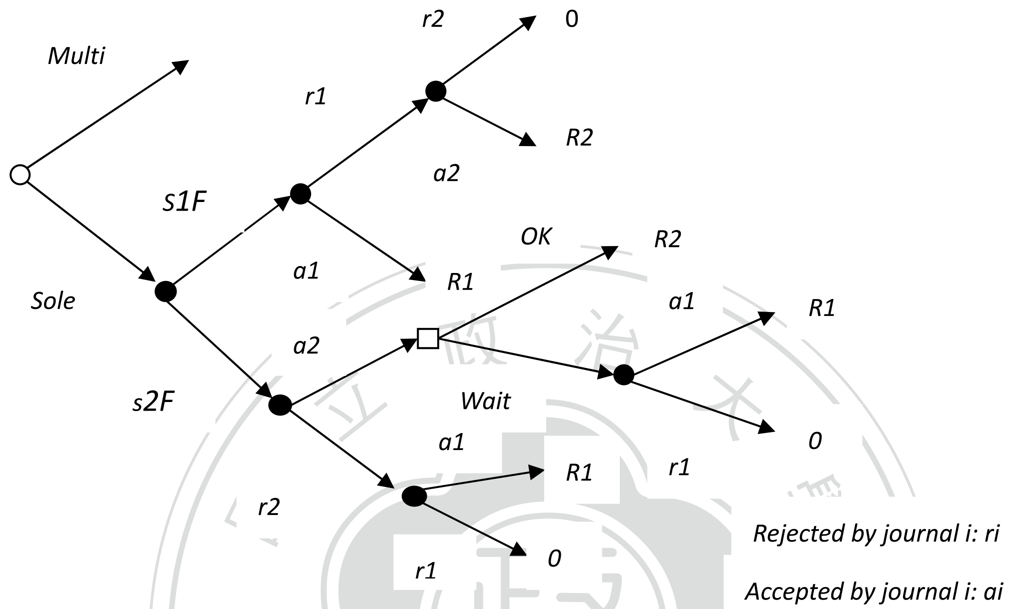
Appendix 1.

The case authors give up the acceptance of Journal 2 when submitting with the strategy $\mathbf{V(J_2, J_1)}$ in the model without time-delay consideration and symmetric referee delays of both journals. (Section 2.2)



We first discuss the decision node (the square mark in Figure 2). The author may face a dilemma whether he should accept the acceptance of Journal 2 or wait for the response of the more prestigious Journal 1 when sole-submitting to Journal 2 first. And the decision would depend on the writing ability of the author.

Let $\hat{q}$ solve the indifferent condition.

(A-1) $$P_1(\hat{q})R_1 = R_2.$$

Equation (A-1) means that the author with writing ability $\hat{q}$ is indifferent between getting the acceptance of Journal 2 immediately and giving up the acceptance and resubmit the Journal 1. And since the higher the writing ability increases the probability to be accepted, the authors with quality higher than $\hat{q}$ would be better off giving up the offer of Journal 2 and submit Journal 1. Then the choice of the author would be as follows when sole-submitting to Journal 2 first:

$$\begin{cases} \text{To get } R_2 \text{ immediately, if } q \le \hat{q} \\ \text{Wait for reply of Journal 1, if } q > \hat{q} \end{cases}$$

Then we have two possible expected value of sole-submitting to Journal 2 first.

$$V(J_2, J_1 | q \leq \hat{q}) = P_2R_2 + (1 - P_2)P_1R_1$$

$$V(J_2, J_1 | q > \hat{q}) = P_1R_1$$

Then we have the following relations,

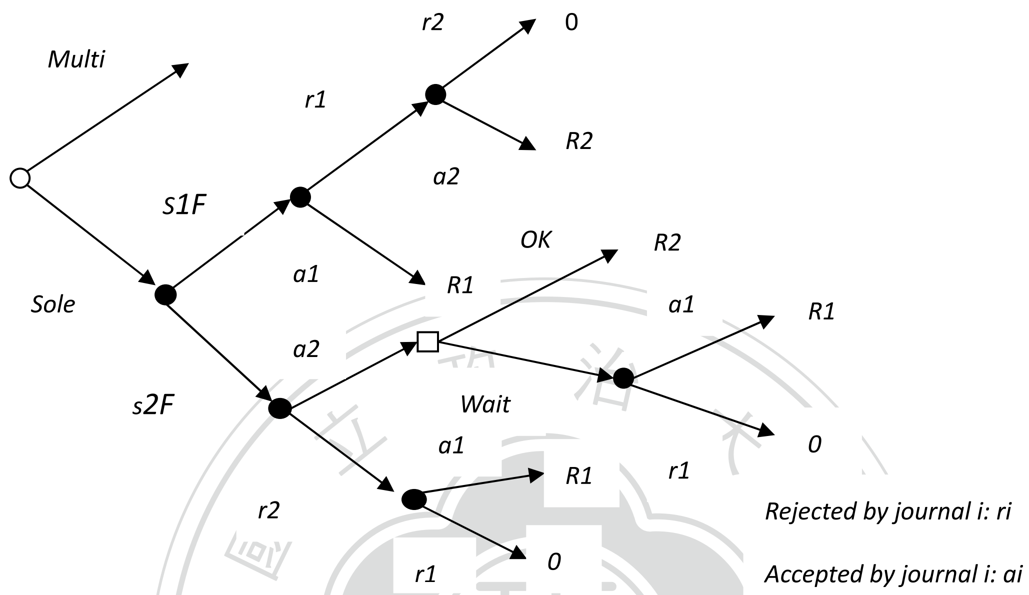
$$V(J_1, J_2) > V(J_2, J_1 | q \leq \hat{q})$$

$$V(J_1, J_2) > V(J_2, J_1 | q > \hat{q})$$

With the results above, authors always sole-submit Journal 1 first if the submission rule is sole-submission. It doesn't affect the result we had presented in Section 2.2 where we presume authors accept the acceptance of Journal 2 immediately when sole-submitting to Journal 2 first.

Appendix 2.

The case authors give up the acceptance of Journal 2 when sole-submitting to Journal first in the model with time-delay consideration and symmetric referee delays of both journals. (Chapter 3)



Similarly, authors are faced with the dilemma whether to accept the acceptance of Journal 2 immediately or not in the square decision node when sole-submitting to Journal 2 first. The definition would be quite the same as we set in the former section, but we define the $\hat{q}$ as a different value from the previous one. $\hat{q}$ solves the following equation here.

(A-2) $$\delta P_1(\hat{q})R_1 = R_2$$

The equation (A-2) means that the author with quality $\hat{q}$ feels indifferent between getting the acceptance of Journal 2 immediately and giving up the acceptance and resubmit to the Journal 1. And since the higher the writing ability increases the probability to be accepted, the authors with quality higher than $\hat{q}$ will be better off giving up the acceptance of Journal 2 and resubmit to Journal 1.

Then the choice of the authors would be as follows when sole-submitting to Journal 2 first:

$$\begin{cases} \text{To recieve } R_2 \text{ immediately, if } q \leq \hat{q} \\ \text{Wait for reply of Journal 1, if } q > \hat{q} \end{cases}$$

Then we have two possible expected value of sloe-submitting to Journal 2 first.

$$V(J_2, J_1 | q \leq \hat{q}) = P_2R_2 + \delta(1 - P_2)P_1R_1$$

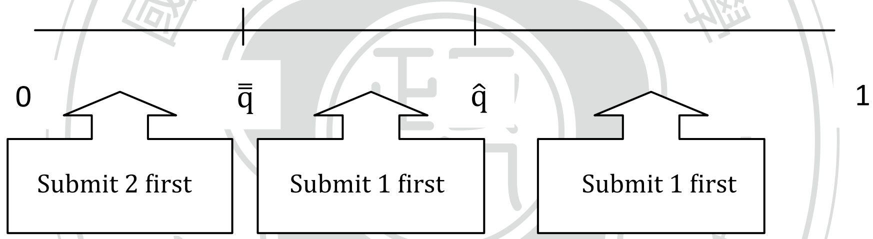
$$V(J_2, J_1 | q > \hat{q}) = \delta P_1 R_1$$

Since $\hat{q}$ is always greater than $\bar{\bar{q}}$, we establish the following inequality.[13]

$$V(J_1, J_2) \lesseqqgtr V(J_2, J_1) \text{ if } q \lesseqqgtr \bar{\bar{q}}$$

$$V(J_1, J_2) > V(J_2, J_1 | q > \hat{q})$$

And we can have the following submission chart with respect to the authors' writing ability.



FigureA.1 The submission segment of authors involving the waiting case

With the results above, in the sole-submission, authors with q higher than $\bar{\bar{q}}$ always sole-submit to Journal 1 first. And the others with lower q will choose to sole-submit to Journal 2 first. As same as the previous section, it doesn't affect the result we had presented in Chapter 3 where we presume authors accept the acceptance of Journal 2 immediately when sole-submitting to Journal 2 first.

[13] The proof of $\hat{q} > \bar{\bar{q}}$ is proved in Appendix3.

Appendix 3.

Relative locations between $\hat{q}$ and $\bar{\bar{q}}$ in Appendix 2.

We have known that $\hat{q}$ solves,

$$\delta P_1(\hat{q})R_1 = R_2$$

and $\bar{\bar{q}}$ for

$$\frac{R_1}{R_2} = \frac{(1-\delta+\delta P_1(\bar{\bar{q}}))}{(1-\delta+\delta P_2(\bar{\bar{q}}))}\frac{P_2(\bar{\bar{q}})}{P_1(\bar{\bar{q}})}.$$

Rearranging both equations, we have the following equation:

$$\frac{1}{\delta P_1(\hat{q})} = \frac{R_1}{R_2} = \frac{(1-\delta+\delta P_1(\bar{\bar{q}}))}{(1-\delta+\delta P_2(\bar{\bar{q}}))}\frac{P_2(\bar{\bar{q}})}{P_1(\bar{\bar{q}})}$$

$$\left(1-\delta+\delta P_2(\bar{\bar{q}})\right)P_1(\bar{\bar{q}}) = (1-\delta+\delta P_1(\bar{\bar{q}}))P_2(\bar{\bar{q}})\delta P_1(\hat{q})$$

With the equation above we can know that $P_1(\bar{\bar{q}}) < P_2(\bar{\bar{q}})\delta P_1(\hat{q})$ with the fact that $\left(1-\delta+\delta P_2(\bar{\bar{q}})\right) > (1-\delta+\delta P_1(\bar{\bar{q}}))$. And we can derive the following relation:

(A-3) $$P_1(\bar{\bar{q}}) < \delta P_1(\hat{q})P_2(\bar{\bar{q}})$$

With the very fact that δ and $P_2(\bar{\bar{q}}) \in (0,1)$, we can see the $P_1(\hat{q})$ must be greater than $P_1(\bar{\bar{q}})$. Then the $\hat{q}$ must be greater than $\bar{\bar{q}}$ according to the presumption $\frac{\partial P_1(\gamma_i,q)}{\partial q} > 0$.

Appendix 4.

Relative positions of the $\bar{\bar{q}}_a$ and $\hat{q}$ in Chapter 4.

We have known that $\bar{\bar{q}}_a$ and $\hat{q}$ solve the following equations respectively,

$$\hat{q}: \frac{1}{t_2}R_2 = \frac{1}{t_1}P_1(\hat{q})R_1$$

$$\bar{\bar{q}}_a: \frac{R_1 t_2}{R_2 t_1} = \frac{P_2(\bar{\bar{q}}_a)}{P_1(\bar{\bar{q}}_a)} \frac{(t_1+t_2P_1(\bar{\bar{q}}_a))}{(t_2+t_1P_2(\bar{\bar{q}}_a))}$$

We then rearrange them as:

$$\frac{1}{P_1(\hat{q})} = \frac{R_1 t_2}{R_2 t_1} = \frac{P_2(\bar{\bar{q}}_a)}{P_1(\bar{\bar{q}}_a)} \frac{(t_1+t_2P_1(\bar{\bar{q}}_a))}{(t_2+t_1P_2(\bar{\bar{q}}_a))}$$

$$P_1(\bar{\bar{q}}_a) \frac{(t_2+t_1P_2(\bar{\bar{q}}_a))}{(P_1(\bar{\bar{q}}_a)P_2(\bar{\bar{q}}_a)t_2+t_1P_2(\bar{\bar{q}}_a))} = P_1(\hat{q})$$

Since $\frac{(t_2+t_1P_2(\bar{\bar{q}}_a))}{(P_1(\bar{\bar{q}}_a)P_2(\bar{\bar{q}}_a)t_2+t_1P_2(\bar{\bar{q}}_a))} > 1$, we can derive $P_1(\bar{\bar{q}}_a) < P_1(\hat{q})$. And with $\frac{\partial P_1(\gamma_i,q)}{\partial q} > 0$ we conclude that $\bar{\bar{q}}_a$ is smaller than $\hat{q}$.

Appendix 5.

The relative positions of $\bar{\bar{q}}_a$,$\tilde{q}$ and $\hat{q}$ in Chapter 4.

We have known each parameter solves the following equations respectively,

(A-4) $$\hat{q}: \frac{1}{t_2}R_2 = \frac{1}{t_1}P_1(\hat{q})R_1$$

(A-5) $$\tilde{q}: (t_1 + t_2)\frac{t_2}{t_1}\frac{R_1}{R_2} = \frac{t_1+t_2P_1}{P_1}$$

(A-6) $$\bar{\bar{q}}_a: \frac{R_1t_2}{R_2t_1} = \frac{P_2(\bar{\bar{q}}_a)}{P_1(\bar{\bar{q}}_a)}\frac{(t_1+t_2P_1(\bar{\bar{q}}_a))}{(t_2+t_1P_2(\bar{\bar{q}}_a))}$$

First, we shows that $\tilde{q}$ is smaller than $\hat{q}$. We have the following equation after rearranging equations (A-4) and (A-5).

$$\frac{1}{P_1(\hat{q})} = \frac{R_1t_2}{R_2t_1} = \frac{t_1+t_2P_1(\tilde{q})}{P_1(\tilde{q})(t_1+t_2)}$$

(A-7) $$\frac{P_1(\tilde{q})}{P_1(\hat{q})} = \frac{t_1+t_2P_1(\tilde{q})}{(t_1+t_2)}$$

Since $P_1(\tilde{q})$ is less than one, the term of the right hand side in equation (A-7) is less than one. Then we have $P_1(\tilde{q}) < P_1(\hat{q})$. And with $\frac{\partial P_1(\gamma_i,q)}{\partial q} > 0$ we can conclude that $\tilde{q}$ is not greater than $\hat{q}$. We have the equation below after rearranging equations (A-5) and (A-6).

$$\frac{t_1+t_2P_1(\tilde{q})}{P_1(\tilde{q})(t_1+t_2)} = \frac{R_1t_2}{R_2t_1} = \frac{P_2(\bar{\bar{q}}_a)}{P_1(\bar{\bar{q}}_a)}\frac{(t_1+t_2P_1(\bar{\bar{q}}_a))}{(t_2+t_1P_2(\bar{\bar{q}}_a))}$$

$$\frac{P_1(\bar{\bar{q}}_a)(t_1+t_2P_1(\tilde{q}))}{P_1(\tilde{q})(t_1+t_2P_1(\bar{\bar{q}}_a))} = \frac{(t_1+t_2)}{(t_2+t_1P_2(\bar{\bar{q}}_a))}P_2(\bar{\bar{q}}_a)$$

(A-8) $$\frac{P_1(\bar{\bar{q}}_a)t_1+t_2P_1(\bar{\bar{q}}_a)P_1(\tilde{q})}{P_1(\tilde{q})t_1+t_2P_1(\bar{\bar{q}}_a)P_1(\tilde{q})} = \frac{t_1P_2(\bar{\bar{q}}_a)+t_2P_2(\bar{\bar{q}}_a)}{t_1P_2(\bar{\bar{q}}_a)+t_2} < 1$$

Since $P_2(\bar{\bar{q}}_a)$ is less than one, the term of the right hand side of equation (A-8) is less than one. Then the equation holds if and only if $P_1(\bar{\bar{q}}_a) < P_1(\tilde{q})$. And with $\frac{\partial P_1(\gamma_i,q)}{\partial q} > 0$ we conclude that $\bar{\bar{q}}_a$ is smaller than $\tilde{q}$.