Appendix

A1 Formal Equilibrium Analysis

A1.1 Independent Suppliers and Quantity Competition

A1.1.1 Manufacturers' Best Response Functions

Under quantity competition, manufacturer i's inverse demand is given by $p_i = 1 - q_i - \theta q_j$. Let $\tilde{c}_i$ be manufacturer j and supplier j's belief of c_i. Under passive beliefs, $\tilde{c}_i$ satisfies that

$$\tilde{c}_i = \begin{cases} c_i & \text{if manufacturer } i \text{ discloses,} \\ c_i^* & \text{otherwise,} \end{cases}$$

where c_i^* is the equilibrium cost c_i. That is, if manufacturer i discloses its cost information, manufacturer j's belief must be correct. If manufacturer i does not disclose, manufacturer j believes that supplier i has played the equilibrium strategy and charged manufacturer i an equilibrium input price c_i^* (consistency of beliefs).

We next derive the manufacturers' best response functions. We conjecture that the manufacturers' strategy profiles are as follows (which we confirm later):

$$q_1 = \alpha_0 + \alpha_1 c_1 + \alpha_2 \tilde{c}_1 + \alpha_3 \tilde{c}_2, \tag{A1}$$

$$q_2 = \beta_0 + \beta_1 c_2 + \beta_2 \tilde{c}_2 + \beta_3 \tilde{c}_1. \tag{A2}$$

Note that manufacturer 1 does not always observe c_2 directly. It replaces c_2 with $\tilde{c}_2$ in (A2) and forms belief regarding q_2. Under a perfect Bayesian equilibrium, manufacturer 1's belief of q_2 is given by

$$\tilde{q}_2 = \beta_0 + (\beta_1 + \beta_2)\tilde{c}_2 + \beta_3 \tilde{c}_1. \tag{A3}$$

Manufacturer 1 chooses q_1 to maximize its anticipated profit, that is,

$$\tilde{\pi}_1 = (1 - q_1 - \theta \tilde{q}_2 - c_1) q_1.$$

Optimizing manufacturer 1's anticipated profit we have

$$q_1 = \frac{1 - c_1 - \theta(\beta_0 + \beta_3 \tilde{c}_1 + (\beta_1 + \beta_2)\tilde{c}_2)}{2}. \tag{A4}$$

Comparing (A1) with (A4), we have

$$\alpha_0 = \frac{1 - \theta\beta_0}{2},\ \alpha_1 = -\frac{1}{2},\ \alpha_2 = -\frac{\theta\beta_3}{2},\ \alpha_3 = -\frac{\theta(\beta_1 + \beta_2)}{2}. \tag{A5}$$

Similarly, for manufacturer 2, we have

$$\beta_0 = \frac{1 - \theta\alpha_0}{2},\ \beta_1 = -\frac{1}{2},\ \beta_2 = -\frac{\theta\alpha_3}{2},\ \beta_3 = -\frac{\theta(\alpha_1 + \alpha_2)}{2}. \tag{A6}$$

Using (A5) and (A6), we obtain the manufacturers' strategy profiles as follows.

$$\alpha_0 = \beta_0 = \frac{1}{2+\theta},\ \alpha_1 = \beta_1 = -\frac{1}{2},\ \alpha_2 = \beta_2 = -\frac{\theta^2}{2(4-\theta^2)},\ \alpha_3 = \beta_3 = \frac{\theta}{4-\theta^2}.$$

Next, we derive the equilibrium outcome of each subgame.

A1.1.2 Both manufacturers disclose

When both manufacturers disclose, information is perfect and we have that $\tilde{c}_1^D = c_1^D$ and $\tilde{c}_2^D = c_2^D$. The analysis is straightforward and is thus omitted.

A1.1.3 Neither manufacturer discloses

Now, consider the subgame in which neither manufacturer discloses. In this case, the consistency of beliefs dictates that beliefs must be correct, i.e., $\tilde{c}_1^N = c_1^{N*}$ and $\tilde{c}_2^N = c_2^{N*}$. Plugging the manufacturers' beliefs into their best response functions, we come up with

$$q_1^N = \frac{1}{2+\theta} - \frac{c_1^N}{2} - \frac{\theta^2}{2(4-\theta^2)} \cdot c_1^{N*} + \frac{\theta}{4-\theta^2} \cdot c_2^{N*}.$$

Supplier 1's profit $\pi_1^N = c_1^N q_1^N$ is maximized at $c_1^N = c_1^{N*}$. The first-order condition yields that

$$c_1^{N*} = \frac{4-\theta(2-2c_2^{N*}+\theta c_1^{N*})}{2(4-\theta^2)}.$$

Similarly, we obtain that

$$c_2^{N*} = \frac{4-\theta(2-2c_1^{N*}+\theta c_2^{N*})}{2(4-\theta^2)}.$$

Solving for c_1^{N*} and c_2^{N*}, we obtain

$$c_1^{N*} = c_2^{N*} = \frac{2}{4+\theta}.$$

The firms' equilibrium profits are

$$\Pi_i^N = \frac{2}{(4+\theta)^2}, \ \ \pi_i^N = \frac{1}{(4+\theta)^2}.$$

A1.1.4 Asymmetric Disclosure Policies

Assume that manufacturer 1 chooses disclosure while manufacturer 2 chooses nondisclosure. Then, we have $\tilde{c}_1^{DN} = c_1^{DN}$ and $\tilde{c}_2^{DN} = c_2^{DN*}$ (consistency of beliefs). Plugging the manufacturers' belief into their best response functions, we have

$$q_1^{DN} = \frac{2-2c_1^{DN}-\theta+\theta c_2^{DN*}}{4-\theta^2}, \ \ q_2^{DN} = \frac{1}{2+\theta} - \frac{c_2^{DN}}{2} - \frac{\theta^2}{2(4-\theta^2)} \cdot c_2^{DN*} + \frac{\theta}{4-\theta^2} \cdot c_1^{DN}.$$

Supplier i's profit $\pi_i^{DN} = c_i^{DN} q_i^{DN}$ is maximized at $c_i^{DN} = c_i^{DN*}$. The first-order condition yields that

$$c_1^{DN*} = \frac{2-\theta(1-c_2^{DN*})}{4}, \ \ c_2^{DN*} = \frac{8-\theta(2+\theta+\theta c_2^{DN*})}{4(4-\theta^2)}.$$

Solving for c_1^{DN*} and c_2^{DN*}, we come up with

$$c_1^{DN*} = \frac{(4-\theta)(2-\theta)(2+\theta)}{32-6\theta^2}, \;\; c_2^{DN*} = \frac{(2-\theta)(4+\theta)}{16-3\theta^2}.$$

The firms' equilibrium profits are

$$\Pi_1^{DN} = \frac{(4-\theta)^2(4-\theta^2)}{2(16-3\theta^2)^2}, \;\; \Pi_2^{DN} = \frac{(2-\theta)^2(4+\theta)^2}{2(16-3\theta^2)^2},$$

$$\pi_1^{DN} = \frac{(4-\theta)^2}{(16-3\theta^2)^2}, \;\; \pi_2^{DN} = \frac{(2-\theta)^2(4+\theta)^2}{4(16-3\theta^2)^2}.$$

The manufacturers' profits in the subgames are summarized in Table 1 of the manuscript. The suppliers' profits are summarized below.

		S2	
		D	N
S1	D	$\left(\frac{2(2-\theta)}{(4-\theta)^2(2+\theta)}, \frac{2(2-\theta)}{(4-\theta)^2(2+\theta)}\right)$	$\left(\frac{(4-\theta)^2(4-\theta^2)}{2(16-3\theta^2)^2}, \frac{(2-\theta)^2(4+\theta)^2}{2(16-3\theta^2)^2}\right)$
	N	$\left(\frac{(2-\theta)^2(4+\theta)^2}{2(16-3\theta^2)^2}, \frac{(4-\theta)^2(4-\theta^2)}{2(16-3\theta^2)^2}\right)$	$\left(\frac{2}{(4+\theta)^2}, \frac{2}{(4+\theta)^2}\right)$

Table A1: Suppliers' payoff matrix (independent suppliers, quantity competition)

The total channel profit is

$$\Pi_c = \begin{cases} \frac{4(6-\theta^2)}{(4-\theta)^2(2+\theta)^2} & \text{if both costs are disclosed,} \\ \frac{384-192\theta-56\theta^2+28\theta^3+\theta^4}{4(16-3\theta^2)^2} & \text{if only one cost is disclosed,} \\ \frac{6}{(4+\theta)^2} & \text{if neither cost is disclosed.} \end{cases} \tag{A7}$$

A1.2 Independent Suppliers and Price Competition

In this section, we solve for the equilibrium outcome when the manufacturers compete on price and source from independent suppliers.

A1.2.1 Manufacturers' Best Response Functions

Under price competition, manufacturer i's demand is given by $D_i = 1 - p_i + \theta(p_j - p_i)$. Let $\tilde{c}_i$ be manufacturer j and supplier j's belief of c_i, which satisfies that

$$\tilde{c}_i = \begin{cases} c_i & \text{if manufacturer } i \text{ discloses,} \\ c_i^* & \text{otherwise,} \end{cases}$$

where c_i^* is the equilibrium cost c_i.

We next derive the manufacturers' best response functions. We conjecture that the manufacturers' strategy profiles are as follows (which we confirm later):

$$p_1 = \alpha_0 + \alpha_1 c_1 + \alpha_2 \tilde{c}_1 + \alpha_3 \tilde{c}_2, \tag{A8}$$

$$p_2 = \beta_0 + \beta_1 c_2 + \beta_2 \tilde{c}_2 + \beta_3 \tilde{c}_1. \tag{A9}$$

Note that manufacturer 1 does not always observe c_2 directly. In this case, a perfect Bayesian equilibrium requires that manufacturer 1 replaces c_2 with $\tilde{c}_2$ in (A9) and forms belief regarding p_2. Therefore, we have

$$\tilde{p}_2 = \beta_0 + (\beta_1 + \beta_2)\tilde{c}_2 + \beta_3 \tilde{c}_1. \tag{A10}$$

Manufacturer 1 chooses p_1 to maximize its anticipated profit, that is,

$$\tilde{\pi}_1 = (1 - p_1 + \theta(\tilde{p}_2 - p_1))(p_1 - c_1).$$

Optimizing manufacturer 1's anticipated profit we have

$$p_1 = \frac{1 + c_1 + \theta(c_1 + \beta_0 + \tilde{c}_2(\beta_1 + \beta_2) + \tilde{c}_1 \beta_3)}{2(1+\theta)}. \tag{A11}$$

Comparing (A8) with (A11), we have

$$\alpha_0 = \frac{1 + \theta\beta_0}{2(1+\theta)},\ \alpha_1 = \frac{1}{2},\ \alpha_2 = \frac{\theta\beta_3}{2(1+\theta)},\ \alpha_3 = \frac{\theta(\beta_1 + \beta_2)}{2(1+\theta)}. \tag{A12}$$

Similarly, for manufacturer 2, we have

$$\beta_0 = \frac{1+\theta\alpha_0}{2(1+\theta)},\ \beta_1 = \frac{1}{2},\ \beta_2 = \frac{\theta\alpha_3}{2(1+\theta)},\ \beta_3 = \frac{\theta(\alpha_1+\alpha_2)}{2(1+\theta)}. \tag{A13}$$

Using (A12) and (A13), we come up with

$$\alpha_0 = \beta_0 = \frac{1}{2+\theta},\ \alpha_1 = \beta_1 = \frac{1}{2},\ \alpha_2 = \beta_2 = \frac{\theta^2}{8+16\theta+6\theta^2},\ \alpha_3 = \beta_3 = \frac{\theta(1+\theta)}{4+8\theta+3\theta^2}.$$

A1.2.2 Both manufacturers disclose

When both manufacturers disclose, information is perfect and we have that $\tilde{c}_1^D = c_1^D$ and $\tilde{c}_2^D = c_2^D$. The analysis is straightforward, and the equilibrium outcome is

$$c_i^{D*} = \frac{2+3\theta}{4+7\theta+\theta^2}.$$

The firms' equilibrium profits are

$$\Pi_i^D = \frac{(1+\theta)(2+3\theta)(2+4\theta+\theta^2)}{(2+\theta)(4+7\theta+\theta^2)^2},\ \ \pi_i^D = \frac{(1+\theta)(2+4\theta+\theta^2)^2}{(2+\theta)^2(4+7\theta+\theta^2)^2}.$$

A1.2.3 Neither manufacturer discloses

When neither manufacturer discloses, we have $\tilde{c}_1^N = c_1^{N*}, \tilde{c}_2^N = c_2^{N*}$ (consistency of beliefs). Plugging the manufacturers' beliefs into their best response functions, we have

$$p_1^N = \frac{1}{2+\theta} + \frac{c_1^N}{2} + \frac{\theta^2}{8+16\theta+6\theta^2}\cdot c_1^{N*} + \frac{\theta(1+\theta)}{4+8\theta+3\theta^2}\cdot c_2^{N*},\ \tilde{p}_1^N = \frac{1}{2+\theta} + \frac{\theta(1+\theta)}{4+8\theta+3\theta^2}\cdot c_2^{N*} + \frac{2(1+\theta)^2}{4+8\theta+3\theta^2}\cdot c_1^{N*}.$$

p_2^N and $\tilde{p}_2^N$ can be obtained similarly.

Supplier 1's profit $\pi_1^N = c_1^N(1 - p_1^N + \theta(\tilde{p}_2^N - p_1^N))$ is maximized at $c_1^N = c_1^{N*}$, which yields that

$$c_1^{N*} = \frac{4+2(3+\tilde{c}_2^N)\theta + (\tilde{c}_1^N + 2\tilde{c}_2^N)\theta^2}{8+16\theta+6\theta^2}.$$

Similarly, we have

$$c_2^{N*} = \frac{4 + 2(3 + \tilde{c}_1^N)\theta + (\tilde{c}_2^N + 2\tilde{c}_1^N)\theta^2}{8 + 16\theta + 6\theta^2}.$$

Solving for c_1^{N*} and c_2^{N*}, we come up with

$$c_1^{N*} = c_2^{N*} = \frac{2}{4+\theta}.$$

The firms' equilibrium profits are

$$\Pi_i^N = \frac{2(1+\theta)}{(4+\theta)^2}, \;\; \pi_i^N = \frac{1+\theta}{(4+\theta)^2}.$$

A1.2.4 Asymmetric Disclosure Policies

Assume that manufacturer 1 chooses disclosure whereas manufacturer 2 chooses nondisclosure. Then, we have $\tilde{c}_1^{DN} = c_1^{DN}$ and $\tilde{c}_2^{DN} = c_2^{DN*}$ (consistency of beliefs). Plugging the manufacturers' beliefs into their best response functions, we have

$$p_1^{DN} = \frac{1}{2+\theta} + \frac{2(1+\theta)^2}{4+8\theta+3\theta^2} \cdot c_1^{DN} + \frac{\theta(1+\theta)}{4+8\theta+3\theta^2} \cdot c_2^{DN*},$$

$$p_2^{DN} = \frac{1}{2+\theta} + \frac{c_2^{DN}}{2} + \frac{\theta^2}{8+16\theta+6\theta^2} \cdot c_2^{DN*} + \frac{\theta(1+\theta)}{4+8\theta+3\theta^2} \cdot c_1^{DN},$$

$$\tilde{p}_1^{DN} = \frac{1}{2+\theta} + \frac{2(1+\theta)^2}{4+8\theta+3\theta^2} \cdot c_1^{DN} + \frac{\theta(1+\theta)}{4+8\theta+3\theta^2} \cdot c_2^{DN*},$$

$$\tilde{p}_2^{DN} = \frac{1}{2+\theta} + \frac{2(1+\theta)^2}{4+8\theta+3\theta^2} \cdot c_2^{DN*} + \frac{\theta(1+\theta)}{4+8\theta+3\theta^2} \cdot c_1^{DN}.$$

Supplier i's profit $\pi_i^{DN} = c_i^{DN}(1 - p_i^{DN} + \theta(\tilde{p}_j^{DN} - p_i^{DN}))$ is maximized at $c_i^{DN} = c_i^{DN*}$. The first-order condition yields that

$$c_1^{DN*} = \frac{2 + \theta(3 + c_2^{DN*} + c_2^{DN*}\theta)}{4 + 2\theta(4+\theta)}, \;\; c_2^{DN*} = \frac{8 + \theta(30 + \theta(33 + 9\theta + c_2^{DN*}(3 + 2\theta(3+\theta))))}{2(2+\theta)(2+3\theta)(2+\theta(4+\theta))}.$$

Solving for c_1^{DN*} and c_2^{DN*}, we reach the followings.

$$c_1^{DN*} = \frac{(2+\theta)(2+3\theta)(4+7\theta)}{32+2\theta(64+\theta(81+34\theta+4\theta^2))}, \; c_2^{DN*} = \frac{(2+3\theta)(4+3\theta(3+\theta))}{16+\theta(64+\theta(81+34\theta+4\theta^2))}.$$

The firms' equilibrium profits are

$$\Pi_1^{DN} = \frac{(1+\theta)(2+\theta)(2+3\theta)(4+7\theta)^2(2+\theta(4+\theta))}{4(16+\theta(64+\theta(81+34\theta+4\theta^2)))^2}, \; \Pi_2^{DN} = \frac{(1+\theta)(2+3\theta)^2(4+3\theta(3+\theta))^2}{2(16+\theta(64+\theta(81+34\theta+4\theta^2)))^2}.$$

$$\pi_1^{DN} = \frac{(1+\theta)(4+7\theta)^2(2+\theta(4+\theta))^2}{4(16+\theta(64+\theta(81+34\theta+4\theta^2)))^2}, \; \pi_2^{DN} = \frac{(1+\theta)(2+3\theta)^2(4+3\theta(3+\theta))^2}{4(16+\theta(64+\theta(81+34\theta+4\theta^2)))^2}$$

The manufacturers' profits in the subgames are summarized in Table 2 of the manuscript. The suppliers' profits are summarized below.

		S2: D	S2: N
S1	D	$\frac{(1+\theta)(2+3\theta)(2+4\theta+\theta^2)}{(2+\theta)(4+7\theta+\theta^2)^2}, \frac{(1+\theta)(2+3\theta)(2+4\theta+\theta^2)}{(2+\theta)(4+7\theta+\theta^2)^2}$	$\left(\frac{(1+\theta)(2+\theta)(2+3\theta)(4+7\theta)^2(2+\theta(4+\theta))}{4(16+\theta(64+\theta(81+34\theta+4\theta^2)))^2}, \frac{(1+\theta)(2+3\theta)^2(4+3\theta(3+\theta))^2}{2(16+\theta(64+\theta(81+34\theta+4\theta^2)))^2}\right)$
	N	$\left(\frac{(1+\theta)(2+3\theta)^2(4+3\theta(3+\theta))^2}{2(16+\theta(64+\theta(81+34\theta+4\theta^2)))^2}, \frac{(1+\theta)(2+\theta)(2+3\theta)(4+7\theta)^2(2+\theta(4+\theta))}{4(16+\theta(64+\theta(81+34\theta+4\theta^2)))^2}\right)$	$\left(\frac{2(1+\theta)}{(4+\theta)^2}, \frac{2(1+\theta)}{(4+\theta)^2}\right)$

Table A2: Suppliers' payoff matrix (independent suppliers, price competition)

The total channel profit is

$$\Pi_c = \begin{cases} \frac{4(1+\theta)(3+6\theta+2\theta^2)(2+4\theta+\theta^2)}{(2+\theta)^2(4+7\theta+\theta^2)^2} & \text{if both costs are disclosed,} \\ \frac{384+3264\theta+11432\theta^2+21196\theta^3+22201\theta^4+12935\theta^5+3817\theta^6+439\theta^7}{4(16+64\theta+81\theta^2+34\theta^3+4\theta^4)^2} & \text{if only one cost is disclosed,} \\ \frac{6(1+\theta)}{(4+\theta)^2} & \text{if neither cost is disclosed.} \end{cases} \tag{A14}$$

A1.3 Common Supplier and Quantity Competition

A1.3.1 Both manufacturers disclose

When both manufacturers disclose, information is perfect and we have that $\tilde{c}_1^D = c_1^D$ and $\tilde{c}_2^D = c_2^D$. The analysis is straightforward, and the equilibrium outcome is $c_1^{D*} = c_2^{D*} = \frac{1}{2}$. In equilibrium, the firms' profits are

$$\Pi^D = \frac{1}{4+2\theta}, \ \ \pi_1^D = \pi_2^D = \frac{1}{4(2+\theta)^2}.$$

A1.3.2 Neither manufacturer discloses

Following the analysis of Section A1.1.3, we have

$$q_i^N = \frac{1}{2+\theta} - \frac{c_i^N}{2} - \frac{\theta^2}{2(4-\theta^2)} \cdot c_i^{N*} + \frac{\theta}{4-\theta^2} \cdot c_j^{N*}.$$

The supplier's profit is $\Pi^N = c_1^N q_1^N + c_2^N q_2^N$, which is maximized at $c_1^N = c_1^{N*}$ and $c_2^N = c_2^{N*}$. Using the first-order conditions we come up with

$$c_1^{N*} = \frac{4-\theta(2-2c_2^{N*}+\theta c_1^{N*})}{2(4-\theta^2)}, \ \ c_2^{N*} = \frac{4-\theta(2-2c_1^{N*}+\theta c_2^{N*})}{2(4-\theta^2)}.$$

Solving for c_1^{N*} and c_2^{N*}, we obtain

$$c_1^{N*} = c_2^{N*} = \frac{2}{4+\theta}.$$

The firms' equilibrium profits are

$$\Pi^N = \frac{4}{(4+\theta)^2}, \ \ \pi_1^N = \pi_2^N = \frac{1}{(4+\theta)^2}.$$

A1.3.3 Asymmetric disclosure policies

Assume without loss of generality that only manufacturer 1 chooses disclosure. Following the analysis of Section A1.1.4, we have

$$q_1^{DN} = \frac{2-2c_1^{DN}-\theta+\theta c_2^{DN*}}{4-\theta^2}, \ \ q_2^{DN} = \frac{1}{2+\theta} - \frac{c_2^{DN}}{2} - \frac{\theta^2}{2(4-\theta^2)} \cdot c_2^{DN*} + \frac{\theta}{4-\theta^2} \cdot c_1^{DN}.$$

The supplier's profit is $\Pi^{DN} = c_1^{DN} q_1^{DN} + c_2^{DN} q_2^{DN}$, which is maximized at $c_1^{DN} = c_1^{DN*}$ and $c_2^{DN} = c_2^{DN*}$. Solving the supplier's profit maximization problem we come up with

$$c_1^{DN*} = \frac{16 - \theta(4 + 2(3-\theta)\theta - c_2^{DN*}(8 - 3\theta^2))}{32 - 10\theta^2}, \; c_2^{DN*} = \frac{8 - \theta(2 + \theta + c_2^{DN*}\theta)}{16 - 5\theta^2}.$$

Solving for c_1^{DN*} and c_2^{DN*}, we obtain

$$c_1^{DN*} = \frac{8 + 4\theta - \theta^2}{8(2+\theta)}, \; c_2^{DN*} = \tilde{c}_2^{DN} = \frac{4+\theta}{8+4\theta}.$$

The firms' equilibrium profits are

$$\Pi^{DN} = \frac{32 + 16\theta - \theta^2}{32(2+\theta)^2}, \; \pi_1^{DN} = \frac{1}{4(2+\theta)^2}, \; \pi_2^{DN} = \frac{(4+\theta)^2}{64(2+\theta)^2}.$$

The manufacturers' profits in the subgames are summarized in Table 3 of the manuscript. The supplier's profit is

$$\Pi = \begin{cases} \frac{1}{4+2\theta} & \text{if both costs are disclosed,} \\ \frac{32+16\theta-\theta^2}{32(2+\theta)^2} & \text{if only one cost is disclosed,} \\ \frac{4}{(4+\theta)^2} & \text{if neither cost is disclosed.} \end{cases} \tag{A15}$$

The total channel profit is

$$\Pi_c = \begin{cases} \frac{3+\theta}{2(2+\theta)^2} & \text{if both costs are disclosed,} \\ \frac{96+40\theta-\theta^2}{64(2+\theta)^2} & \text{if only one cost is disclosed,} \\ \frac{6}{(4+\theta)^2} & \text{if neither cost is disclosed.} \end{cases} \tag{A16}$$

A1.4 Common Supplier and Price Competition

A1.4.1 Both manufacturers disclose

When both manufacturers disclose, information is perfect and we have that $\tilde{c}_1^D = c_1^D$ and $\tilde{c}_2^D = c_2^D$. The analysis is straightforward, and the equilibrium outcome is

$$c_1^{D*} = c_2^{D*} = \frac{1}{2}.$$

The firms' equilibrium profits are

$$\Pi^D = \frac{1+\theta}{4+2\theta}, \quad \pi_1^D = \pi_2^D = \frac{1+\theta}{4(2+\theta)^2}.$$

A1.4.2 Neither Manufacturer Discloses

Following the analysis of Section A1.2.3, we have

$$p_i^N = \frac{1}{2+\theta} + \frac{c_i^N}{2} + \frac{\theta^2}{8+16\theta+6\theta^2} \cdot c_i^{N*} + \frac{\theta(1+\theta)}{4+8\theta+3\theta^2} \cdot c_j^{N*}, \;\; \tilde{p}_j^N = \frac{1}{2+\theta} + \frac{2(1+\theta)^2}{4+8\theta+3\theta^2} \cdot c_j^{N*} + \frac{\theta(1+\theta)}{4+8\theta+3\theta^2} \cdot c_i^{N*}.$$

The supplier's profit is $\Pi^N = \sum_i c_i^N(1 - p_i^N + \theta(\tilde{p}_j^N - p_i^N))$, which is maximized at $c_1^N = c_1^{N*}$ and $c_2^N = c_2^{N*}$. Using the first-order conditions we come up with

$$c_i^{N*} = \frac{4 + 2(3 + c_j^{N*})\theta + (c_i^{N*} + 2c_j^{N*})\theta^2}{8+16\theta+6\theta^2}.$$

Solving for c_1^{N*} and c_2^{N*}, we obtain

$$c_1^{N*} = c_2^{N*} = \frac{2}{4+\theta}.$$

The firms' equilibrium profits are

$$\Pi^N = \frac{4(1+\theta)}{(4+\theta)^2}, \quad \pi_1^N = \pi_2^N = \frac{1+\theta}{(4+\theta)^2}.$$

A1.4.3 Asymmetric disclosure policies

Assume without loss of generality that only manufacturer 1 chooses disclosure. Following the analysis of Section A1.2.4, we have

$$p_1^{DN} = \frac{1}{2+\theta} + \frac{2(1+\theta)^2}{4+8\theta+3\theta^2} \cdot c_1^{DN} + \frac{\theta(1+\theta)}{4+8\theta+3\theta^2} \cdot c_2^{DN*},$$

$$p_2^{DN} = \frac{1}{2+\theta} + \frac{c_2^{DN}}{2} + \frac{\theta^2}{8+16\theta+6\theta^2} \cdot c_2^{DN*} + \frac{\theta(1+\theta)}{4+8\theta+3\theta^2} \cdot c_1^{DN},$$

$$\tilde{p}_1^{DN} = \frac{1}{2+\theta} + \frac{2(1+\theta)^2}{4+8\theta+3\theta^2} \cdot c_1^{DN} + \frac{\theta(1+\theta)}{4+8\theta+3\theta^2} \cdot c_2^{DN*},$$

$$\tilde{p}_2^{DN} = \frac{1}{2+\theta} + \frac{2(1+\theta)^2}{4+8\theta+3\theta^2} \cdot c_2^{DN*} + \frac{\theta(1+\theta)}{4+8\theta+3\theta^2} \cdot c_1^{DN}.$$

The supplier's profit is $\Pi^{DN} = \sum_i c_i^{DN}(1 - p_i^{DN} + \theta(\tilde{p}_j^{DN} - p_i^{DN}))$, which is maximized at

$$c_1^{DN*} = \frac{16+\theta(60+70\theta+24\theta^2+c_2^{DN*}(1+\theta)(8+\theta(16+7\theta)))}{32+2\theta(64+\theta(83+\theta(38+5\theta)))},$$

$$c_2^{DN*} = \frac{8+\theta(30+\theta(33+9\theta+c_2^{DN*}(3+2\theta(3+\theta))))}{16+\theta(64+\theta(83+\theta(38+5\theta)))}.$$

Solving for c_1^{DN*} and c_2^{DN*}, we obtain

$$c_1^{DN*} = \frac{8+\theta(20+9\theta)}{2(2+\theta)(4+\theta(8+\theta))}, \;\; \tilde{c}_2^{DN} = c_2^{DN*} = \frac{4+3\theta(3+\theta)}{(2+\theta)(4+\theta(8+\theta))}.$$

The firms' equilibrium profits are

$$\Pi^{DN} = \frac{(1+\theta)(64+288\theta+414\theta^2+200\theta^3+27\theta^4)}{4(2+\theta)^2(4+\theta(8+\theta))^2}, \;\; \pi_1^{DN} = \frac{1+\theta}{4(2+\theta)^2}, \;\; \pi_2^{DN} = \frac{(1+\theta)(4+3\theta(3+\theta))^2}{4(2+\theta)^2(4+\theta(8+\theta))^2}.$$

The manufacturers' profits in the subgames are summarized in Table 4 of the manuscript. The supplier's profit is

$$\Pi = \begin{cases} \frac{1+\theta}{4+2\theta} & \text{if both costs are disclosed,} \\ \frac{(1+\theta)(64+288\theta+414\theta^2+200\theta^3+27\theta^4)}{4(2+\theta)^2(4+\theta(8+\theta))^2} & \text{if only one cost is disclosed,} \\ \frac{4(1+\theta)}{(4+\theta)^2} & \text{if neither cost is disclosed.} \end{cases} \tag{A17}$$

The total channel profit is

$$\Pi_c = \begin{cases} \frac{1}{2} - \frac{1}{2(2+\theta)^2} & \text{if both costs are disclosed,} \\ \frac{(1+\theta)(96+424\theta+591\theta^2+270\theta^3+37\theta^4}{4(2+\theta)^2(4+\theta(8+\theta))^2} & \text{if only one cost is disclosed,} \\ \frac{6(1+\theta)}{(4+\theta)^2} & \text{if neither cost is disclosed.} \end{cases} \tag{A18}$$

A2 Proof of Proposition 9

Independent suppliers and quantity competition. Inputting equilibrium prices into consumer surplus and social welfare, we find that consumer surplus and social welfare under disclosure and nondisclosure are

$$CS^D = \frac{4(1+\theta)}{(4-\theta)^2(2+\theta)^2}, \;\; SW^D = \frac{4(7+\theta-\theta^2)}{(4-\theta)^2(2+\theta)^2},$$

$$CS^N = \frac{1+\theta}{(4+\theta)^2}, \;\; SW^N = \frac{7+\theta}{(4+\theta)^2}.$$

It follows immediately that $CS^D > CS^N$ and $SW^D > SW^N$.

Independent suppliers and price competition. Inputting equilibrium prices into consumer surplus and social welfare, we find that consumer surplus and social welfare under disclosure and nondisclosure are

$$CS^D = \frac{(1+\theta)^2(2+4\theta+\theta^2)^2}{(2+\theta)^2(4+7\theta+\theta^2)^2}, \;\; SW^D = \frac{(1+\theta)(2+4\theta+\theta^2)(14+\theta(3+\theta)(10+\theta))}{(2+\theta)^2(4+7\theta+\theta^2)^2},$$

$$CS^N = \frac{(1+\theta)^2}{(4+\theta)^2}, \;\; SW^N = 1 - \frac{9}{(4+\theta)^2}.$$

It follows immediately that $CS^D < CS^N$ and $SW^D < SW^N$.

Common supplier and quantity competition. Inputting equilibrium prices into consumer surplus and social welfare, we find that consumer surplus and social welfare under disclosure and nondisclosure are

$$CS^D = \frac{(1+\theta)}{4(2+\theta)^2}, \; SW^D = \frac{7+3\theta}{4(2+\theta)^2}, \; CS^N = \frac{1+\theta}{(4+\theta)^2}, \; SW^N = \frac{7+\theta}{(4+\theta)^2}.$$

It follows immediately that $CS^D < CS^N$ and $SW^D < SW^N$.

Common supplier and price competition. Inputting equilibrium prices into consumer surplus and social welfare, we find that consumer surplus and social welfare under disclosure and nondisclosure are

$$CS^D = \frac{(1+\theta)^2}{4(2+\theta)^2}, \; SW^D = \frac{(1+\theta)(7+3\theta)}{4(2+\theta)^2}, \; CS^N = \frac{(1+\theta)^2}{(4+\theta)^2}, \; SW^N = 1 - \frac{9}{(4+\theta)^2}.$$

It follows immediately that $CS^D < CS^N$ and $SW^D < SW^N$.

A3 Analysis under Wary Beliefs

In the basic model, we assume that the manufacturers adopt passive beliefs, meaning manufacturer i does not update its belief regarding c_j upon receiving an unexpected offer $c_i \neq c_i^*$ from its supplier (i.e., it continues to hold the belief that $\tilde{c}_j = c_j^*$). When the manufacturers source from independent suppliers, passive beliefs are reasonable because the contract terms between supplier j and retailer j should not depend on c_i, which is not observed by supplier j when c_j is chosen. However, when both manufacturers source from a common supplier, a supplier who deviates and offers manufacturer i a price $c_i \neq c_i^*$, could plausibly offer manufacturer j an off-equilibrium price as well.

In this section, we consider an alternative belief specification, *wary beliefs*, when the manufacturers source from a common supplier. Initially proposed by McAfee and Schwartz (1994), wary beliefs have been widely used in games of imperfect information (Rey and Vergé, 2004).

Under wary beliefs, a manufacturer who receives an off-equilibrium contract offer from a common supplier believes that the supplier will adjust its offer to the rival manufacturer to maximize its own profit. And, more importantly, each manufacturer is convinced that the other manufacturer shares the same belief (McAfee and Schwartz, 1994).

We prove the following proposition (for the detailed analysis, see Appendices A3.1 and A3.2):

Proposition A1 *Suppose that the manufacturers source from a common supplier and that they adopt wary beliefs. Under either price or quantity competition, there exists a unique subgame-perfect equilibrium, in which neither manufacturer discloses.*

Proposition A1 suggests that our main results are not altered under wary beliefs and that both manufacturers conceal their cost information in equilibrium. The intuition is familiar: By committing to withholding its cost information, a manufacturer is able to secure a lower procurement cost from the upstream supplier and make a higher profit.

A3.1 Common Supplier and Quantity Competition

First, consider a case in which both manufacturers disclose their cost information. In this case, information is perfect and the equilibrium outcome is not affected. Second, consider a case in which neither manufacturer discloses. Suppose that the supplier offers a price c_1^N to manufacturer 1. Let $R(c_1^N)$ denote the optimal price that the supplier charges manufacturer 2, given that manufacturer 1's input price is c_1^N. Furthermore, let $\tilde{R}(c_1^N)$ denote manufacturer 1's belief of c_2^N, given that its own cost is c_1^N, and let $\Pi(c_1^N, c_2^N)$ denote the supplier's total profit from both manufacturers. Wary beliefs dictate that

$$R(c_1^N) = \arg\max_{w} \ \Pi(c_1^N, w). \tag{A19}$$

Put differently, the price pair $(c_1^N, R(c_1^N))$ maximizes the supplier's profit, given that the supplier charges manufacturer 1 a price c_1^N. Equation (A19) can be translated into

$$R(c_1^N) = \arg\max_w \; c_1^N \cdot q_1^N(c_1^N, \tilde{R}(c_1^N)) + w \cdot q_2^N(w, \tilde{R}(w)). \tag{A20}$$

Note that w does not appear on the first term on the right-hand side, and we can rewrite Equation (A20) as

$$R(c_1^N) = \arg\max_w \; w \cdot q_2^N(w, \tilde{R}(w)). \tag{A21}$$

It follows immediately from Equation (A21) that $R(c_1^N)$ is independent of c_1^N. In other words, manufacturer 1 should not update its belief regarding c_2^N upon receiving an expected offer from the supplier, and manufacturer 2 must share the same reasoning. In this regard, wary beliefs coincide with passive beliefs, and the equilibrium outcome is not affected.

The situation becomes more complicated when the manufacturers adopt asymmetric disclosure decisions. Assume without loss of generality that only manufacturer 1 discloses. We conjecture that there exists an equilibrium in which manufacturer 1's belief is linear in its cost, denoted by $\tilde{c}_2^{DN} = \alpha_0 + \alpha_1 c_1^{DN}$. It follows that the manufacturers' quantity decisions are

$$q_1^{DN} = \frac{2(1 - c_1^{DN}) - \theta + (\alpha_0 + \alpha_1 c_1^{DN})\theta}{4 - \theta^2}, \;\; q_2^{DN} = \frac{4 - (4 - \theta^2)c_2^{DN} - \theta(2 + \alpha_0\theta - c_1^{DN}(2 - \alpha_1\theta))}{2(4 - \theta^2)}.$$

Maximizing the supplier's total profit, we find

$$c_2^{DN} = \frac{4 - \theta(2 + \alpha_0\theta - c_1^{DN}(2 - \alpha_1\theta))}{2(4 - \theta^2)}.$$

Using the consistency of beliefs (i.e., $\tilde{c}_2^{DN} = c_2^{DN*}$ in equilibrium), we obtain

$$\alpha_0 = \frac{4 - 2\theta}{8 - \theta^2}, \;\; \alpha_1 = \frac{2\theta}{8 - \theta},$$

and that the equilibrium costs are

$$c_1^{DN} = \frac{32-(8-\theta)\theta^2}{64-12\theta^2},\ \ c_2^{DN} = \frac{16-4\theta-\theta^2}{32-6\theta^2}.$$

The manufacturers' equilibrium profits are

$$\pi_1^{DN} = \frac{4(2-\theta)^2}{(16-3\theta^2)^2},\ \ \pi_2^{DN} = \frac{(16-4\theta-\theta^2)^2}{16(16-3\theta^2)^2}.$$

We summarize the equilibrium outcome in Table A3. It follows immediately that, in equilibrium, neither manufacturer discloses.

		Manufacturer 2: D	Manufacturer 2: N
Manufacturer 1	D	$\left(\frac{1}{4(2+\theta)^2}, \frac{1}{4(2+\theta)^2}\right)$	$\left(\frac{4(2-\theta)^2}{(16-3\theta^2)^2}, \frac{(16-4\theta-\theta^2)^2}{16(16-3\theta^2)^2}\right)$
	N	$\left(\frac{(16-4\theta-\theta^2)^2}{16(16-3\theta^2)^2}, \frac{4(2-\theta)^2}{(16-3\theta^2)^2}\right)$	$\left(\frac{1}{(4+\theta)^2}, \frac{1}{(4+\theta)^2}\right)$

Table A3: Payoff matrix (common supplier, quantity competition)

A3.2 Common Supplier and Price Competition

Consider, again, the case in which both manufacturers disclose their cost information. In this case, information is perfect, and the equilibrium outcome is not affected. Then, consider the case in which neither manufacturer discloses. Suppose that the supplier offers a price c_1^N to manufacturer 1. Let $R(c_1^N)$ denote the optimal price that the supplier charges manufacturer 2, given that manufacturer 1's cost is c_1^N. Furthermore, let $\tilde{R}(c_1^N)$ denote manufacturer 1's belief of c_2^N, given that its own cost is c_1^N, and let $\Pi(c_1^N, c_2^N)$ denote the supplier's total profit from both manufacturers. Wary beliefs dictate that

$$R(c_1^N) = \arg\max_w \ \Pi(c_1^N, w). \tag{A22}$$

That is, the price pair $(c_1^N, R(c_1^N))$ maximizes the supplier's profit, given that the supplier charges manufacturer 1 a price c_1^N. Equation (A22) can be translated into

$$R(c_1^N) = \arg\max_{w} \; c_1^N \cdot q_1^N(c_1^N, \tilde{R}(c_1^N)) + w \cdot q_2^N(w, \tilde{R}(w)). \tag{A23}$$

Note that w does not appear on the first term on the right-hand side, and we can rewrite Equation (A23) as

$$R(c_1^N) = \arg\max_{w} \; w \cdot q_2^N(w, \tilde{R}(w)). \tag{A24}$$

It follows immediately from Equation (A24) that $R(c_1^N)$ is independent of c_1^N. In other words, manufacturer 1 should not update its belief regarding c_2^N upon receiving an expected offer from the supplier, and manufacturer 2 must share the same reasoning. Wary beliefs, again, coincide with passive beliefs and the equilibrium outcome will not be affected.

As with the case under quantity competition, the situation becomes more complicated when the manufacturers adopt asymmetric disclosure decisions. Assume without loss of generality that only manufacturer 1 discloses. We conjecture that there exists an equilibrium in which manufacturer 1's belief is linear in its cost, denoted by $\tilde{c}_2^{DN} = \alpha_0 + \alpha_1 c_1^{DN}$. It follows that the manufacturers' pricing decisions are

$$p_1^{DN} = \frac{2 + \theta(3 + \alpha_0 + \alpha_0\theta) + c_1^{DN}(1+\theta)(2 + (2+\alpha_1)\theta)}{(2+\theta)(2+3\theta)},$$

$$p_2^{DN} = \frac{4 + c_2^{DN}(2+\theta)(2+3\theta) + \theta(6 + \alpha_0\theta + c_1^{DN}(2 + (2+\alpha_1)\theta))}{2(2+\theta)(2+3\theta)}.$$

Maximizing the supplier's total profit, we find

$$c_2^{DN} = \frac{4 + \theta(6 + \alpha_0\theta + c_1^{DN}(2 + (2+\alpha_1)\theta))}{2(2+\theta)(2+3\theta)}.$$

Using the consistency of beliefs, i.e., $\tilde{c}_2^{DN} = c_2^{DN*}$ in equilibrium, we obtain

$$\alpha_0 = \frac{4+6\theta}{8+\theta(16+5\theta)}, \;\; \alpha_1 = \frac{2\theta(1+\theta)}{8+\theta(16+5\theta)},$$

and that the equilibrium costs are

$$c_1^{DN} = \frac{32+\theta(128+\theta(152+47\theta))}{64+2\theta(128+\theta(154+\theta(52+3\theta)))}, \; c_2^{DN} = \frac{16+\theta(60+\theta(63+13\theta))}{32+\theta(128+\theta(154+\theta(52+3\theta)))}.$$

The manufacturers' equilibrium profits are

$$\pi_1^{DN} = \frac{(1+\theta)(16+\theta(56+(48-\theta)\theta))^2}{4(32+\theta(128+\theta(154+\theta(52+3\theta))))^2}, \; \pi_2^{DN} = \frac{(1+\theta)(16+\theta(60+\theta(63+13\theta)))^2}{4(32+\theta(128+\theta(154+\theta(52+3\theta))))^2}.$$

We summarize the equilibrium outcome in the following table. It follows immediately that in equilibrium, neither manufacturer discloses.

		M2: D	M2: N
M1	D	$\left(\frac{1+\theta}{4(2+\theta)^2}, \frac{1+\theta}{4(2+\theta)^2}\right)$	$\left(\frac{(1+\theta)(16+\theta(56+(48-\theta)\theta))^2}{4(32+\theta(128+\theta(154+\theta(52+3\theta))))^2}, \frac{(1+\theta)(16+\theta(60+\theta(63+13\theta)))^2}{4(32+\theta(128+\theta(154+\theta(52+3\theta))))^2}\right)$
	N	$\left(\frac{(1+\theta)(16+\theta(60+\theta(63+13\theta)))^2}{4(32+\theta(128+\theta(154+\theta(52+3\theta))))^2}, \frac{(1+\theta)(16+\theta(56+(48-\theta)\theta))^2}{4(32+\theta(128+\theta(154+\theta(52+3\theta))))^2}\right)$	$\left(\frac{1+\theta}{(4+\theta)^2}, \frac{1+\theta}{(4+\theta)^2}\right)$

Table A4: Payoff matrix (common supplier, price competition)

A4 Supplier-Initiated Disclosure

In this section we derive the equilibrium outcome when the suppliers make the disclosure decision.

Independent Suppliers and Quantity Competition

In Table A1 of Appendix A1.1, we have obtained the suppliers' payoff under different disclosure policies, which we reproduce as follows. It is worth noting that for each disclosure subgame, it does not matter who makes the disclosure decision. For example, when both suppliers choose disclosure, the equilibrium outcome is identical to that when both manufacturers choose disclosure.

		S2: D	S2: N
S1	D	$\left(\frac{2(2-\theta)}{(4-\theta)^2(2+\theta)}, \frac{2(2-\theta)}{(4-\theta)^2(2+\theta)}\right)$	$\left(\frac{(4-\theta)^2(4-\theta^2)}{2(16-3\theta^2)^2}, \frac{(2-\theta)^2(4+\theta)^2}{2(16-3\theta^2)^2}\right)$
	N	$\left(\frac{(2-\theta)^2(4+\theta)^2}{2(16-3\theta^2)^2}, \frac{(4-\theta)^2(4-\theta^2)}{2(16-3\theta^2)^2}\right)$	$\left(\frac{2}{(4+\theta)^2}, \frac{2}{(4+\theta)^2}\right)$

Table A5: Suppliers' payoff matrix (independent suppliers, quantity competition)

Straightforward calculation shows that there exist two equilibria: (1) Both suppliers disclose and (2) neither supplier discloses. Moreover, we find that the suppliers' profits are higher when neither of them discloses, which is the Pareto-dominant equilibrium.

Independent Suppliers and Price Competition

In Table A2 of Appendix A1.2, we have obtained the suppliers' payoff under different disclosure policies, which we reproduce as follows.

		S2: D	S2: N
S1	D	$\frac{(1+\theta)(2+3\theta)(2+4\theta+\theta^2)}{(2+\theta)(4+7\theta+\theta^2)^2}, \frac{(1+\theta)(2+3\theta)(2+4\theta+\theta^2)}{(2+\theta)(4+7\theta+\theta^2)^2}$	$\left(\frac{(1+\theta)(2+\theta)(2+3\theta)(4+7\theta)^2(2+\theta(4+\theta))}{4(16+\theta(64+\theta(81+34\theta+4\theta^2)))^2}, \frac{(1+\theta)(2+3\theta)^2(4+3\theta(3+\theta))^2}{2(16+\theta(64+\theta(81+34\theta+4\theta^2)))^2}\right)$
	N	$\left(\frac{(1+\theta)(2+3\theta)^2(4+3\theta(3+\theta))^2}{2(16+\theta(64+\theta(81+34\theta+4\theta^2)))^2}, \frac{(1+\theta)(2+\theta)(2+3\theta)(4+7\theta)^2(2+\theta(4+\theta))}{4(16+\theta(64+\theta(81+34\theta+4\theta^2)))^2}\right)$	$\left(\frac{2(1+\theta)}{(4+\theta)^2}, \frac{2(1+\theta)}{(4+\theta)^2}\right)$

Table A6: Suppliers' payoff matrix (independent suppliers, price competition)

Straightforward calculation shows that there exists a unique equilibrium in which both suppliers disclose their input prices.

Common Supplier and Quantity Competition

In Equation (A15) of Appendix A1.3, we have obtained the supplier's payoff under different disclosure policies, which we reproduce as follows.

$$\Pi = \begin{cases} \frac{1}{4+2\theta} & \text{if both costs are disclosed,} \\ \frac{32+16\theta-\theta^2}{32(2+\theta)^2} & \text{if only one cost is disclosed,} \\ \frac{4}{(4+\theta)^2} & \text{if neither cost is disclosed.} \end{cases} \tag{A25}$$

Straightforward calculation shows that the supplier's profit is maximized when disclosing both manufacturers' input prices.

Common Supplier and Price Competition

In Equation (A17) of Appendix A1.4, we have obtained the supplier's payoff under different disclosure policies, which we reproduce as follows.

$$\Pi = \begin{cases} \frac{1+\theta}{4+2\theta} & \text{if both costs are disclosed,} \\ \frac{(1+\theta)(64+288\theta+414\theta^2+200\theta^3+27\theta^4)}{4(2+\theta)^2(4+\theta(8+\theta))^2} & \text{if only one cost is disclosed,} \\ \frac{4(1+\theta)}{(4+\theta)^2} & \text{if neither cost is disclosed.} \end{cases} \tag{A26}$$

Straightforward calculation shows that the supplier's profit is maximized when disclosing both manufacturers' input prices.

A5 Analysis of the Model with Both Endogenous and Exogenous Costs

We consider the case in which the manufacturers that source from a common supplier compete on quantity. Other cases can be analyzed similarly.

Both manufacturers disclose

Suppose that both manufacturers commit to disclosing their cost information. A straightforward calculation shows that the manufacturers' ex-ante expected profits are

$$\pi_1^D = \pi_2^D = \frac{1}{16}\left(\frac{2\Delta^2}{(2-\theta)^2} + \frac{4-4\Delta+3\Delta^2}{(2+\theta)^2}\right).$$

Neither manufacturer discloses

Suppose that both manufacturers commit to concealing their cost information. Because of the uncertainty concerning manufacturing costs (m_i), the manufacturers' equilibrium production decision, q_i^N, is also stochastic; therefore, $\tilde{q}_i^N$, manufacturer j's belief about q_i^N, is a probability distribution (instead of a constant). Let $E[\tilde{q}_i^N]$ denote the expectation of $\tilde{q}_i^N$, which is, of course, a constant.

Given c_1^N, m_1 (which is observed by manufacturer 1), and $\tilde{q}_2^N$, manufacturer 1 chooses q_1^N to maximize its expected profit:

$$\pi_1^N = E\left[q_1^N(1-q_1^N-\theta\tilde{q}_2^N-m_1-c_1^N)\right] = q_1^N(1-q_1^N-\theta E[\tilde{q}_2^N]-m_1-c_1^N).$$

Using the first-order condition, we obtain

$$q_1^N = \begin{cases} q_{1H}^N = \frac{1-c_1^N-\Delta-E[\tilde{q}_2^N]\theta}{2} & \text{if } m_i = \Delta, \\ q_{1L}^N = \frac{1-c_1^N-E[\tilde{q}_2^N]\theta}{2} & \text{otherwise.} \end{cases}$$

Similarly, we obtain q_2^N. We then consider the supplier. It chooses c_1^N and c_2^N to maximize its expected profit, $\Pi^N = E[c_1^N q_1^N + c_2^N q_2^N] = c_1^N E[q_1^N] + c_2^N E[q_2^N]$. Plugging q_1^N, q_2^N into Π^N and maximizing the supplier's profit yields

$$c_i^N = \frac{2-\Delta-2E[\tilde{q}_j^N]\theta}{4}.$$

In equilibrium, the manufacturers' beliefs must be consistent, i.e.,

$$E[\tilde{q}_i^N] = E[q_i^N] = \frac{q_{iH}^N + q_{iL}^N}{2}.$$

Using the above conditions, we obtain the equilibrium outcome and present the manufacturers' profits as follows:

$$\pi_1^N = \pi_2^N = \frac{1}{16}\left(\Delta^2 + \frac{4(2-\Delta)^2}{(4+\theta)^2}\right).$$

Asymmetric Disclosure Policies

Lastly, consider the case in which manufacturer 1 discloses whereas manufacturer 2 conceals its cost information. The detailed analysis is similar and is therefore omitted. We present the manufacturers' expected ex-ante profits as follows.

$$\pi_1^{DN} = \frac{4(2-\theta)^4(2+\theta)^2 - 4\Delta(2-\theta)^4(2+\theta)^2 + \Delta^2(320 - 64\theta - 80\theta^2 + 32\theta^3 - 4\theta^5 + \theta^6)}{4(32 - 12\theta^2 + \theta^4)^2},$$

$$\pi_2^{DN} = \frac{4(4-\theta)^2(2-\theta)^2(2+\theta)^2 - 4\Delta(4-\theta)^2(2-\theta)^2(2+\theta)^2 + \Delta^2(1280 - 128\theta - 624\theta^2 + 64\theta^3 + 152\theta^4 - 8\theta^5 - 19\theta^6 + \theta^8)}{16(32 - 12\theta^2 + \theta^4)^2}.$$

Equilibrium Disclosure Decisions

Due to the complexity of the equilibrium outcomes, we are not able to show the equilibrium disclosure policies for all values of θ. Nonetheless, we confirm through numerical analyses that the manufacturers disclose (conceal) their cost information when Δ is large (small).

- Case 1: $\theta = 1$. The equilibrium outcomes are as follows:
  - When $\Delta \leq 0.468$, neither manufacturer discloses.
  - When $0.468 \leq \Delta \leq 0.482$, there are two equilibria: both manufacturers disclose and neither manufacturer discloses.
  - When $0.482 \leq \Delta$, both manufacturers disclose.
- Case 2: $\theta = 0.6$. The equilibrium outcomes are as follows:

- When $\Delta \leq 0.659$, neither manufacturer discloses.
- When $0.659 \leq \Delta \leq 0.678$, there are two equilibria: both manufacturers disclose and neither manufacturer discloses.
- When $0.678 \leq \Delta$, both manufacturers disclose.

- Case 3: $\theta = 0.3$. The equilibrium outcomes are as follows:
  - When $\Delta \leq 0.889$, neither manufacturer discloses.
  - When $0.889 \leq \Delta \leq 0.903$, there are two equilibria: both manufacturers disclose and neither manufacturer discloses.
  - When $0.903 \leq \Delta$, both manufacturers disclose.