were a member of the lower-γ "out-of-network" group 0, $W^*(z,\gamma_1)<W^*(z,\gamma_0)$?

Proposition 1. (A) There is editorial favoritism in equilibrium, $dW^*(z,\gamma)/d\gamma < 0$. (B) Higher/tighter publication standards (z) reduce the extent of favorable bias for all groups, $dW^*(z,\gamma)/dz > 0$. (C) However, if $\frac{d}{dW}\left[\frac{dq(a,W)}{dW}\right] < 0$ for relevant W (Lemma

[12] Assumption 1 is satisfied (for example) if $V_{WW}>0$, which implies a unique solution to (8') at which $V_W<1$. The premise of Lemma 3 in turn implies that $V_{WW}>0$.

3), then tighter publication standards lead to a greater extent of editorial favoritism,

$$\frac{d}{dz}\left[\frac{dW^*(z,\gamma)}{d\gamma}\right] < 0.$$

The intuition for editorial favoritism (Proposition 1(A)) is as follows: Higher ability authors produce higher q-quality papers. Because the "in-network" group is blessed with a higher fraction of high ability authors, editors can infer that, on average, the q-quality of their submissions will be higher, leading to editorial bias in their favor. This editorial favoritism in turn has incentive effects, generally favoring higher q qualities and higher or lower r qualities. These incentive effects feedback in the equilibrium, leading to even more divergence between the inferred q-quality of "in-network" and "out-of-network" groups.

Note that editorial favoritism is generally associated with higher paper quality. A lower W for the favored group is associated with higher average q quality, and often higher r quality as well, due to both the higher average ability of the favored group and the incentive effects of the favoritism. Hence, the empirical claim that an author's editorial connection is associated with a higher quality of publication (LP, 1994; Medoff, 2003) is consistent with the presence of editorial favoritism.

Consider next the effects of tightened standards due, for example, to increased competition for access to the H journal. Tightened standards are achieved by lowering acceptance probabilities across the board (Proposition 1(B)). However, if there are diminishing marginal returns to quality ($d^2q/dW^2<0$), then tightened standards increase the extent of editorial favoritism (Proposition 1(C)). With diminishing returns, an author's marginal response to W (in lowered quality) is smaller if he/she is a high ability / low W author that produces higher quality. Hence, when W's go up, due to the tightening in z standards, there is a greater effect on authors with low ability and/or high W. Because the "out-of-network" group has more low quality authors and faces a higher W, their quality levels fall more on average; this leads in turn to a greater rise in the equilibrium W for this group – as a function of its authors' average quality choices – than for the "in-network" group. The result is an increased divergence between the equilibrium W's of the two groups.

Note that, as editorial standards (z) tighten, authors respond to the higher W hurdles by lowering q-quality (with $dq/dW<0$) and lowering (raising) r-quality as $dr/dW < (>) 0$. However, tightening standards over time need not be associated with lowered quality production, even when $dq/dW \overset{s}{=} dr/dW < 0$. Suppose that the source of change is an increase in reward to H publication ($U_H$). In this case, the direct effect of the higher $U_H$ is generally to elevate incentives for (q,r) quality production. The offsetting indirect effect is due to the resulting increased competition for H journal space, which leads to tightening z standards and an attendant lessening of (q,r) production incentives. Under some conditions, the direct effect dominates the indirect effect.[13]

*B. Welfare.* How does editorial favoritism affect economic welfare? For simplicity, I will focus on only one aspect of welfare (arguably the most important): the average number of "high impact" papers:

$$n_Q(W_0,W_1) = \sum_{i=0}^{1} N_i \sum_{a=l}^{h} \gamma_{ai}\, P_H(r_{ai},W_i) f(q_{ai}) \tag{15}$$

where $\gamma_{hi}=\gamma_i$, $\gamma_{li}=(1-\gamma_i)$, $r_{ai}=r(a,W_i)$, $q_{ai}=q(a,W_i)$. The question of interest is this: Subject to H journal capacity, what choices of $W_i$'s maximize $n_Q$? In particular, does editorial favoritism ($W_0>W_1$) increase or decrease the number of high impact papers?

[13] This is true, for example, if $f_{qq}(q)\approx c_{rrr}()\approx c_{qqq}()\approx c_{rq}()\approx 0$ for relevant (q,r) (and $a\in\{l,h\}$)

The journal capacity constraint on the "editorial favor indexes," $(W_0,W_1)$, is:

$$(16) \qquad \sum_{i=0}^{1} N_i \sum_{a=l}^{h} \gamma_{ai}\, P_H(r_{ai},W_i) = K = \text{journal capacity}$$

Differentiating (16) gives:[14]

$$(17) \quad dW_1/dW_0 = -\{ N_0 \sum_{a=l}^{h} \gamma_{a0}\, [1-(dr(a,W_0)/dW)]\}/\{ N_1 \sum_{a=l}^{h} \gamma_{a1}\, [1-(dr(a,W_1)/dW)]\} < 0,$$

Hence, $dW_1/dW_0<0$; if one increases editorial favor to one group, one must lower the favor to the other group in order not to exceed journal capacity.

Differentiating (16) with respect to $W_0$, where $W_1=W_1(W_0)$ from (17), gives us:

Proposition 2. Suppose that $f_{qq}(q)\approx 0$ and c is quadratic (with zero third derivatives). Then editorial bias in favor of group 1 ($W_0>W_1$) increases the number of high impact papers. Formally, for $W_0\geq W_1$, $dn_Q(W_0,W_1(W_0))/dW_0>0$.

Lowering W has two general types of effect on expected q production. First is a "portfolio effect." A lower W increases the probability of H publication, which increases the chance that the high impact (q) component of a paper is "discovered." Because higher-$\gamma$ groups have higher q's on average (even with the same W, and even more with lower W), this effect is greater for these groups.

Second are two "incentive effects," both due to the positive impact of a lower W on q production. For the first, let us hold constant (for the moment) the incentive effect of lower W on q production. Because higher ability authors have higher probabilities of H publication, benefits of given increases in q – in expected "high impact" – are greater for higher ability authors. Hence, these benefits are higher, on average, for higher-$\gamma$

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[14] The inequality in (17) follows from: $1-(dr(a,W)/dW)) \overset{s}{=} J^*-J_{rq}J_{qW} = J^*+ J_{qr}(J_{qr}+c_{rq}) = (J_{rr}J_{qq} - c_{rq}^2)- c_{rq}J_{qW} > -c_{rq}J_{qW}$, where the inequality follows from convexity of c and $f_{qq}<0$. The first right-hand term is positive if $J_{rq}\geq 0$, and if $J_{rq}<0$ (requiring $c_{rq}>0$), the last term is positive.

groups that have a higher fraction of high ability authors. However, the second incentive effect can be offsetting; the marginal effect of lower W on q production is (under some conditions) less for higher ability / low W authors. When the second incentive effect is not present (as is true under the prior conditions of Proposition 2), then incentive benefits of lower W in producing greater expected "high impact" are larger for the high-$\gamma$ group, and we have a coincidence of "portfolio" and "incentive" effects. In this case, editorial favoritism produces a higher number of high impact papers.

V. Model 2: An Active-Referee Theory of Favoritism

Suppose now that there is no asymmetry in the ability distributions of the two groups, $\gamma_0=\gamma_1=\gamma$. Indeed, we can assume (without loss) that there is only one common author ability, $\gamma \varepsilon \{0,1\}$. However, let us also suppose that referees play a more active role in editorial decision-making. Specifically, as before, a referee observes r quality, $\tilde{r} = r + \varepsilon$. However, now if the referee is from group j, she recommends outright rejection if

$$r + \varepsilon < w_j + \tilde{v} \tag{18}$$

where $w_j$ is the referee's assessment of the H journal standard, based on his/her group j experience (more in a moment), and $\tilde{v}$ takes one of two possible values, depending upon whether the referee is "tough" or "kind." If the referee is "tough," then $\tilde{v} = v_+ > 0$; in this case, the referee recommends rejection unless the estimated paper quality is at least $v_+$ above the inferred journal standard. Conversely, if the referee is "kind," then $\tilde{v} = -v_- < 0$; in this case, the referee recommends rejection only if estimated quality is at least $v_-$ below the inferred journal standard. The proportion of tough referees in group i is $\eta_i$. For the moment, I assume that group 0 has a higher fraction of tough referees $\eta_0 > \eta_1$.

If a referee does not recommend rejection, he/she reports $\tilde{r}$ to the Editor. The Editor rejects papers recommended for rejection. If rejection is not recommended, the Editor accepts the paper if and only if the estimated paper quality is above his z standard,

(19) $$\alpha F_i Q + (1-\alpha)\,\tilde{r} \geq z.$$

For an author in group i, the Editor consults a referee in group i with probability $\beta_i$, and a referee in the other group with probability $(1-\beta_i)$. For the moment, I assume that the $\beta_i$ are fixed, with $\beta_i > ½$ for $i \in \{0,1\}$, so that authors in each group can expect to obtain a referee from their own group more often than one from the other group.

Given this structure, a paper is accepted if, with a referee from group j of type $t \in \{T \text{ (tough)}, K \text{ (kind)}\}$

(20) $$\varepsilon \geq W_{ijt} - r, \text{ where}$$

(21) $$W_{ijt} = \max \{ w_j + \tilde{v}, [z - \alpha F_i Q]/(1-\alpha)\}$$

Averaging across potential referee groups j and types t gives the average author standards:

(22) $$W_0 = \beta_0 \{\eta_0 W_{00T} + (1-\eta_0)W_{00K}\} + (1-\beta_0)\{\eta_1 W_{01T} + (1-\eta_1)W_{01K}\}$$

(23) $$W_1 = \beta_1 \{\eta_1 W_{11T} + (1-\eta_1)W_{11K}\} + (1-\beta_1)\{\eta_0 W_{10T} + (1-\eta_0)W_{10K}\}$$

An author's probability of acceptance is determined by his/her average standard, $P_H(r,W_i) = g(\underline{\varepsilon} + r - W_i)$. Referees have a rational inference of a journal's standard, based on their group's experience,

(24) $$w_j = W_j$$

To characterize an equilibrium, recall the definition of $F_i$ (the Editor's expected "high impact" from a group i author)

(25) $$F(W) = f(q(a,W),H)$$

with a = common author ability, and the Editor's hurdle,

(26) $$V(W) = [z - \alpha F(W)Q]/(1-\alpha).$$

Substituting (24)-(26) into (22)-(23) gives equilibrium values of $(W_0,W_1)$:

(22') $$W_0 = \beta_0 \{\eta_0 \max (W_0+v_+,V(W_0)) + (1-\eta_0) \max (W_0-v_-,V(W_0)) \}$$
$$+ (1-\beta_0) \{\eta_1 \max (W_1+v_+,V(W_0)) + (1-\eta_1) \max (W_1-v_-,V(W_0))\}$$

(23') $$W_1 = \beta_1 \{\eta_1 \max (W_1+v_+,V(W_1)) + (1-\eta_1) \max (W_1-v_-,V(W_1)) \}$$
$$+ (1-\beta_1) \{\eta_0 \max (W_0+v_+,V(W_1)) + (1-\eta_0) \max (W_0-v_-,V(W_1))\}$$

Proposition 3. In Model 2, there is equilibrium editorial favoritism – with group 1 favored over group 0, $W_0>W_1$ – provided (i) $\beta_0+\beta_1 > 1$, and (ii) $\eta_0 > \eta_1$.

The intuition is straightforward. Group 0 has relatively more tough referees ($\eta_0 > \eta_1$). Group 0 is also relatively more exposed to referees from group 0 than is group 1 (with $\beta_0+\beta_1 > 1$). As a result, group 0 is more exposed to the higher editorial hurdle imposed by the tough reviewers. Note that the resulting discrimination is subject to two multipliers: First, the higher hurdle of the tough referees ($v_+>0$) raises the average hurdle ($W_0$), which further raises the hurdle of group 0 referees ($W_0+v_+$), and so on. Second, the higher average hurdle ($W_0$) reduces group 0's incentives to produce q-quality, thus raising the Editor's $V(W_0)$ hurdle, which in turn raises the average hurdle $W_0$, and so on.

Several other results can also be obtained. To do so, I assume (for simplicity):

Assumption 2. $v_-$ is sufficiently large that (in an equilibrium (22')-(23')),

$$W_i-v_- < V(W_i).$$

Proposition 4. Lowering the proportion of papers handled by referees from the same group ($\beta_i$) reduces the extent of editorial favoritism (assuming $\beta_0+\beta_1 > 1$):

$$d(W_0-W_1)/d\beta_i > 0.$$

Lowering $\beta_0$ exposes group 0 to a lower fraction of tough referees, while lowering $\beta_1$ exposes group 1 to a higher faction of the tough referees. Both changes thereby reduce the difference between the groups in their exposure to the tough reviewers, which in turn reduces the difference between the two groups' equilibrium editorial hurdles.

Proposition 5. (A) if $c_q$ is constant, then: Editorial favoritism leads to a lower average number of high impact papers. That is, setting $\beta_0=\beta_1=$ ½ ( vs. $\beta_0+\beta_1 > 1$) will lead to a higher number of high impact papers. (B) However, suppose $c_{rq}$ is constant, and for relevant $(q,P_H)$, (i) $0\leq c_{rq} \leq gU_qf_q$; (ii) $P_HU_qf_{qq}+2c_{qq} > 0$; and (iii) $f_{qqq} \approx c_{qqq} \approx 0$. Then editorial favoritism leads to a higher number of high impact papers.

Consider the case of slight favoritism, when the favored group 1 enjoys a slightly higher probability of publication in the H journal. What happens to the average number of high impact papers ("average q") when favoritism is increased? There are two offsetting effects. First is a "portfolio effect"; due to the initial favoritism, group 1 produces higher q, implying that average q-quality rises when allocating more journal space to the favored group. Second is an offsetting "incentive effect." Due to diminishing returns to q production ($f_{qq}<0$), the marginal benefit of "editorial favor" ($P_H$) in stimulating higher expected q is smaller for the high-q / favored group 1 than for the lower-q / unfavored group 0. Hence, allocating more journal space to group 1 has a negative incentive effect on the number of high impact papers. Either effect can dominate, as described in Proposition 5.

Finally, for the same reasons as in Model 1, we have:

Proposition 6. Suppose

$$\frac{d}{dW}\left[\frac{dq(a,W)}{dW}\right] \le 0$$

Then: Tighter publication standards (z) lead to a greater extent of editorial favoritism,

$$d[W_0-W_1]/dz > 0.$$

VI. Endogenous Reviewer Assignments ($\beta_0,\beta_1$)

I have so far assumed that the Editor's policy of assigning reviewers – the fraction of the time that an author is assigned a referee from his/her own group – is fixed. Now let us allow the Editor to choose these fractions optimally.

Let $\chi$ denote the maximum number of papers that can be assigned to any one referee (per period, on average). I will assume that this number is no lower than one, but is also bounded above:

Assumption 3. $1 \le \chi < 1+(N_0/N_1)$.

For example, if the "out-of-network" group 0 is larger ($N_0>N_1$) and each referee can be assigned no more than two reviews per period ($\chi=2$), then Assumption 3 will hold. The second inequality implies that no one group can referee all submitted papers.

In choosing the fractions, ($\beta_0,\beta_1$), the Editor is subject to two types of constraints. First, $\chi$ places an upper bound on the number of papers that can be sent to each group of reviewers:

(A) Number of papers refereed by group 0 = $N_0\beta_0+N_1(1-\beta_1)$

$\le \chi N_0$ = maximum number of group 0 reviews

(B) Number of papers refereed by group 1 = $N_1\beta_1+N_0(1-\beta_0)$

$\le \chi N_1$ = maximum number of group 1 reviews

Constraints (A) and (B) place upper and lower bounds (respectively) on $\beta_0$:

(27) $\beta_0 \leq \chi + (N_1/N_0)(\beta_1-1)$ and $\beta_0 \geq 1 + (N_1/N_0)(\beta_1-\chi)$

Second, of course, both fractions must lie in the unit interval,

(C) $0 \leq \beta_0 \leq 1$, and $0 \leq \beta_1 \leq 1$.

Figure 1 graphs the constraints. Two observations are relevant to the graph. When $\beta_1$=1, Assumption 3 implies that the lower bound for $\beta_0$ (from constraint (B)) is positive and no greater than one. Moreover, when $\chi$ is greater than one, the upper bound for $\beta_0$ (from constraint (A)) is above the lower bound (from constraint (B)); when $\chi$ equals one, the two constraint lines are identical and reduce to one equality restriction.

Subject to these constraints and a binding quota on the average number of papers that can be published (the Journal space constraint), the Editor's objective is to maximize the average (weighted) quality of published papers. The space constraint yields the shadow value (publication standard) z. I will assume that the Editor takes as given the equilibrium values, $(W_0, W_1)$, and the referee attributes, $(\eta_0,\eta_1)$. Because there are multiple Editors, and any one Editor has a relatively short editorial tenure, an individual Editor cannot affect these equilibrium outcomes.

Without loss, I also assume that group 0 is the disadvantaged group, $W_0 \geq W_1$ with $\eta_0 \geq \eta_1$ (where the two inequalities will be related in a moment). The Editor's choice problem is then as follows:

(28) $\max_{(\beta_0,\beta_1)} J^{**} = N_0 J^{0*} + N_1 J^{1*}$ s.t $(\beta_0,\beta_1) \in B$

where, with

$$J_i(X) = g \int_{X-r_i}^{\bar{\varepsilon}} \{(1-\alpha)(r_i+\varepsilon) + \alpha Q f(q_i;H) - z\}\, d\varepsilon = g \int_{X-r_i}^{\bar{\varepsilon}} (1-\alpha)(r_i+\varepsilon - V(W_i))\, d\varepsilon$$

= average net quality of author i paper accepted for publication when $\varepsilon > X - r_i$

$J^{0*}$ = average accepted paper quality from group 0 author (net of z)

$$= \beta_0\eta_0\, J_0(W_0+v_+) + [\beta_0(1-\eta_0)+(1-\beta_0)(1-\eta_1)]\, J_0(V(W_0)) + (1-\beta_0)\eta_1\, J_0(\max(W_1+v_+,V(W_0))),$$

$J^{1*}$ = average accepted paper quality from group 1 author (net of z)

$$= \beta_1\eta_1\, J_1(W_1+v_+) + \beta_1(1-\eta_1)\, J_1(V(W_1)) + (1-\beta_1)\eta_0\, J_1(W_0+v_+) + (1-\beta_1)(1-\eta_0) J_1(\max(W_0-v_-,V(W_1))),$$

The following inequalities are easily established, and imply the optimum depicted in Figure 1: (a) $dJ^{**}/d\,\beta_0 = N_0\, dJ^{0*}/d\,\beta_0 < 0$ (=0 if $W_0-W_1=\eta_0-\eta_1=0$); (b) $dJ^{**}/d\,\beta_1 = N_1\, dJ^{1*}/d\,\beta_1 > 0$ (=0 if $W_0-W_1=\eta_0-\eta_1=0$); and (c) $dJ^{**}(\beta_0(\beta_1), \beta_1)/d\,\beta_1 > 0$, where $\beta_0(\beta_1)$ solves (B) with equality,

$$\beta_0(\beta_1) = 1+(N_1/N_0)(\beta_1-\chi).$$

<u>Proposition 7</u>. $\beta_{1*}=1$, $\beta_{0*} = \beta_0(1) = 1 + (N_1/N_0)(1-\chi) \in (0,1]$. The favored group 1 is treated more favorably in the Editor's optimal allocation of reviewers.

Intuitively, tough reviewers recommend rejection more often than the Editor would himself (herself) reject, given his/her efficient standard. Therefore, ceteris paribus, one would like to minimize authors' exposure to the tough reviewers. Because group 1 has fewer tough referees, this criterion favors a lower $\beta_0$ and a higher $\beta_1$, subjecting authors of both groups to more group 1 referees. Group 1 referees are therefore scarce; that is, constraint (B) binds. Moreover, allocating group 1 reviewers between groups 0 and 1 authors (along constraint (B)), the Editor favors group 1 authors because the extent of over-rejection by group 0 reviewers is greater for group 1 authors who produce higher quality papers, than for group 0 authors. In particular, consider the difference between the inflated standard of the tough group 0 reviewers, $W_0+v_+$, and the Editor's (efficient) standard for a group i author, $V(W_i)$. Because the Editor infers a higher q-quality from group 1, the Editor's hurdle (for r) is lower for group 1, $V(W_1)<V(W_0)$. Hence, for group 1 (vs. group 0) authors, there is a higher cost of excessive rejection by the tougher group 0 reviewers. The Editor avoids this higher cost of excessive rejection by allocating the kinder group 1 referees first to group 1 itself. Note that if $\chi$ equals one (so that each author can only referee once per period, on average), then this rule reduces to setting $\beta_0=\beta_1=1$; that is, each group of authors is allocated referees exclusively from their own group.

VII. Endogenous Referee Propensities to be Tough ($\eta_0,\eta_1$)

I have so far assumed that the referee propensities to be tough, ($\eta_0$, $\eta_1$), are exogenous. Let us now suppose that the author groups are *completely identical apriori* (save perhaps their constituent numbers), and allow these propensities to be equilibrium outcomes. The key question for this analysis is: Can an asymmetric equilibrium arise in which one group is "tougher" than the other, and is treated less favorably in the editorial process ($W_0>W_1$)?

Let us assume that the propensity to be tough is related to the relative rejection rate experienced by authors in the different groups:

(29) $$\eta_i = \eta(x_{ij}) = \begin{cases} \eta^+ & \text{if } x_{ij}<1 \\ \eta^- & \text{if } x_{ij}\geq 1 \end{cases}$$

where $1>\eta^+>\eta^->0$ and $x_{ij} = P_{Hi}/P_{Hj}$ = relative acceptance probability for group $i\neq j$. Equation (29) indicates that, if an author (rationally) perceives an editorial disadvantage relative to the overall population of authors, he/she is more likely to be tough (with $\eta^+>$

$\eta^-$). Of course, one might envision more continuity in the propensity function; while the logic of what follows extends to such environments, I choose the most parsimonious specification for simplicity.

Again without loss, I index the groups so that group 0 is weakly disadvantaged ($W_0 \geq W_1$, and $\eta_0 \geq \eta_1$), implying (from Section VI above) an Editor choice of $\beta_1=1$ and $\beta_0 = 1+(N_1/N_0)(1-\chi) \in (0,1]$.[15] An equilibrium value for $W_1$ thus solves:

(30) $$W_1 = \eta_1 (W_1+v_+) + (1-\eta_1) V(W_1), \ \ \eta_1 = \eta^-.$$

<u>Lemma 5</u>. Equation (30) has a unique stable solution,

$$W_1=W^*=V(W^*)+(\eta^-/(1-\eta^-))v_+.$$

Clearly, $W_0= W_1=W^*$ defines a symmetric equilibrium. The interesting case for this paper is an asymmetric equilibrium in which $W_1=W^*$, $\eta_1 = \eta^-$, and $W_0>W_1$ solves:

(31) $$W_0= \beta_0\eta^+ (W_0+v_+) + \theta V(W_0) + (1-\beta_0)\eta^- \max(W^*+v_+,V(W_0))) \equiv h(W_0),$$

where $\theta=\beta_0(1-\eta^+)+(1-\beta_0)(1-\eta^-)$, and $\beta_0=\beta_0(1)$. It is easily seen that (31) has a unique solution, $W_0> W_1=W^*$ (see Figure 2).[16] Because $W_0> W_1=W^*$, we have $x_{01}<1$ and, hence, $\eta_0=\eta^+>\eta^-=\eta_1$.

<u>Proposition 8</u>. An asymmetric equilibrium can prevail in which there is editorial favoritism, $W_0>W_1$.

Underpinning Proposition 8 is the following logic. Group 0 authors can have pessimistic beliefs about their editorial treatment ($W_0$) that are consistent in the sense that they produce a propensity for tough reviewing in group 0 – and attendant steering of group 0 papers to the tougher group 0 referees, by optimizing Editors – that in turn yield

[15] For $W_0=W_1$, the Editor is indifferent with respect to choices of $(\beta_0, \beta_1)$; hence, $(\beta_0, \beta_1)$ can be set according to Proposition 7 without loss.

[16] Because $\eta^+ > \eta^-$, $h(W^*)>W^*$; hence, with $h'(W_0)<1$ (by Assumption 1), there is a $W_{0*}>W^*$ such that $W_{0*}=h(W_{0*})$ as depicted in Figure 2.

the expected editorial treatment ($W_0$) in equilibrium. For the same reasons, group 1 can have optimistic beliefs ($W_1$) that are "consistent."[17]

VIII. Endogenous Editorial Decision-Making

So far I have assumed that the Editor accepts negative referee recommendations and evaluates positive referee recommendations. That is, a paper recommended for rejection is simply rejected, whereas a paper not recommended for rejection is evaluated by the Editor and accepted if (and only if) the assessed quality is above the Editor's requisite benchmark (z). However, the Editor can, in principle, decide if and when to "evaluate" a paper, based upon the information he/she has about the author's group, the referee's group, and the recommendation of the referee.

To allow for this editorial choice, let e denote the Editor's cost of "evaluating" one paper, rather than simply accepting the referee's negative or positive recommendation. Without evaluation, the Editor will reject a paper recommended for rejection and accept the paper if it is recommended for acceptance. In making his/her evaluation decision, the Editor compares (i) the expected net gains from evaluation in increasing the expected quality of accepted papers, to (ii) the cost of evaluation e.

Consider first the case of ***negative*** referee recommendations. Here there are gains from evaluation whenever the paper would otherwise be *over-rejected* – that is, when the referee rejects, even though the Editor would not. Formally, the gain from evaluation is:

$$\text{gain} = \max(0, \alpha F_i Q + (1-\alpha)\tilde{r} - z) = \max(0, (1-\alpha)(r_i + \varepsilon - V(W_i)))$$

To evaluate the *expected* gain, the Editor can use the information about ε that is provided by the negative referee recommendation, namely the condition,

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[17] See Coate and Loury (1993) for a labor market model of employment discrimination in which there can be an asymmetric equilibrium despite no explicit differences between groups.

(N) $\varepsilon < W_j + \tilde{v} - r_i$

where

$$\text{Probability of (N)} = \begin{cases} G(W_j+v_+-r_i) \text{ for } t=T \\ G(W_j-v_--r_i) \text{ for } t=K \end{cases}$$

The conditional expected gain from evaluation, when the author is from group i and the referee from group j, is thus:

$$\text{(32)} \quad I_{nij} = (1\text{-}\alpha) \{ \eta_j \int_{V(W_i)-r_i}^{\max(W_j+v_+-r_i, V(W_i)-r_i)} (\varepsilon\text{-}V(W_i)+r_i)(g/ G(W_j+v_+-r_i))\, d\varepsilon$$

$$+(1\text{-}\eta_j) \int_{V(W_i)-r_i}^{\max(W_j-v_--r_i, V(W_i)-r_i)} (\varepsilon\text{-}V(W_i)+r_i)(g/ G(W_j-v_--r_i))\, d\varepsilon \}$$

Proposition 9. $I_{n10} > \max (I_{n00}, I_{n11}) > I_{n01}$. Incentives to reevaluate *negative* referee recommendations are (i) highest when the author is from the advantaged group 1 and the referee is from the disadvantaged group 0, and (ii) lowest when the author is from group 0 and the referee from group 1.[18]

The problem of over-rejection is greater when (i) the referee sets an editorial hurdle ($W_j$) that is too high for the author ($W_j>W_i\geq V(W_i)$), as is true when there is an "out-of-network" referee for an in-network author, and (ii) the referee is more likely to be tough (with higher group η). Hence, the problem is greatest when the referee is from the "tougher" group 0 and the author is from the "kinder" group 1. Conversely, the problem is at a minimum when the referee is from group 1 and the author from group 0.

[18] In deriving Propositions 9-10, I assume that r and q are not such strong substitutes that the net Editor hurdle, V(W)-r(W), falls with the gross hurdle W. Sufficient for this is: $c_{rq}<f_q (gUq+(\alpha Q/(1-\alpha))c_{rr})$; for example, if $f_q(q^+)Q \geq (1-\alpha)/\alpha$ (so that the Editor weights marginal q investments at least as much as marginal r investments) and $c_{rr}\geq c_{rq}$ (for convexity of c), then this condition will hold.

Consider next the case of <u>*positive*</u> referee recommendations. Here there are gains from evaluation whenever the paper would otherwise be *over-accepted* – that is, when the referee accepts, even though the Editor would not – implying the following gain:

$$\text{gain} = \max(0, z - \alpha F_i Q - (1-\alpha)\tilde{r}) = \max(0, (1-\alpha)(V(W_i) - r_i - \varepsilon))$$

To evaluate the *expected* gain, the Editor can again use the information about ε that is provided by the referee recommendation, namely the condition,

$$\text{(P)} \qquad \varepsilon \geq W_j + \tilde{v} - r_i$$

where

$$\text{Probability of (P)} = \begin{cases} 1 - G(W_j+v_+-r_i) & \text{for } t=T \\ 1 - G(W_j-v_--r_i) & \text{for } t=K \end{cases}$$

The conditional expected gain from evaluation is thus:

$$\text{(33)} \quad I_{pij} = (1-\alpha)\left\{ \eta_j \int_{\min(W_j+v_+-r_i,\,V(W_i)-r_i)}^{V(W_i)-r_i} (V(W_i) - r_i - \varepsilon)[g/(1-G(W_j+v_+-r_i))]\, d\varepsilon \right.$$

$$\left. + (1-\eta_j) \int_{\min(W_j-v_--r_i,\,V(W_i)-r_i)}^{V(W_i)-r_i} (V(W_i) - r_i - \varepsilon)[g/(1-G(W_j-v_--r_i))]\, d\varepsilon \right\}$$

<u>Proposition 10</u>. $I_{p01} > \max(I_{p00}, I_{p11}) > I_{p10}$. Incentives to reevaluate *positive* referee recommendations are (i) highest when the author is from the disadvantaged group 0 and the referee is from the advantaged group 1, and (ii) lowest when the author is from group 1 and the referee from group 0.

The problem of over-acceptance is greater, the greater the extent to which the referee is kind, and the lower the editorial hurdle of the kind referee. For example, a kind referee from the "kinder" group 1 (vs. the tougher group 0) sets a lower editorial hurdle ($W_1<W_0$), implying a greater extent of over-acceptance for group 0 authors. Because

group 1 also has more kind referees, the problem of over-acceptance is greatest with the group 1 referees and group 0 authors. Conversely, the problem is least when the referee is from the tougher group 0 and the author is from the advantaged group 1.

Together, Propositions 9 and 10 suggest another margin on which optimizing Editors may advantage the "in-network" group 1.

Finally, let us tie the Editor's evaluation decision in with our prior analysis. To do so, note the following:

Lemma 6. Consider the equilibrium defined by equations (30)-(31), $\{W_1=W^*, \eta_1 = \eta^-, W_0=W^*_0, \eta_0 = \eta^+\}$, with $\beta_1=1$ and $\beta_0 \varepsilon (0,1]$ (Proposition 7). As the editorial standard (z) tightens (and the equilibrium ($W_0$, $W_1$) rise in tandem), the Editor's incentives to review *negative* referee recommendations ($I_{nii}$) *fall* and incentives to review *positive* recommendations ($I_{pii}$) *rise*.

As standards tighten, more papers are recommended for rejection, lowering the ratio of "bad rejections" (the number of which do not change appreciably) to all rejections (the number of which rises). Hence, the Editor's expected gain from review, in catching a bad rejection, falls. Likewise, fewer papers are recommended for acceptance. This raises the ratio of "bad acceptances" to all acceptances, which elevates the Editor's expected gain from catching a bad acceptance.

Lemma 6 implies that if editorial standards are sufficiently tight, it pays for the Editor only to evaluate positive recommendations of own-group reviewers:

(34) $$\max (I_{p00}, I_{p11}) > e > \max (I_{n00}, I_{n11}).$$

Moreover, combining equation (34) with Propositions 9 and 10 implies that

(35) $$I_{p01} > e > I_{n01}.$$

Hence, with group 1 only subject to group 1 reviewers (Proposition 7), we have the following result:

Proposition 11. If editorial standards are sufficiently tight, then the equilibrium of equations (30)-(31) (and Proposition 7) yields an optimal editorial strategy of evaluating all positive referee recommendations and rejecting all papers recommended for rejection.

The Editor's cost of evaluation (e) can also affect the optimal strategy for allocating referees (Proposition 7). If particularly high, these costs can motivate a preference for the tough reviewers because these reviewers reduce the proportion of papers that the Editor must evaluate. I call this the "lazy Editor" equilibrium because the Editor's interest in reducing his own effort trump his interest in improving journal quality. However, even in this case, our qualitative conclusions persist; there remains an asymmetric equilibrium in which editorial favoritism is exercised (Proposition 8).

Proposition 12. Suppose that the Editor has positive costs of evaluation (e>0) and evaluates only positive referee recommendations. If $W_0 > W_1$ and $\eta_0 > \eta_1$, then the Editor's optimal strategy for allocating referees takes one of three possible forms: (1) $\beta_{1*} = 1$ and $\beta_{0*} = \beta_0(1)$ as before; (2) $\beta_{0*} = \beta_{1*} = 1$; or (3) $\beta_{0*} = 1$ and $\beta_{1*} \, \varepsilon \, [1-(\chi-1)(N_0/N_1),1] > 0$ (the "lazy Editor" equilibrium). In all three cases, there is an asymmetric equilibrium in Editorial hurdles, $W_0 > W_1$ and $\eta_0 = \eta^+ > \eta^- = \eta_1$.

Even the "lazy Editor" allocates more of the disadvantaged group's papers to the tough reviewers of this group. The reason is that, in this case, the group 0 reviewers are scarce; they are too few to handle all papers (Assumption 3). Because the cost of allocating these reviewers to group 0 authors – in compromised journal quality – is smaller than for the advantaged group authors, they are first allocated to group 0 (so that

$\beta_0 = 1$) and then to group 1 (yielding $\beta_1 > 0$). Hence, editorial favoritism persists for the same reasons as before.

IX. Conclusion

In this paper, I develop a model of editorial favoritism with two variants. In the first, the editorial process endogenously discriminates between two groups due to inter-group differences in the distribution of author abilities; that is, statistical discrimination arises in equilibrium. In the second, favoritism is not the result of any differences in ability and, hence, is not a form of statistical discrimination. Rather, favoritism arises due to the tendency of different groups' reviewers to be "tougher" or "kinder." The two models produce some similar predictions, and some sharp contrasts. Both yield equilibrium favoritism with quality-maximizing Editors, and both suggest that the extent of discrimination is likely to rise as editorial standards tighten due to increased competition for space in elite journals. However, "statistical favoritism" may be socially advantageous in the sense that it can lead ultimately to a higher number of path-breaking papers. In contrast, equilibrium favoritism in the second ("non-statistical") model is often disadvantageous, producing fewer path-breaking papers than would arise if referees were allocated so as to eliminate one group's advantage – that is, allocated differently than optimizing Editors would choose.

Both models predict that favorable editorial treatment is correlated with author production of higher paper quality. The second model, in addition, predicts that a symptom of favoritism is an allocation of "advantaged group" papers to "advantaged group" referees. The first observation suggests that extant empirical work on favoritism, documenting a positive link between an author's editorial ties and his/her paper's subsequent citations, does not necessarily refute the favoritism hypothesis. Hence, this paper suggests that a more direct test of favoritism, focusing on the likelihood of publication, would be informative. In addition, the second observation suggests an indirect test of favoritism, by examining the editorial practices of elite journals.

References

Azar, O., "The Review Process in Economics: Is It Too Fast?" Southern Economic Journal 72 (2005): 482-91.

Bardhan, P. "Journal Publication in Economics: A View from the Periphery." Economic Journal 113 (2003): F332-37.

Blank, R., "The Effects of Double-Blind versus Single-Blind Reviewing: Experimental Evidence from The American Economic Review," American Economic Review 81 (1991): 1041-67.

Coate, S., and G. Loury, "Will Affirmative Action Policies Eliminate Negative Stereotypes," American Economic Review 83 (1993): 1220-40.

Ellison, G., "Evolving Standards for Academic Publishing: A q-r Theory," Journal of Political Economy 110 (2002a): 994-1034.

Ellison, G., "The Slowdown of the Economics Publishing Process," Journal of Political Economy 110 (2002b): 947-93.

Gans, J., and G. Shepherd, "How are the Mighty Fallen: Rejected Classic Articles by Leading Economicsts," Journal of Economic Perspectives 8 (1994): 165-79.

Joseph, K., D. Laband, and V. Patil, "Author Order and Research Quality," Southern Economic Journal 71 (2005): 545-55.

Laband, D. and M. Piette, " Favoritism versus Search for Good Papers: Empirical Evidence Regarding the Behavior of Journal Editors," Journal of Political Economy 102 (1994): 194-203.

Laband, D. and R. Tollison, "Intellectual Collaboration," Journal of Political Economy 108 (2000): 632-62.

Laband, D. and R. Tollison, “Dry Holes in Economic Research,” Kyklos 56 (2003): 161-74.

Laband, D., R. Tollison, and G. Karahan, “Quality Control in Economics,” Kyklos 55 (2002): 315-34.

Laband, D. and J. Wells, “The Scholarly Journal Literature of Economics: A Historical Profile of the AER, JPE, and QJE,” American Economist 42 (1998): 47-58.

Medoff, M., “Editorial Favoritism in Economics?” Southern Economic Journal 70 (2003): 425-34.

Milgrom, P. and S. Oster, “Job Discrimination, Market Forces, and the Invisibility Hypothesis,” Quarterly Journal of Economics 102 (1987): 453-76.

Table 1

Acceptance Rates at Top Three American Journals By Institution

| | Percent of Pages | | |
|---|---|---|---|
| | 1970-79 | 1980-89 | 2000-03 |
| AER | | | |
| Top 4 institutions | 13.1 | 17.0 | 19.0 |
| Top 8 institutions | 23.7 | 27.9 | 31.6 |
| JPE | | | |
| Top 4 institutions | 22.8 | 18.6 | 26.4 |
| Top 8 institutions | 32.8 | 31.1 | 39.7 |
| Chicago | 11.2 | 7.0 | 13.9 |
| QJE | | | |
| Top 4 institutions | 23.1 | 19.4 | 43.1 |
| Top 8 institutions | 34.1 | 29.8 | 57.5 |
| Harvard/MIT | 15.6 | 10.9 | 28.1 |

(Source: Siegfried, 1994; Wu, 2004.)

Appendix

*Proof of Lemma 3*. Totally differentiating $(dq/dW) = -(J^*)^{-1}J_{rr}J_{qW}$,

$$\frac{d}{dW}\left[\frac{dq}{dW}\right] = -(J^*)^{-1}\{(dJ^*/dW)(dq/dW)+(d(J_{rr}J_{qW})/dW)\} = A + B,$$

where $J^*= J_{rr}J_{qq} - (J_{rq})^2 > 0$ (by second order conditions),

$$A = \text{second order effects} = D\,E \overset{s}{=} -E = \{ J_{rq}J_{qW} - 2(J^* - J_{rq}J_{qW})\}$$

$$= -2\,(c_{rr}c_{qq}-c_{rq}^{2}) - J_{qW}(J_{qW}-c_{rq}) + 2c_{rr}U_qP_Hf_{qq} < 0,$$

where $D= - c_{rr}U_qgf_{qq}(dq/dW)(J^*)^{-2}<0$ and the inequalities follow from convexity of c, $f_{qq}<0$, $J_{qW}<0$, $dq/dW<0$, and $-J_{qW}+c_{rq}\geq 0$ (note 6);

$$B = \text{third order effects} = - (J_{qW})^2\, J_{qr}(J^*)^{-3}\ \{c_{rrr}(J_{qr})^2 + 3\, c_{rr}(c_{rr}c_{qqr} + J_{qr}c_{rrq})\}$$

$$+ c_{rr}(dq/dW)^2(U_qP_Hf_{qqq} - c_{qqq}) < 0,$$

where the inequality follows from $f_{qqq}\leq 0$, $c_{qqq}\geq 0$ (note 6), and the prior condition of Lemma 3. QED.

*Proof of Lemma 4*. Existence follows from (A) $V()< z/(1-\alpha)$ for all W, (B) $V()> \bar{V}$ for all W, where $\bar{V} < z/(1-\alpha)$ is defined in note 9, and hence, (C) by the Intermediate Value Theorem, there exists an $W \in(\bar{V}, z/(1-\alpha))$: $V()=W$. Uniqueness and stability follow from Assumption 1. QED.

*Proof of Proposition 1*. We have

$$dW^*(z,\gamma)/d\gamma = V_\gamma()/(1-V_W()) \overset{s}{=} V_\gamma() = - (\alpha Q/(1-\alpha))[\, f(q(h,W))-f(q(l,W))] < 0,$$

where the sign equality is due to Assumption 1, and the inequality is due to $f_q>0$ and $q(h,W)>q(l,W)$. Similarly,

$$dW^*(z,\gamma)/dz \overset{s}{=} V_z() = (1-\alpha)^{-1} > 0.$$

Finally,

$$\frac{d}{dz}\left[\frac{dW^*(z,\gamma)}{d\gamma}\right] = \frac{d}{dz}\left(\frac{V_\gamma}{1-V_W}\right) = \frac{dW^*}{dz}\ \frac{d}{dW}\left(\frac{V_\gamma}{1-V_W}\right)$$

$$\overset{s}{=} V_{\gamma W}()(1-V_W()) + V_\gamma()V_{WW}() < 0,$$

where the sign equality is due to part (B), and the inequality follows from $V_\gamma()<0$ (part (A)), $V_W()<1$ (Assumption 1), and

$$V_{\gamma W}() = (\alpha Q/(1-\alpha))[\, f_q(q(h,W))(dq(l,W)/dW)-f_q(q(l,W))(dq(h,W)/dW)] < 0,$$

$$V_{WW}() = -\,(\alpha Q/(1-\alpha)) \sum_{a=l}^{h} \gamma_a(\gamma)[\, f_{qq}(q(a,W))(dq(a,W)/dW)^2$$

$$+ f_q(q(a,W))(d^2q(a,W)/dW^2)] > 0,$$

with $\gamma_h(\gamma) = \gamma$ and $\gamma_l(\gamma) = (1-\gamma)$. The last two inequalities follow from $dq/dW<0$, $f_{qq}<0$, $d^2q/dW^2<0$, and $q(h,W)>q(l,W)$. QED.

*Proof of Proposition 2*. Differentiating (16) with respect to $W_0$, where $W_1=W_1(W_0)$ from (17),

(A1) $$dn_Q/dW_0 \overset{s}{=} Z_0 - Z_1,$$

where (substituting from (11) and rewriting) $Z_i=Z(\gamma_i,W_i)$.

(A2a) $$Z(\gamma,W) = -\, g\, f(q(h,W)) + [A(\gamma,W)/B(\gamma,W)]$$

(A2b) $$A(\gamma, W) =\{ \sum_{a=l}^{h} \gamma_a(\gamma)[P_H(r(a,W),W)f_q(q(a,W))(dq(a,W)/dW)\}$$

$$+ (1-\gamma)g[1-(dr(l,W)/dW)]\{f(q(h,W))-f(q(l,W))\},$$

(A2c) $$B(\gamma, W) =\{ \sum_{a=l}^{h} \gamma_a(\gamma)\, g[1-(dr(a,W)/dW)]\},$$

where $\gamma_h(\gamma) = \gamma$ and $\gamma_l(\gamma) = (1-\gamma)$. I need to show, under the assumed premises, that $Z_0>Z_1$ when $W_0\geq W_1$. The prior premises imply that

$$d^2q/dW^2 = d^2r/dW^2 = d^2q/dadW = d^2r/dadW = 0.$$

Further, given these relationships, we have:

(A3a) $\partial B/\partial\gamma = \partial B/\partial W = 0$

(A3b) $\partial A/\partial\gamma = f_q \{[P_H(r(h,W),W)- P_H(r(l,W),W)](dq(l,W)/dW)\}$

$- g[1-(dr(l,W)/dW)]\{f(q(h,W))-f(q(l,W))\} < 0,$

(A3c) $\partial A/\partial W = - \sum_{a=l}^{h} \gamma_a(\gamma) [1-(dr(a,W)/dW)] f_q (dq/dW) > 0$

(A3d) $df(q(h,W))/dW = f_q (dq/dW) < 0$

Together with $\gamma_0 > \gamma_1$ and $W_0 \geq W_1$, these inequalities imply that $Z_0>Z_1$ and, hence, $dn_Q/dW_0>0$. QED.

*Proof of Proposition 3*. Let $(W_{0*}, W_{1*})$ denote solutions to (22')-(23'), and let $X_i(W_i,W_{j\neq i})$ denote the right-hand-side of (22') (for i=0) and (23') (for i=1). Let $W_+(\theta)$ solve, for $0< \theta<1$:

$$W = \theta(W+v_+) + (1-\theta)V(W) \equiv h(W,\theta)$$

where $\partial W_+/\partial\theta > 0$. Note that (with $V'<1$), if $W>(<)h(W,\theta)$, then $W>(<)W_+(\theta)$. Further, let

$\theta_0 \equiv \beta_0\eta_0 + (1-\beta_0)\eta_1$ = probability of tough reviewer for group 0 author

$\theta_1 \equiv \beta_1\eta_1 + (1-\beta_1)\eta_0$ = probability of tough reviewer for group 1 author

Now suppose (toward a contradiction) that $W_{0*} \leq W_{1*}$. Then

(A4a) $W_{0*} = X_0(W_{0*}, W_{1*}) \geq h(W_{0*},\theta_0) \rightarrow W_{0*} \geq W_+(\theta_0)$

(A4b) $W_{1*} = X_1(W_{1*}, W_{0*}) \leq h(W_{1*},\theta_1) \rightarrow W_{1*} \leq W_+(\theta_1)$

where the first inequalities follow from $W_{0*} \leq W_{1*}$. With

$$\theta_0 - \theta_1 = (\eta_0 - \eta_1) (\beta_0+\beta_1 - 1) > 0,$$

and $\partial W_+/\partial\theta > 0$, (A4) implies the contradiction, $W_{0*} \geq W_+(\theta_0) > W_+(\theta_1) \geq W_{1*}$. QED.

*Proof of Proposition 4*. By assumption, $W_{i^*}$-$v_-$<$V(W_{i^*})$. Moreover, by the definition of the equilibrium in (22')-(23'), we have $W_{i^*} \geq V(W_{i^*})$, implying that $W_{i^*}+v_+>V(W_{i^*})$. There are therefore four possible cases (given $W_{0^*}>W_{1^*}$ by Proposition 3),

(a) $W_{1^*} + v_+ \leq V(W_{0^*}) \quad \leftrightarrow \quad \delta_0 = 1\ (0)$

(b) $W_{0^*} - v_- \leq V(W_{1^*}) \quad \leftrightarrow \quad \delta_1 = 1\ (0)$

The equilibrium in (22')-(23') can therefore be written as follows:

(A5a) $$W_0 = \beta_0\eta_0 (W_0+v_+) + [\beta_0 (1-\eta_0) + (1-\beta_0)(1-\eta_1)]\, V(W_0) + (1-\beta_0)\eta_1 [\delta_0 V(W_0) + (1-\delta_0)(W_1+v_+)] = X_0()$$

(A5b) $$W_1 = \beta_1\eta_1(W_1+v_+) + \beta_1 (1-\eta_1)V(W_1) + (1-\beta_1)\eta_0(W_0+v_+) + (1-\beta_1)(1-\eta_0)[\delta_1 V(W_1) + (1-\delta_1)(W_0-v_-)] = X_1()$$

Define:

$$A = 1-(\partial X_0/\partial W_0) = (1-\beta_0\eta_0) - [\beta_0 (1-\eta_0) + (1-\beta_0)(1-\eta_1(1-\delta_0))]\, V'(W_0) \geq (1-\beta_0\eta_0)(1-V'(W_0)) > 0,$$

$$B = - \partial X_0/\partial W_1 = - (1-\beta_0)\eta_1(1-\delta_0) \leq 0,$$

$$C = - \partial X_1/\partial W_0 = - (1-\beta_1) [\eta_0 + (1-\eta_0)(1-\delta_1)] < 0,$$

$$D = 1-(\partial X_1/\partial W_1) = (1-\beta_1\eta_1) - [\beta_1 (1-\eta_1) + (1-\beta_1)(1-\eta_0)\delta_1]\, V'(W_1) \geq (1-\beta_1\eta_1) (1-V'(W_1)) + (1-\beta_1)\eta_0 V'(W_1) > 0,$$

$$E = (\partial X_0/\partial \beta_0) = \eta_0 (W_0+v_+ - V(W_0)) + \eta_1 V(W_0) - \eta_1 [\delta_0 V(W_0) + (1-\delta_0)(W_1+v_+)] > (\eta_0 - \eta_1)(W_0+v_+ - V(W_0)) > 0,$$

using $W_0+v_+ > [\delta_0 V(W_0) + (1-\delta_0)(W_1+v_+)]$, and

$$F = (\partial X_1/\partial \beta_1) = \eta_1 (W_1+v_+ - V(W_1)) + V(W_1) - \eta_0 (W_0+v_+) - (1-\eta_0)[\delta_1 V(W_1) + (1-\delta_1)(W_0-v_-)] \leq \eta_1 (W_1+v_+ - V(W_1)) - \eta_0 (W_0+v_+ - V(W_1))$$

$< (\eta_1 - \eta_0)(W_0+v_+ - V(W_1)) < 0,$

using $V(W_1) \leq [\delta_1 V(W_1) + (1-\delta_1)(W_0-v_-)]$, $W_0>W_1$, and $\eta_0 > \eta_1$. Now note that $(\partial X_0/\partial \beta_1) = (\partial X_1/\partial \beta_0) = 0$, and

$$A+B = [1-\beta_0\eta_0 - (1-\beta_0)\eta_1(1-\delta_0)]\,(1-V'(W_0)) > 0,$$

$$C+D = [\beta_1\,(1-\eta_1) + (1-\beta_1)(1-\eta_0)\delta_1]\,(1-V'(W_1)) > 0.$$

Hence, AB-CD> 0 and, differentiating (A5)

(A6a) $$d(W_0-W_1)/d\beta_0 \overset{s}{=} E(C+D) > 0,$$

(A6a) $$d(W_0-W_1)/d\beta_1 \overset{s}{=} -F(A+B) > 0.$$

(A6) implies Proposition 4. QED.

*Proof of Proposition 5*. First note that there is a monotonic (negative) relationship between W and $P_H$, the probability of publication in H. It therefore suffices to consider the allocation of P ($=P_H$) between the two groups, subject to the journal capacity:

(A7) $$\sum_{i=0}^{1} N_iP_i = K$$

For given P, author choices of r and q solve

(A8) r: $g\,(U_H+f(q)U_q - P_LU_L) - c_r(r,q) = 0 \quad \rightarrow \quad r(q)$

(A9) q: $U_q\,P\,f_q(q) - c_q(r(q),q) = 0 \quad \rightarrow \quad q(P)$

The average number of high impact papers is:

(A10) $$n_Q = \sum_{i=0}^{1} N_iP_if(q(P_i)).$$

Differentiating (A10), with $P_1=P_1(P_0)$ solving (A7), gives

(A11) $$dn_Q/dP_0 \overset{s}{=} Z(P_0) - Z(P_1),$$

where $Z(P) = f(q)+Pf_q(q)(dq/dP)$. With $dn_Q/dP_0 = 0$ when $P_0 = P_1$, favoritism reduces (increases) $n_Q$ if $dZ/dP <(>) 0$, so that when $P_0 < P_1$, $dn_Q/dP_0 >(<) 0$. Differentiating Z:

(A12) $$dZ/dP = 2f_q (dq/dP) + P (f_{qq}(dq/dP)^2 + f_q (d^2q/dP^2)),$$

where

(A13a) $$dq/dP = -U_qf_q/\{U_qPf_{qq}-c_{qq}-c_{qr}(dr/dq)\} > 0$$

(A13b) $$dr/dq = (gU_qf_q-c_{rq})/c_{rr} > 0,$$

(A13c) $$d^2r/dq^2 = gU_qf_{qq}/c_{rr} < 0,$$

(A13d) $$d^2q/dP^2 = (f_q)^{-1} 2 f_{qq} (dq/dP)^2 + (U_qf_q)^{-1} (dq/dP)^2 Y.$$

where $Y = [U_qPf_{qqq}-c_{qqq}-c_{qr}(d^2r/dq^2)](dq/dP)$, the last two derivatives are implied by a constant $c_{rq}$, and the inequalities follow from the premises in (A)-(B), $f_{qq}<0$, $c_{qr}\geq 0$, and $c_{qq}>0$. Substituting (A13) into (A12):

(A14) $$dZ/dP = (dq/dP) \{X + P(U_q)^{-1}(dq/dP)Y\},$$

where $X = 2f_q + 3Pf_{qq}(dq/dP) \overset{s}{=} [PU_qf_{qq} + 2c_{qq} + 2\, c_{rq} (dr/dq)]$. With constant $c_q$, $f_{qq}<0$, and $f_{qqq}\leq 0$, we have $Y\leq 0$ and $X<0$, implying that $dZ/dP<0$ (part (A)). Under the premises of part (B), $X>0$ and $Y\geq 0$, implying that $dZ/dP>0$ (part (B)). QED.

*Proof of Proposition 6*. Define

$$G = (\partial X_0/\partial z) = (1-\alpha)^{-1} \{\beta_0 (1-\eta_0) + (1-\beta_0)[(1-\eta_1)+\eta_1\delta_0]\}$$

$$H = (\partial X_1/\partial z) = (1-\alpha)^{-1} \{\beta_1 (1-\eta_1) + (1-\beta_1)(1-\eta_0)\delta_1]\}$$

Differentiating (A5) (and recalling that AB-CD>0 from Proposition 4),

$$d(W_0-W_1)/dz \overset{s}{=} G(C+D) - H(A+B = Y()$$

Note that

$$\partial Y/\partial\delta_0 \overset{s}{=} \partial Y/\partial\delta_0 \overset{s}{=} V'(W_0) - V'(W_1) > 0,$$

where the inequality is due to $W_0 > W_1$ (Proposition 3) and $V_{WW}>0$ (by our premise that $d^2q/dW^2<0$). Hence,

$$Y \geq (1-\alpha)^{-1} \beta_1 (1-\eta_1) [1-\beta_0\eta_0 - (1-\beta_0)\eta_1] (V'(W_0)-V'(W_1)) > 0.$$

where the right hand side evaluates Y at $\delta_0 = \delta_1 = 0$, and the inequality implies the Proposition. QED.

*Proof of Propositions 9 and 10*. With $V(W_i)-r(W_i)$ rising with $W_i$ (note 18), $I_{nij}$ falls and $I_{pij}$ rises with $W_i$; hence, with $W_1<W_0$, $I_{n10} > I_{n00}$, $I_{n01} < I_{n11}$, $I_{p10} < I_{p00}$, and $I_{p01} > I_{p11}$. Similarly, $I_{nij}$ rises (and $I_{pij}$ falls) with $W_j$ and $\eta_j$; hence, with $W_1<W_0$ and $\eta_1<\eta_0$, $I_{n10} > I_{n11}$, $I_{n01} < I_{n00}$, $I_{p10} < I_{p11}$, and $I_{p01} > I_{p00}$. QED.

*Proof of Lemma 6*. When max $(W_1+v_+, V(W_0)) =V(W_0)$ (Case 1), (30)-(31) define the asymmetric equilibrium $(W_0,W_1)$ as follows:

(30') $$W_i = \eta_i (W_i+v_+) + (1-\eta_i) V(W_i),$$

where $\eta_1 = \eta^-$ and $\eta_0 = \beta_0\eta^+$. When max $(W_1+v_+, V(W_0)) =(W_1+v_+)$ (Case 2), the equilibrium simultaneously solves (30') and

(31') $$W_0= \beta_0\eta^+ (W_0+v_+) + \theta V(W_0) + (1-\beta_0)\eta^- (W_1+v_+).$$

Differentiating $I_{nii}$ and $I_{pii}$ from (32)-(33):

(A15) $$dI_{nii}/dz = - \eta_i [\{(\partial V(W_i)/ \partial z)-(dW_i/dz)(1-V'(W_i))\}\{W_i+v_+-V(W_i)\}(g/G_+) + (dW_i/dz)\, g \int_{V(W_i)-r_i}^{W_i+v_+-r_i} \{\varepsilon-V(W_i)+r_i\} g/(G_+^2)\, d\varepsilon ]$$

(A16) $$dI_{pii}/dz = (1- \eta_i) [\{(\partial V(W_i)/ \partial z)-(dW_i/dz)(1-V'(W_i))\}\{V(W_i)-(W_i-v_-)\}(g/(1-G_-)) + (dW_i/dz)\, g \int_{W_i-v_--r_i}^{V(W_i)-r_i} \{V(W_i)-r_i - \varepsilon\} g/(1-G_-)^2\, d\varepsilon ]$$

where $G_+=G(W_i+v_+-r_i)$ and $G_+=G(W_i-v_--r_i)$. From (30'), we have (using Assumption 1 and $\partial V(W_i)/ \partial z = (1-\alpha)^{-1}>0$), (A17) $dW_i/dz = (1-V'(W_i))^{-1}(\partial V(W_i)/\partial z) > 0.$

Substituting (A17) into (A15)-(A16), and recalling that

(A18) $W_i+v_+ > V(W_i) > W_i-v_-$

from the construction of (30'), we have $dI_{nii}/dz < 0$ and $dI_{pii}/dz > 0$ for i=0,1 in Case 1 and for i=1 in Case 2. For i=0 in Case 2, differentiate (31'), using (A17) for $dW_1/dz$ and noting that $(\partial V(W_i)/\partial z)$ is a constant:

(A19) $$(dW_0/dz)(1-V'(W_0)) = V_z\,[(1-\beta_0\eta^+)+\{\eta^-(1-\beta_0)V'(W_0)/(1-V'(W_0)\}]^{-1}$$
$$[(1-\beta_0\eta^+)+\{\eta^-(1-\beta_0)V'(W_1)/(1-V'(W_1)\}] < V_z,$$

where the inequality is due to $0<V'(W_i)<1$ (by Assumption 1 and Lemma 2) and $V''(W_i)>0$. Substituting (A19) into (A15)-(A16), we again have $dI_{n00}/dz < 0$ and $dI_{p00}/dz > 0$. QED.

*Proof of Proposition 12*. (A) Referee Allocation. Define $C^i(\beta_i)$ as the Editor's expected cost of evaluation for an author i paper:

$$C^i(\beta_i) = \beta_i\,[\,\eta_i\,(1-G(W_i+v_+)) + (1-\eta_i)\;1-G(W_i-v_-))]$$
$$+ (1-\beta_i)\,[\,\eta_j\,(1-G(W_j+v_+)) + (1-\eta_j)\;1-G(W_j-v_-))]$$

for $j \neq i$. The Editor's net benefit from an author i paper is thus: $J^{i*}(\beta_i)-C^i(\beta_i)$, where $J^{i*}$ is defined in Section VI. Now note the following: (i) $dC^0(\beta_0)/d\beta_0 = -\,dC^1(\beta_1)/d\beta_1 < 0$; (ii) $dJ^{0*}/d\beta_0<0$; (iii) $dJ^{1*}/d\beta_1>0$; (iv) $(dJ^{0*}/d\beta_0)+(dJ^{1*}/d\beta_1) > 0$; and (v) for $\beta_0(\beta_1)$ that satisfies either constraint (A) or constraint (B),

$$d[J^{**}(\beta_0(\beta_1), \beta_1)-(N_0C^0(\beta_0(\beta_1)) + N_1C^1(\beta_1)]/d\beta_1$$

$$\overset{s}{=} [(dJ^{0*}/d\beta_0)+(dJ^{1*}/d\beta_1)] - [(dC^0/d\beta_0)+(dC^1/d\beta_1)] > 0.$$

There are three cases: (1) $(dJ^{0*}/d\beta_0)-(dC^0/d\beta_0)\leq 0$; (2) $(dJ^{0*}/d\beta_0)-(dC^0/d\beta_0)>0$ and $(dJ^{1*}/d\beta_1)-(dC^1/d\beta_1)>0$; and (3) $(dJ^{0*}/d\beta_0)-(dC^0/d\beta_0)>0$ and $(dJ^{1*}/d\beta_1)-(dC^1/d\beta_1)\leq 0$.

Case (1) implies that $(dJ^{1*}/d\beta_1)$-$( dC^1/d\beta_1)>0$ by observations (i) and (iv) above. Hence, with (v), the unique Editor optimum is as described in Proposition 7 (see Figure 1). In Case (2) (again with (v)), the unique Editor optimum sets $\beta_0= \beta_1=1$. Finally, in Case (3), an optimum is obtained at the intersection of Constraint (A) and $\beta_0=1$, where $\beta_1= 1-\chi(N_0/N_1)\varepsilon(0,1]$.

(B) Asymmetric Equilibrium. For Cases (1) and (2), Proposition 8 applies. For Case (3), let $W_{0*}$ solve

$$W_{0*} = V(W_{0*}) + (\eta^+/(1- \eta^+))v_+,$$

and define the following $W_1$:

(A20) $$W_1 = \beta_1\{ \eta^-(W_1+v_+)+(1- \eta^-)V(W_1)\} + (1-\beta)\{ \eta^+(W_{0*}+v_+)+(1- \eta^+)\max(W_{0*}-v_-,V(W_1))\} =h_1(W_1).$$

Now note:

$$h_1(W_{0*}) = W_{0*} + \beta_1(\eta^- - \eta^+)\{ W_{0*}+v_+-V(W_{0*})\} < W_{0*}.$$

Hence, by Assumption 1 ($h_1'(W_1)<1$), there is a unique $W_{1*}< W_{0*}$ that solves (A20).

QED.

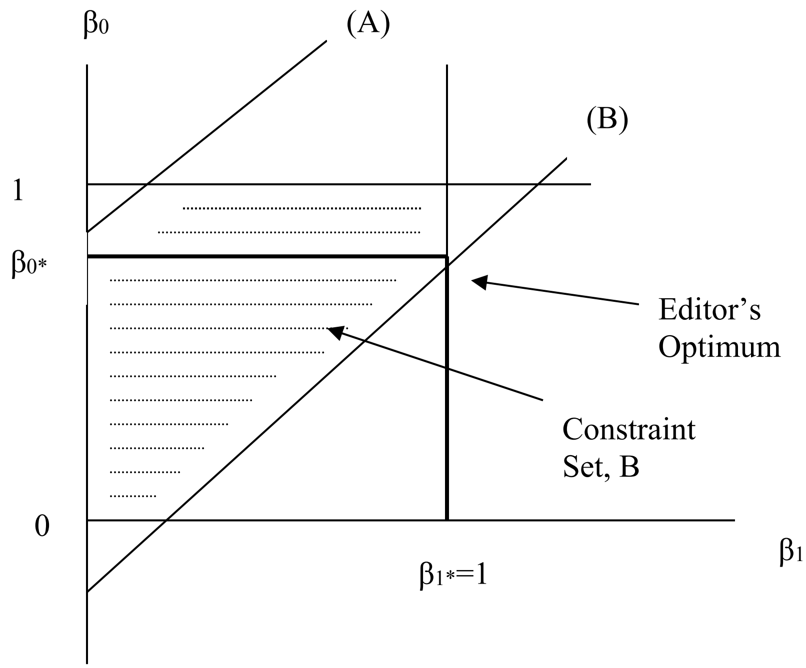


**Figure 1. Endogenous Referee Assignments**

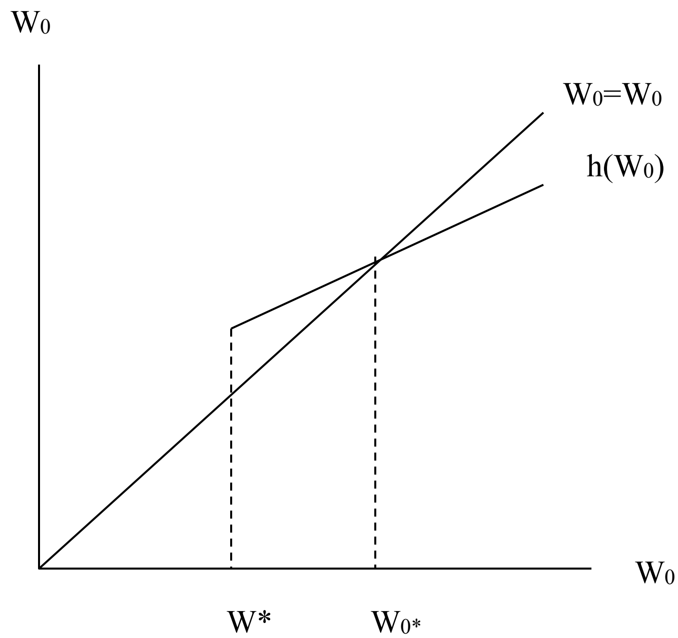


**Figure 2. Unique Asymmetric Equilibrium.**
**$W_{1*}=W^*$, $\eta_{1*}=\eta^-$, $W_{0*}>W^*$, $\eta_{0*}=\eta^+>\eta^-$.**