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PONDARA on Potential Taiwan Strait Conflict

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PONDARA is an AI-powered system developed to enable our clients to manage their growth strategies, performances, and risks. A workgroup (WG) has been tasked to use PONDARA to model the strategic interdependence between Taiwan (T) and Mainland China (C) by applying the Noncooperative Game Theory (NCGT). As the model is created to seek a peaceful solution to a potential conflict, the WG adopts a framework for peace based on Sun Tsu's philosophy of conflict avoidance, a cultural background that both players share.

NCGT Application: The C-T Strategic Interaction

The WG utilizes NCGT principles to model the strategic interactions between C and T. The game centers on the apparent conflict between C's goal of unification and T's desire to maintain its autonomy.

The WG analyzes how different strategies, including a cooperative strategy that C may introduce, influence the decisions and potential outcomes for both players, aiming to identify possible paths towards a stable equilibrium, a peaceful solution that meets the goals of both players.

PONDARA returns the following strategy profile, outcome and payoffs for C and T as an optimal solution.

Strategy profile, (s_c, s_t)

- (Deep Integration, Maintain Autonomy)

Outcome

- C gains influence and path to unification;
- T gains economic/social benefits while preserving autonomy.

Payoffs

- **(8, 6)** a strong win-win as opposed to other options, see **workings** and **analysis** below.

Workings

A Framework for Peace

Both players are surely familiar with Sun Tsu's philosophy of conflict avoidance. Sun Tzu teaches that war is a matter of vital importance, a 'grave danger' that should not be entered into lightly. The ultimate expression of skill is not to win a hundred victories in a hundred battles, but to subdue the adversary without any fighting at all. A peaceful solution can be built upon this core tenet for achieving strategic goals by making direct confrontation an unattractive, costly, and losing proposition for any potential opponent.

Phase 1: Foundational Assessment (The Five Considerations)

A thorough and dispassionate assessment of relative strengths is required. The following is Sun Tzu's five considerations that provide a timeless model for this analysis.

- The way (vision and values): compelling direction and stakeholders believe in the cause.
- Heaven (external conditions): favourable public sentiments.
- Earth (situations): clear understanding of choke points and advantages.
- The general (leadership): exhibit wisdom, trustworthiness, humanity, courage, and discipline.
- Rules (institutions): policies, organizational structures, and procedures.

Phase 2: Strategic Posturing (Invincibility)

Conflict is avoided where the perceived cost far outweighs any potential benefit for the adversary.

- Make position unassailable: an invincible defense is the foundation of peace.
- Know yourself and know your adversary: to prevent disastrous miscalculations.
- Be non-provocative: as true strength is often hidden.

Phase 3: Shaping the Environment (Initiative and Dynamics)

Instead of reacting to threats, proactively shape the environment to control the tempo and direction of events without resorting to direct force.

- Maintain the initiative: direct initiatives towards a desirable outcome, avoiding distractions.
- Concentration: keep strengths unified focusing on primary objectives.
- Adaptable: emulate water in changing circumstances and be flexible.

Phase 4: Principles of Non-Engagement (Avoiding Traps)

A core part of avoiding conflict is knowing precisely when *not* to engage:

- The adversary is well-prepared.
- The adversary's spirit is high.
- You are at a disadvantaged position.
- You are entering a vulnerable position, pursuing a hidden strength.
- The adversary is desperate.
- You are isolated or exhausted.

With the above, the WG constructed a game to obtain a peaceful solution for a potential Taiwan conflict.

Game Structure: Players, Rules, Information Sets, Outcomes, and Payoffs

Following the NCGT framework, the WG defines the basic elements of the C-T game as follows:

- **I:** The primary players are $I = \{C, T\}$.
- **C:** Aims for unification, prioritizing national integrity, and long-term stability, while also considering economic costs and international reputation.
- **T:** Aims to preserve its autonomy, democratic system, and economic prosperity, while managing a perceived existential threat.
- **I₊:** Other actors (e.g., the USA, Japan) who can influence the game but are treated as external factors in this simplified model.
- **I₀:** Represents random events like global economic shifts, pandemics, or domestic political changes that can affect the game's environment.
- **Rules:** Historical moves, constraints and expectations that define the landscape.
 - **Historical moves**
 - 1949 - The end of the civil war establishes two rival governments, with the CCP controlling the mainland and the KMT relocating to Taiwan.
 - 1979 - The US normalizes relations with the PRC and acknowledges the 'One China' policy. Simultaneously, it enacts the Taiwan Relations Act (TRA), committing to provide Taiwan with defensive arms. This establishes the core 'strategic ambiguity' that defines the game's security parameters.
 - 1990s - Taiwan transitions into a democracy, creating a distinct political system different from that on the mainland. This difference hardens T's preference for autonomy and makes unification ideologically challenging.
 - 2000s-Present - Both sides foster deep economic ties, creating mutual dependence, which C leverages for integration, but T views it as both an economic opportunity and a strategic vulnerability.
 - **Constraints on C**
 - Unification is the CCP's cornerstone and perceived 'loss' of T would be a severe political setback, constraining C from abandoning its claim.

- The TRA and potential international coalition response create a prohibitively high military and economic cost for a direct conflict, that would risk isolation and cripple C's overall modernization program.
- C recognizes that forceful subjugation would not win over the Taiwanese population, leading to a costly and unstable occupation, constraining C to explore non-military strategies.
- **Constraints on T**
- Any act constituting a formal declaration of independence is understood to be a *casus belli* for C, constraining T from making a move that would guarantee a conflict.
- T faces a significant military imbalance with C, constraining it to a defensive, asymmetric strategy reliant on external support.
- T's economy is heavily reliant on trade with C, constraining T from pursuing a complete economic or political decoupling, as the cost would be immense.
- **Information Sets $\{H_i\}$:** The game is one of imperfect information. Each player's information set H includes public statements, economic data, and military deployments. However, critical variables—such as the precise conditions that would trigger a third-party military intervention or C's resolve to initiate a direct conflict—remain private knowledge, creating fundamental uncertainty for both players.

Strategic Options and Payoff Analysis

Each player has a set of strategies $\{S_i\}$. C's strategy set S_c includes a cooperative option. T's strategies reflect its response to C's posture. The payoffs, $u_i(S_i, S_{-i})$, resulting from various outcomes of different strategy profiles are represented in the form of (C's payoff, T's payoff) in a matrix on a scale where higher numbers represent greater perceived benefits or better outcomes for respective players.

Player C's Strategies, S_c :

1. *Forceful Unification*: Use military and economic coercion to achieve unification.
2. *Status Quo Pressure*: Maintain military and diplomatic pressure without initiating open conflict.
3. *Deep Integration (Cooperative Strategy)*: Actively promote a broad 'open-arm' policy and governmental structure to encourage deep economic, social, and political collaboration, as a path to peaceful, negotiated unification.

Player T's Strategies, S_t :

1. *Declare Independence*: Formally declare sovereign independence.
2. *Maintain Autonomy*: Actively engage in non-military initiatives to preserve autonomy.

Payoff Matrix

The interaction can be modeled in the following payoff matrix. The introduction of C's 'Deep Integration' strategy adds a new row and changes the strategic landscape.

Outcomes (C's payoff, T's payoff)	T: Declare Independence	T: Maintain Autonomy
C: Forceful Unification	Catastrophic conflict, economic ruin, international condemnation. (-10, -10)	C achieves goal at high cost; T loses autonomy. (5, -8)
C: Status Quo Pressure	High-tension crisis, sanctions, likely conflict. (-8, -5)	Tense but stable status quo, characterized by ongoing pressure. (3, 3)
C: Deep Integration	C's policy fails, T's move is seen as betrayal, leading to crisis. (1, -2)	C gains influence and path to unification; T gains economic/social benefits while preserving autonomy. (8, 6)

Analysis of C's 'Deep Integration' Strategy

The introduction of the 'Deep Integration' strategy is a pivotal move by C designed to alter the payoff structure of the game. Its primary goal is to make cooperation the dominant strategy for T.

1. **Shifting the Equilibrium:** Without the 'Deep Integration' option, the game might settle at (Status Quo Pressure, Maintain Autonomy) with a payoff of (3, 3). This is a suboptimal and high-tension equilibrium as C may attempt a different option for a potentially higher payoff of (5, -8). However, that may cause T to act desperately resulting in a loss-loss outcome (-10, -10).

The Deep Integration strategy introduces a much more attractive outcome: (Deep Integration, Maintain Autonomy) with a payoff of (8, 6). For T, choosing 'Maintain Autonomy' now yields a potential payoff of 6 (if C integrates) versus 3 (if C pressures) or -8 (if C forces). This makes cooperation with C's Deep Integration policy the most rational choice for T, assuming T believes C's offer is credible.

2. **Dominating Other Strategies:** The (8, 6) outcome is Pareto superior to the (3, 3) status quo, meaning both players are better off and no other player worse off. This option makes C's own 'Forceful Unification' and 'Status Quo Pressure' strategies less appealing if T is willing to cooperate. It creates a strong incentive for both sides to move towards the new cooperative equilibrium.
3. **Path to Negotiation:** By making this move, C is signaling a preference for a non-confrontational resolution. This strategy aims to build trust and interdependence, changing the nature of the game to a strongly positive-sum collaboration. The ultimate hope for C is that the high payoffs from this cooperative state will eventually make formal, negotiated unification an acceptable and logical outcome for T.