Denial and punishment in war: Online appendix

A Proofs

In battle M, A's continuation payoffs from (D,D), (P,D), (D,P), and (P,P) can be derived as:

$$U_{A|M}^{DD} = \frac{(m_A)^L}{(m_A)^L + (m_B)^L} U^*_{A|(m_A,m_B-1)} + \frac{(m_B)^L}{(m_A)^L + (m_B)^L} U^*_{A|(m_A-1,m_B)} - \frac{c^D}{1-\delta} \text{(A1)}$$

$$U_{A|M}^{PD} = \frac{\varepsilon (m_A)^L}{\varepsilon (m_A)^L + (m_B)^L} U^*_{A|(m_A,m_B-1)} + \frac{(m_B)^L}{\varepsilon (m_A)^L + (m_B)^L} U^*_{A|(m_A-1,m_B)}$$
$$- \frac{(m_A)^L + (m_B)^L}{\varepsilon (m_A)^L + (m_B)^L} \frac{c^D}{1-\delta}$$

$$U_{A|M}^{DP} = \frac{(m_A)^L}{(m_A)^L + \varepsilon (m_B)^L} U^*_{A|(m_A,m_B-1)} + \frac{\varepsilon (m_B)^L}{(m_A)^L + \varepsilon (m_B)^L} U^*_{A|(m_A-1,m_B)}$$
$$- \frac{(m_A)^L + (m_B)^L}{(m_A)^L + \varepsilon (m_B)^L} \frac{c_{m_B}^{\sigma_B}}{1-\delta} \qquad \text{(A2)}$$

$$U_{A|M}^{PP} = \frac{(m_A)^L}{(m_A)^L + (m_B)^L} U^*_{A|(m_A,m_B-1)} + \frac{(m_B)^L}{(m_A)^L + (m_B)^L} U^*_{A|(m_A-1,m_B)}$$
$$- \frac{(m_A)^L + (m_B)^L}{(m_A)^L + (m_B)^L} \frac{c_{m_B}^{\sigma_B}}{\varepsilon (1-\delta)},$$

where $U^*_{i|M}$ is i's continuation payoff in battle M on the equilibrium path. Similarly, B's continuation payoffs can be derived.

By the comparison of payoffs for each $i \in \{A, B\}$, equilibria in battle M can be determined. Below j denotes i's opponent.

Claim 1 *In any battle M, strategy profiles that can constitute equilibria are listed as follows:*

(a) (D,D) if $U_{A|M}^{DD} \geq 0$ and $U_{B|M}^{DD} \geq 0$;

(b) (P,S) if $U_{B|M}^{PD} \leq 0$; (b') (S,P) if $U_{A|M}^{DP} \leq 0$;

(c) (D,S) if $U_{B|M}^{DD} \leq 0$; (c') (S,D) if $U_{A|M}^{DD} \leq 0$;

(d) (σ^{DP}, S) if $U_{B|M}^{DD} \leq 0$ and $U_{B|M}^{PD} \leq 0$; (d') (S, σ^{DP}) if $U_{A|M}^{DD} \leq 0$ and $U_{A|M}^{DP} \leq 0$;

(e) $\left(\sigma_{A|M}^{DS}, \sigma_{B|M}^{DS} \right)$ if $U_{A|M}^{DD} < 0$ and $U_{B|M}^{DD} < 0$.

Proof. Among the nine pure-strategy profiles (as in Table II), only (D,D), (D,S), (S,D), (P,S), and (S,P) can be equilibria, leaving no possibility of equilibrium for other pure-strategy profiles. (P,D) cannot be an equilibrium—$U_{A|M}^{DD} > U_{A|M}^{PD}$, because A is more likely "win" a battle by D than by P and also because A's D makes a battle against B's D shorter and less costly than P. For the same reason, (D,P) cannot be an equilibrium. Trivially, neither (P,P) nor (S,S) can be an equilibrium.

For (a, c, c'), each i's best response against j's D is D if $U_{i|M}^{DD} \geq 0$ and S if $U_{i|M}^{DD} \leq 0$.

For (b, b'), (P,S) can be an equilibrium if $U_{B|M}^{PD} \leq 0$ (or if B prefers S to D against A's P); similarly, (S,P) can be if $U_{A|M}^{DP} \leq 0$.

For (d, d') that combine (b, b') and (c, c'), if j chooses S, i gains W by D, P, or any strategy that mixes them.

For (e), where both players randomize their strategies, each player must be indifferent between the actions he takes with positive probabilities. If $U_{A|M}^{DD} < 0$ and $U_{B|M}^{DD} < 0$, there exists $\left(\sigma_{A|M}^{DS}, \sigma_{B|M}^{DS} \right)$ such that $U_{A|M}^{D\sigma_{B|M}^{DS}} = 0$ and $U_{B|M}^{\sigma_{A|M}^{DS} D} = 0$, or that A and B are indifferent between D and S. In addition, because each i prefers D to P against j's D or P (in fact, D weakly dominates P), no mixed-strategy equilibrium (other than those in (d, d') where either i chooses S for sure) can contain P with a positive probability. If P cannot be contained, the only possible mixed-strategy equilibrium is $\left(\sigma_{A|M}^{DS}, \sigma_{B|M}^{DS} \right)$. ∎

Claim 1 will be utilized to prove Claims 2, 3, and 4.

Claim 2 *In battle* $(1,1)$, *all equilibria are:*

(i) (D,D) *for* $W \in \left(W^P_{(1,1)}, \infty \right)$;

(ii) (D,D), (P,S), *and* (S,P) *for* $W \in \left(W^D_{(1,1)}, W^P_{(1,1)} \right]$;

(ii') (D,D), (σ^{DP}, S), *and* (S, σ^{DP}) *for* $W = W^D_{(1,1)}$, *where* σ^{DP} *can be any mixed strategy that contains* D *and/or* P;[1]

(iii) (σ^{DP}, S), (S, σ^{DP}), *and* $\left(\sigma^{DS}_{A|(1,1)}, \sigma^{DS}_{B|(1,1)} \right)$ *for* $W \in \left(0, W^D_{(1,1)} \right)$, *where* $\sigma^{DS}_{A|M}$ $(\sigma^{DS}_{B|M})$ *is A's (B's) mixed strategy that randomly takes* D *and* S *in* M *such that* B (A) *is indifferent between* D *and* S; *in addition,*

$$
\begin{aligned}
W^P_{(1,1)} &\equiv \frac{2c^P_1}{1-\delta} \\
W^D_{(1,1)} &\equiv \frac{2c^D}{1-\delta}.
\end{aligned}
$$

Proof. As Claim 1 shows, the equilibria depend on the signs of $U^{DD}_{A|(1,1)}$, $U^{DD}_{B|(1,1)}$, $U^{DP}_{A|(1,1)}$ and $U^{PD}_{B|(1,1)}$ (Table II). Accordingly, $U^{DD}_{A|(1,1)} \gtreqless 0$ if $W \gtreqless W^D_{(1,1)}$, and $U^{DP}_{A|(1,1)} \leq 0$ if $W \leq W^P_{(1,1)}$.

By Claim 1, equilibria in battle $(1,1)$ are listed as: (a) (D,D) if $W \geq W^D_{(1,1)}$; (b, b') (P,S) and (S,P) if $W \leq W^P_{(1,1)}$; (c, c') (D,S) and (S,D) if $W \leq W^D_{(1,1)}$; (d, d') (σ^{DP}, S) and (S, σ^{DP}) if $W \leq W^D_{(1,1)}$ and $W \leq W^P_{(1,1)}$; (e) $\left(\sigma^{DS}_{A|(1,1)}, \sigma^{DS}_{B|(1,1)} \right)$ if $W < W^D_{(1,1)}$. Because $c^D < c^P_1$, $W^D_{(1,1)} < W^P_{(1,1)}$, with which the equilibria can be summarized as in the claim. ∎

Proof of Proposition 1. The proof is immediate from Claim 2-(i). ∎

Proof of Proposition 2. As with Claim 2, A's decision depends on the signs of

---

[1] σ^{DP} can be purely D or P.

$U_{A|(2,1)}^{DD}$ and $U_{A|(2,1)}^{DP}$. By Equations (A1, A2) with $U_{i|(1,1)}^* = U_{i|(1,1)}^{DD}$ (Proposition 1),

$$
\begin{aligned}
U_{A|(2,1)}^{DD} &= \frac{2^L + \frac{1}{2}}{2^L + 1} W - \frac{2^L + 2}{2^L + 1} \frac{c^D}{1 - \delta} \\
&= \frac{2^L + \frac{1}{2}}{2^L + 1} \left(W - \frac{2^L + 2}{2^L + \frac{1}{2}} \frac{c^D}{1 - \delta} \right) \\
U_{A|(2,1)}^{DP} &= \frac{2^L + \frac{\varepsilon}{2}}{2^L + \varepsilon} W - \frac{\varepsilon c^D + \left(2^L + 1 \right) c_1^P}{\left(2^L + \varepsilon \right) \left(1 - \delta \right)} \\
&> \frac{2^L + \frac{\varepsilon}{2}}{2^L + \varepsilon} \frac{2 c_1^P}{1 - \delta} - \frac{\varepsilon c^D + \left(2^L + 1 \right) c_1^P}{\left(2^L + \varepsilon \right) \left(1 - \delta \right)} \\
&= \frac{\left(2^L - 1 \right) c_1^P + \varepsilon \left(c_1^P - c^D \right)}{\left(2^L + \varepsilon \right) \left(1 - \delta \right)},
\end{aligned}
$$

both of which are positive by Assumption 1 ($W > \frac{2 c_1^P}{1 - \delta}$) with $c^D < c_1^P$. Therefore, none of (S, D), (S, P), (S, σ^{DP}) and $\left(\sigma_{A|M}^{DS}, \sigma_{B|M}^{DS} \right)$ in Claim 1 can be an equilibrium of battle $(2, 1)$. ∎

Claim 3 *In battle $(2, 1)$, all equilibria are:*
(i) (D, D) for $W \in \left(W_{(2,1)}^P, \infty \right)$;
(ii) (D, D) and (P, S) for $W \in \left(\max \left\{ W_{(1,1)}^P, W_{(2,1)}^D \right\}, W_{(2,1)}^P \right]$;
in addition, if $W_{(1,1)}^P < W_{(2,1)}^D$, they are:
(ii') (D, D) and (σ^{DP}, S) for $W = W_{(2,1)}^D$;
(iii) (σ^{DP}, S) for $W \in \left(W_{(1,1)}^P, W_{(2,1)}^D \right)$, where

$$
\begin{aligned}
W_{(2,1)}^P &\equiv \frac{2 c^D + \left(2^{L+1} + 2 \right) c_2^P}{1 - \delta} \\
W_{(2,1)}^D &\equiv \frac{\left(2^{L+1} + 4 \right) c^D}{1 - \delta}.
\end{aligned}
$$

Proof. This proof is also based on Claim 1. Since $U_{A|(2,.1)}^{DD} > 0$ and $U_{A|(2,1)}^{DP} > 0$ by Proposition 2, equilibria in battle $(2, 1)$ depend on the signs of $U_{B|(2,1)}^{DD}$ and $U_{B|(2,1)}^{PD}$,

4

which are:

$$U_{B|(2,1)}^{DD} = \frac{1}{2^L+1}\frac{W}{2} - \frac{2^L+2}{2^L+1}\frac{c^D}{1-\delta}$$

$$U_{B|(2,1)}^{PD} = \frac{1}{2^L\varepsilon+1}\frac{W}{2} - \frac{c^D+\left(2^L+1\right)c_2^P}{\left(2^L\varepsilon+1\right)(1-\delta)},$$

by Equations (A1, A2) with A replaced with B. Hence, $U_{B|(2,1)}^{DD} \gtreqless 0$ if $W \gtreqless W_{(2,1)}^D$, and $U_{B|(2,1)}^{PD} \leq 0$ if $W \leq W_{(2,1)}^P$, where $W_{(2,1)}^D < W_{(2,1)}^P$ regardless of L by $2c^D < c_2^P$. Because $W > W_{(1,1)}^P$ (Assumption 1), equilibria in (ii', iii) are non-existent if $W_{(2,1)}^D < W_{(1,1)}^P$. ∎

Equilibria in battle $(1,2)$ can be similarly derived. They are: (D,D), (S,P) instead of (P,S), and (S,σ^{DP}) instead of (σ^{DP},S) with the corresponding conditions in Claim 3.

Proof of Lemma 1. The inequalities $W_{(1,1)}^D < W_{(1,1)}^P$ and $W_{(2,1)}^D < W_{(2,1)}^P$ are shown in the proofs of Claims 2 and 3. For $W_{(2,2)}^D < W_{(2,2)}^P$, the two thresholds can be rewritten as:

$$\begin{aligned}
W_{(2,2)}^D &= \frac{\left(2^{L+2}+6\right)c^D}{\left(2^L+1\right)(1-\delta)} \\
&= \left(4+\frac{2}{2^L+1}\right)\frac{c^D}{1-\delta} \\
W_{(2,2)}^P &= \frac{\left(2^{L+1}+4\right)(1+\varepsilon)c^D+\left(2^{L+2}+4\right)c_2^P}{\left(2^{L+1}+1+\varepsilon\right)(1-\delta)} \\
&> \frac{\left(2^{L+1}+4\right)(1+\varepsilon)c^D+\left(2^{L+2}+4\right)2c^D}{\left(2^{L+1}+1+\varepsilon\right)(1-\delta)} \\
&= \frac{5\cdot2^{L+1}+12+2^{L+1}\varepsilon+4\varepsilon}{2^{L+1}+1+\varepsilon}\frac{c^D}{1-\delta} \\
&= \left(5+\frac{7+2^{L+1}\varepsilon-\varepsilon}{2^{L+1}+1+\varepsilon}\right)\frac{c^D}{1-\delta},
\end{aligned}$$

where $2c^D < c_2^P$ is used for $W_{(2,2)}^P$, implying that $W_{(2,2)}^D < \frac{5c^D}{1-\delta}$, while $W_{(2,2)}^P > \frac{5c^D}{1-\delta}$. ∎

Claim 4 *In battle* $(2,2)$ *followed by* (D,D) *in battles* $(2,1)$ *and* $(1,2)$, *all equilibria are:*

(i) (D,D) *for* $W \in \left(W_{(2,2)}^{P}, \ \infty \right)$;

(ii) (D,D), (P,S), *and* (S,P) *for* $W \in \left(\max\left\{ W_{(1,1)}^{P}, W_{(2,2)}^{D} \right\}, W_{(2,2)}^{P} \right]$;

in addition, if $W_{(1,1)}^{P} < W_{(2,2)}^{D}$, *they are:*

(ii') (D,D), (σ^{DP}, S), *and* (S, σ^{DP}) *for* $W = W_{(2,2)}^{D}$;

(iii) (σ^{DP}, S), (S, σ^{DP}), *and* $\left(\sigma_{A|(2,2)}^{DS}, \sigma_{B|(2,2)}^{DS} \right)$ *for* $W \in \left(W_{(1,1)}^{P}, W_{(2,2)}^{D} \right)$, *where*

$$W_{(2,2)}^{P} \equiv \frac{\left(2^{L+1} + 4 \right) \left(1 + \varepsilon \right) c^{D} + \left(2^{L+2} + 4 \right) c_{2}^{P}}{\left(2^{L+1} + 1 + \varepsilon \right) \left(1 - \delta \right)}$$

$$W_{(2,2)}^{D} \equiv \frac{\left(2^{L+2} + 6 \right) c^{D}}{\left(2^{L} + 1 \right) \left(1 - \delta \right)}.$$

Proof. The proof also relies on Claim 1. By Equations (A1, A2) with $U_{A|(2,1)}^{*} = U_{B|(1,2)}^{*} = U_{A|(2,1)}^{DD}$ and $U_{B|(2,1)}^{*} = U_{A|(1,2)}^{*} = U_{B|(2,1)}^{DD}$,

$$U_{A|(2,2)}^{DD} = U_{B|(2,2)}^{DD} = \frac{W}{2} - \frac{2^{L+1} + 3}{2^{L} + 1} \frac{c^{D}}{1 - \delta}$$

$$U_{A|(2,2)}^{DP} = U_{B|(2,2)}^{PD} = \frac{2^{L+1} + 1 + \varepsilon}{\left(2^{L+1} + 2 \right) \left(1 + \varepsilon \right)} W - \frac{2^{L} + 2}{2^{L} + 1} \frac{c^{D}}{1 - \delta} - \frac{2}{1 + \varepsilon} \frac{c_{2}^{P}}{1 - \delta}.$$

The signs of them determine the equilibria: $U_{A|(2,2)}^{DD} \gtreqless 0$ if $W \gtreqless W_{(2,2)}^{D}$; $U_{A|(2,2)}^{DP} \leq 0$ if $W \leq W_{(2,2)}^{P}$, where $W_{(2,2)}^{D} < W_{(2,2)}^{P}$ by Lemma 1. ∎

Proof of Proposition 3. The proof is immediate from Claim 4. Note that for the reasons shown in the main text, (D,S), (S,D), and any mixed-strategy equilibria are excluded from the list. ∎

Proof of Lemma 2. For the comparison among $W^D_{(1,1)}$, $W^D_{(2,1)}$, and $W^D_{(2,2)}$,

$$
\begin{aligned}
W^D_{(1,1)} &= \frac{2c^D}{1-\delta} \\
W^D_{(2,1)} &= \frac{\left(2^{L+1}+4\right)c^D}{1-\delta} \\
W^D_{(2,2)} &= \frac{\left(2^{L+2}+6\right)c^D}{\left(2^L+1\right)\left(1-\delta\right)} \\
&= \left(4+\frac{2}{2^L+1}\right)\frac{c^D}{1-\delta},
\end{aligned}
$$

by which $W^D_{(2,1)} > \frac{6c^D}{1-\delta}$, while $\frac{4c^D}{1-\delta} < W^D_{(2,2)} < \frac{5c^D}{1-\delta}$.

For the comparison among $W^P_{(1,1)}$, $W^P_{(2,1)}$, and $W^P_{(2,2)}$,

$$
\begin{aligned}
W^P_{(1,1)} &= \frac{2c^P_1}{1-\delta} \\
W^P_{(2,1)} &= \frac{2c^D+\left(2^{L+1}+2\right)c^P_2}{1-\delta} \\
W^P_{(2,2)} &= \frac{\left(2^{L+1}+4\right)\left(1+\varepsilon\right)c^D+\left(2^{L+2}+4\right)c^P_2}{\left(2^{L+1}+1+\varepsilon\right)\left(1-\delta\right)} \\
&= \left(1+\frac{4}{2^{L+1}+1+\varepsilon}\right)\frac{c^D}{\left(1-\delta\right)}+\left(2+2\frac{1-\varepsilon}{2^{L+1}+1+\varepsilon}\right)\frac{c^P_2}{1-\delta},
\end{aligned}
$$

which implies $W^P_{(2,1)} > \frac{2c^D+4c^P_2}{1-\delta}$, while $\frac{2c^P_2}{1-\delta} < W^P_{(2,2)} < \frac{3c^D+3c^P_2}{(1-\delta)}$. By $c^P_1 < c^P_2$, $W^P_{(1,1)} < W^P_{(2,2)}$. In addition, it holds that $\frac{3c^D+3c^P_2}{(1-\delta)} < \frac{2c^D+4c^P_2}{1-\delta}$, or $W^P_{(2,2)} < W^P_{(2,1)}$, because $2c^D < c^P_2$. ∎

Proof of Proposition 4. (i) For $W \leq W^P_{(2,2)}$, (P,S) and (S,P) can form equilibria in battle $(2,2)$ (Claim 4-(ii)). (ii) In battles $(1,1)$, (D,D) is the unique equilibrium (Proposition 1). In battle $(2,1)$, only (D,D) and (P,S) can be equilibria for $W \in \left(W^D_{(2,1)}, W^P_{(2,1)}\right)$ (Claim 3-(ii)). In addition, since $W^P_{(2,2)} < W^P_{(2,1)}$ (Lemma 2), there exists a range of W such that $W^P_{(2,2)} < W < W^P_{(2,1)}$. ∎

B   The Pacific War: From mutual denials to one-sided punishments

The Pacific War was waged in ways our theory predicts: (i) Denials were exchanged at the early stage; (ii) Punishments were adopted by the (winning) U.S. toward the end; (iii) No or few punishments were undertaken by (losing) Japan throughout.[2]

B.1   U.S. decision to punishment

Since the loss at Pearl Harbor (December 1941), the U.S. and its Allies had remained defensive and disadvantageous for the first six months of the War. The Allies lost the Battles of Hong Kong (December 1941), Malaya (January 1942), Singapore (February 1942), Dutch East Indies (March 1942), and the Philippines (May 1942) among others. This tide was reversed in June 1942 when Japan lost the Battle of Midway. Since then, the U.S. had accomplished overwhelming victories at the Battles of Guadalcanal (February 1943), the Philippine Sea (June 1944), Leyte Gulf (October 1944), Iwo Jima (March 1945), and Okinawa (June 1945). After the summer of 1944 when Japan lost the Mariana Islands (the Absolute Zone of National Defense of 1943), the U.S. military victory of the War became evident (Alperovitz, 1995: ch. 2; Brodie, 1959: 140-141; Iokibe, 2005: 91). However, despite the successive losses in these Battles and the resulting shortage of military resources, Japan desperately continued the War. The U.S. then introduced a series of punishment campaigns, including carpet bombings on

---

[2]Few exceptions of Japan's punishments were: bombardment on Santa Barbara (February 1942) and on Oregon (June 1942); air raid on Oregon (September 1942); fire ballons (November 1944 to March 1945).

cities (March 1945),[3] starvation blockades on ports (March 1945),[4] and finally nuclear attacks on Hiroshima and Nagasaki (August 1945).[5] Only after the U.S. succeeded in these punishment campaigns, did Japan declare to surrender.

B.2   Japan's decision to surrender

As the Japanese leaders became to realize in the summer of 1944 that the War was lost, they attempted several moves to restore peace, which included former Premier Fumimaro Konoe's Memorial to the Emperor (February 1945), Premier Kuniaki Koiso's maneuver to terminate the Second Sino-Japanese War via Miao Ping (March 1945), and Marquis Koichi Kido's plan for the Moscow mediation (June 1945). These attempts all failed, in part because the Emperor himself adhered to the policy of one more strike before ending the War,[6] because the Japanese leadership remained di-

[3]After the failure in precision bombings on industry (November to December 1944), the U.S. incendiary bombings on cities were employed to bring about an early surrender and save American lives (Downes, 2008: 117-132; Pape, 1996: 94). Curtis LeMay, Franklin Roosevelt, George Marshall, and Henry Arnold were all supportive of the carpet bombings (Downes, 2008: 120-125, 131-136). Henry Stimson expressed his concern about the bombings (Hasegawa, 2005: 90; Naka, 2000b: 13).

[4]The naval blockade aimed to cut off the flow of crucial raw materials to Japan. It could also bar the return of Japanese forces overseas to the home islands (Pape, 1996: 92).

[5]The causes and reasons to use atomic bombs have been long disputed among scholars. They are: the motives to shorten the War and reduce American casualties; the "momentum" of war; the huge budget spent for the Manhattan Project; diplomatic advantage to deter the Soviet expansion in Far-East Asia and Europe; Truman's visceral sense of revenge; racial prejudice; the fear that any negotiation with the Japanese government might be taken as a sign of weakness; the vague recognition of an atomic bomb's destructive capacity; the choice of target cities without verifying their military values (Alperovitz, 1985, 1995: 643-668; Arai, 1985; Arima, 2018: 80-88; Feis, 1961; Frank, 1999: ch. 11; Hando, 2007: 171; Hasegawa, 2006: 140, 143, 182-183, 202; Ishii, 1997; Naka, 2000b: 9, 240; Nishijima, 1968; Walker, 1997: ch. 6). The decision to use atomic bombs was constrained by three precedent decisions: not to grant Japan enough time to develop serious response; not to offer Japan assurances for the Emperor; not to test the impact of the Russian declaration of war (Alperovitz, 1995: 631-632).

On the use of atomic bombs on cities, the U.S. leadership was also divided. The proponents were James Byrnes, Harry Truman, Henry Stimson, and Leslie Groves (Alperovitz, 1995; Arima, 2018: 83; Hasegawa, 2005; Naka, 2000a: 113). The opponents were Carl Spaatz, Chester Nimitz, Curtis LeMay, Douglas MacArthur, Dwight Eisenhower, Ernest King, George Marshall, Henry Arnold, James Conant, Leo Szilard, Ralph Bard, William Halsey, and William Leahy (Alperovitz, 1995; Arima, 2018: ch. 2; Ishii, 1997: 185-186; Naka, 2000b: 10, 25, 68-72, 229).

[6]The Emperor began to think of surrender only after June 1945 when Okinawa was lost (Hando, 2007: 32; Hasegawa, 2005: 68; Pape, 1996: 110).

vided,[7] and because Japan's political system needed a broad consensus to make a legitimate action (Iokibe, 2005: 153)—it took long time to produce the surrender decision.[8] Nonetheless, the terrible destruction and death from March 1945 compelled a mood of urgency on the part of peace-seekers, and made speedier and easier the acceptance of the Potsdam Declaration (Brodie, 1959: 140-141).

The reasons why Japan surrendered have been disputed among historians. While "orthodox" historians have maintained the atomic bombings as one of the major causes of Japan's surrender (Asada, 1998; Brodie, 1959: 140-141; Feis, 1961; Frank, 1999; Freedman & Dockrill, 1994; Maddox, 1995; Newman, 1995; O'Brien, 2015: 430-478), the so-called "revisionists" and their sympathizers have put more emphasis on other factors especially the Soviet entry into the War (Alperovitz, 1985, 1995; Arai, 1985; Arima, 2018: 177-183; Baldwin, 1950; Bernstein, 1995, 2007; Butow, 1954; Hasegawa, 2005, 2007; Nishijima, 1968; Pape, 1993, 1996: 89, 105; Walker, 1997). The former account corresponds to a realization of $\bar{c}$ in our risk-strategy model, while the latter corresponds to a sudden rise in m_A (where A denotes the Allies). Our theory suggests it inadequate to attribute Japan's surrender—especially

---

[7]The Supreme Council for the Direction of the War (the Big Six) remained divided toward the end of the War: Kantaro Suzuki (Prime Minister), Shigenori Togo (Minister of Foreign Affairs), and Mitsumasa Yonao (Minister of the Navy) formed the peace party; Korechika Anami (Minister of the Army), Yoshijiro Umezu (Chief of the Army General Staff Office), and Soemu Toyoda (Chief of the Navy General Staff Office) formed the war party.

[8]The Japanese political system consisted of the Government and the General Headquarters (By Article 11 of the Meiji Constitution, the Army and the Navy were regarded to be independent from the Government.) This meant that to respond to the Potsdam Declaration and the Byrnes Note, the Prime Minister, in principle, needed agreements from both the Army and Navy Chiefs in the General Headquarters as well as all Ministers in his Cabinet. In addition, among the Ministers, the Army and Navy Ministers could be served only by active-duty military officers. In effect, these constraints gave the Army and the Navy veto power. Moreover, the Emperor needed supports from his Family. The reply to the Byrnes Note was staggered by Kiichiro Hiranuma (President of the Privy Council) on August 13 when he questioned the Emperor's status articulated in the Note. A telegram from Suemasa Okamoto (an envoy extraordinary to Sweden) assisted the surrender decision, as it provided the interpretation of the Note by London newspapers that the Note would allow Japan to retain the Emperor's position (Hasegawa, 2007: ch. 6). Ultimately, the Emperor's sacred decisions to respond to the Potsdam Declaration and the Byrnes Note (August 10 and 14) were made very exceptionally without such a consensus.

when it surrendered—solely to its either military or civilian vulnerability. Even when a punishment seems to work, it does so only because of preceding denials that have made punishment effectively coercive. Denial and punishment may operate differently in shaping a war.

References

[1] Alperovitz, Gar (1985) *Atomic Diplomacy, Hiroshima and Potsdam: The Use of the Atomic Bomb and the American Confrontation with Soviet Power*. New York: Penguin Books.

[2] Alperovitz, Gar (1995) *The Decision to Use the Atomic Bomb and the Architecture of an American Myth*. New York: Alfred A. Knopf.

[3] Arai, Shinichi (1985) *Gembaku Toka heno Michi [Road to Drops of Atomic Bombs]*. Tokyo, Japan: University of Tokyo Press.

[4] Arima, Tetsuo (2018) *Gembaku: Watashitachi ha Nanimo Shiranakatta [The Atomic Bombs: We Knew Nothing]*. Tokyo, Japan: Shincho Shinsho.

[5] Asada, Sadao (1998) The shock of the atomic bomb and Japan's decision to surrender: A reconsideration. *Pacific Historical Review* 67(4): 477-512.

[6] Baldwin, Hanson W (1950) *Great Mistakes of the War*. New York, Harper.

[7] Bernstein, Barton J (1995) The atomic bombings reconsidered. *Foreign Affairs* 74(1): 135-152.

[8] Brodie, Bernard (1959) *Strategy in the Missile Age*. Princeton, NJ: Princeton University Press.

[9] Butow, Robert (1954) *Japan's Decision to Surrender*. Stanford, CA: Stanford University Press

[10] Feis, Herbert (1961) *Japan Subdued: The Atomic Bomb at the End of the War in the Pacific*. Princeton, NJ: Princeton University Press.

[11] Frank, Richard (1999) *Downfall: The End of the Imperial Japanese Empire.* New York: Penguin Books.

[12] Freedman, Lawrence & Saki Dockrill (1994) Hiroshima: A strategy of shock. In: Saki Dockrill (ed.) *From Pearl Harbor to Hiroshima: The Second World War in Asia and the Pacific, 1941-1945.* New York: Palgrave Macmillan, 191-212.

[13] Hando, Kazutoshi, ed. (2007) *Nippon no Ichiban Nagai Natsu [Japan's Longest Summer].* Tokyo, Japan: Bungei Shunju.

[14] Hasegawa, Tsuyoshi (2005) *Racing the Enemy: Stalin, Truman, and the Surrender of Japan.* Cambridge, MA: Harvard University Press.

[15] Hasegawa, Tsuyoshi (2007) The atomic bombs and the Soviet invasion: Which was more important in Japan's decision to surrender? In: Tsuyoshi Hasegawa (ed.) *The End of the Pacific War: Reappraisals.* Stanford, CA: Stanford University Press, 111-144.

[16] Iokibe, Makoto (2005) *Nichibei Senso to Sengo Nippon [War between Japan and the U.S. and Post-War Japan].* Tokyo, Japan: Kodansha Gakujutsu Bunko.

[17] Ishii, Osamu (1997) Gembaku touka no 'kettei' ['Decision' to drop atomic bombs]. In Chihiro Hosoya, Irie Akira, Kanichi Goto, and Sumio Hatano (ed.) *Taiheiyo Senso no Shuketsu: Ajia Taiheiyo no Sengo Keisei [The Close of the Pacific War: Post-War Formation of Asia-Pacific].* Tokyo, Japan: Kashiwa Shobo.

[18] Maddox, Robert James (1995) *Weapons for Victory: The Hiroshima Decision Fifty Years Later.* Columbia, MO: University of Missouri Press.

[19] Naka, Akira (2000a) *Mokusatsu: Potsudamu Sengen no Shinjitsu to Nippon no Unmei (Jo) [Ignorance: Truth of the Potsdam Declaration and Fate of Japan, Vol. I]*. Tokyo, Japan: NHK Books.

[20] Naka, Akira (2000b) *Mokusatsu: Potsudamu Sengen no Shinjitsu to Nippon no Unmei (Ge) [Ignorance: Truth of the Potsdam Declaration and Fate of Japan, Vol. II]*. Tokyo, Japan: NHK Books.

[21] Newman, Robert P (1995) *Truman and the Hiroshima Cult.* East Lansing, MI: Michigan State University Press.

[22] Nishijima, Ariatsu (1968) *Gembaku ha naze Toka Saretaka [Why Atomic Bombs Dropped]*. Tokyo, Japan: Aoki Shoten.

[23] O'Brien, Phillips Payson (2015) *How the War was Won: Air-Sea Power and Allied Victory in World War II.* New York: Cambridge University Press.

[24] Pape, Robert A (1993) Why Japan surrendered. *International Security* 18(2): 154-201.

[25] Walker, J Samuel (1997) *Prompt and Utter Destruction: Truman and the Use of Atomic Bombs against Japan.* Chapel Hill, NC: University of North Carolina Press.