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Strategic Utility Analysis of Special Operations Forces Applying Game Theory

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Abstract- As a strategic asset, special-operations forces (SOF) are trained, equipped, and organized to combat irregular threats. The employment of SOF is under heavy discussion among academics, decision makers, and the SOF community. This article addresses the following questions: 1) How do SOF achieve strategic effects as a policy tool of national strategy; and 2) In which types of roles and missions do SOF's strategic value rest? This study claims that to provide strategic utility, SOF must operate independently, or at least supported by conventional forces, executing both direct-action missions and indirect-action missions. SOF's indirect-action missions are comparatively more important than their direct-action skills. The authors applies game theory to all strategic environments, peacetime, conflict, and conventional war. Using a game-theory approach, this article presents the decrease in SOF strategic value when they are improperly employed. Military leaders and policy makers must employ SOF according to their capabilities and limitations.

Keywords- Strategic Utility, Special Operations, Special Operations Command, Department of Defence, Game Theory.

1. Introduction

Until the end of the Cold War, military leaders and decision makers believed that the strategic value of special-operations forces (SOF) was questionable. They claimed that SOF are elite units that conduct missions that conventional units cannot accomplish. During World War II and the Cold War, the dominant military doctrine was air–land battle. On the battlefield, the ambiguity, friction, and massive arrangement of combat power limited SOF's ability to conduct special operations, decreasing their strategic utility (Ohad, 2010). Since the end of the Cold War, small wars, irregular threats, and terrorism have been the main threats to the United States. The U.S. Special Operations Command (SOCOM) was established as a strategic asset to combat irregular threats (Mahla, and Riga, 2003). After the 9/11 terrorist attacks, the demand for SOF increased dramatically. As a result, SOF are the most deployed of American military forces (Eric, 2009).

In the post-9/11 era, SOF have often conducted direct-action (DA) missions in support of conventional forces (CF). In Operation Iraqi Freedom (OIF) and currently in Operation Enduring Freedom (OEF), SOF have carried out missions largely in support of general purpose forces (GPF) making their role more elite or hyper-conventional (Rothstein, 2006) than special. Pentagon leaders appreciate SOF's commando skills or direct-action missions, and their supporting role, more than their warrior-diplomat, indirect-action, and independent role (Tucker, and Lamb, 2007). Historically, many of SOCOM's senior leaders supported SOF employment with conventional military with a focus on direct-action skills. It may be argued that this type of SOF employment has limited their strategic utility and reduced their effectiveness and overall contribution to the outcome of recent campaigns and wars.

This article employs the term "strategic utility" as a measure of an operation's contribution to the outcome of a campaign or war (Gray, 1996). This contribution can originate both directly, such as the killing of an enemy leader, and indirectly, such as eliminating the conditions that allow violent, extremist organizations (VEOs) to take safe haven in uncontrolled areas (Gray, 1996). SOF are specifically organized, trained, and equipped to conduct and support special operations. They provide strategic utility, to counter conventional and unconventional threats to national security and to conduct specific missions that conventional forces cannot. The absence of a universally accepted definition of SO makes it difficult to assess SOF's strategic utility. It is unrealistic to evaluate strategic utility in a general way, since the strategic value of SOF is limited to specific types of campaigns and individual cases. Therefore, SO and SOF must be considered in relation to a war or conflict as a whole (Gray, 1996). In other words, the conditions and environments in which SOF are employed are key in assessing their strategic value. These strategic environments can vary from peace to war and be categorized as peacetime, conflict, and conventional war.

2. Basics of Game Theory

Game theory is the branch of decision theory (Myerson, 2013). Game theory is generally known as the analysis of the interaction between multiple individuals in the decision making process (Smith, 1993). It is concerned with interdependent decisions and can be defined as the study of mathematical models of conflict and cooperation between intelligent and rational decision makers, also called players (Aumann, 1994). A game involves at least two players, in which each player might be one individual or a group of individuals (Osborne, M. J. 1994, Myerson, 2013).

There are two main types of games. These are sequential and simultaneous. The players must alternate moves in sequential games, but in simultaneous games, the players can act at the same time (Friedman, 1986). It is clear to claim that these types are separated because they require different analytical approaches (Engelbrecht, 1999; Sindik and Vidak, 2008). Game theory allows problem solving using interactive optimization. Many applications especially for social sciences and decision making have been done based on game theory (Shubik, 2006; Šporčić, et al.,2011).

Some basic desicion theory axioms that effects game theory is given below. Unless otherwise stated, these axioms are to hold for all lotteries *e*, *f*, *g*, and *h* in *L*, for all events S and T in E, and for all numbers α and β between 0 and 1 (See Myerson, 2013 for more axioms).

Axiom 1 (Completeness)

$$f \gtrsim_s g \text{ or } g \gtrsim_s f \tag{1}$$

Axiom2 (Transitivity)

$$If\ f \gtrsim_s g \text{ and } g \gtrsim_s h \text{ then } f \gtrsim_s h \tag{2}$$

Axiom3 (Relevance)

$$If\ f(\cdot|t) = g(\cdot|t)\ \forall t \in S, then\ \text{f} \sim_s g \tag{3}$$

Axiom 4 (Monotonicity)

$$\begin{gathered} If\ f \succ_s h \text{ and } 0 \le \beta < \alpha \le 1, \text{ then} \\ \alpha\text{f}+(1-\alpha)h \succ_s \beta f + (1-\beta)h \end{gathered} \tag{4}$$

Axiom 5 (Continuity) $If\ f \gtrsim_s g$ and $g \gtrsim_s h$ then there exists some number γ such that

$$0 \le \gamma \le 1 \text{ and } g \sim_s \gamma f + (1-\gamma)h \tag{5}$$

Neumann (1928) proved the Minimax Theorem which marks the beginning of game theory in 1928. The Minimax Theorem states that there exists a unique equilibrium point for every 2 player simultaneous move zero-sum game (Neumann, 1928; Kakutani, 1941). That is, the Minimax Theorem guarantees the existence of exactly one equilibrium point for any 2-player zero-sum matrix game (Neumann, 1928; Loomis, 1946). However, the equilibrium point may be the result of the use of pure or mixed strategies by either one or both players.

Minimax theorem: Let $A=\left(a_{ij}\right)$ be any mxn real matrix. Then these exists a pair of probability vectors $x^*=(x_1^*,x_2^*,,,,,x_m^*)$ and $y^*=(y_1^*,y_2^*,,,,,y_n^*)$ such that for a unique constant v,

$$\sum_i a_{ij}x_i^* \geq v,\quad j \approx 1,2,...,n, \tag{6}$$

$$\sum_i a_{ij}\,y_j^* \leq v,\quad i \approx 1,2,...,m. \tag{7}$$

Equivalently if K(x,y)= $\sum_i \sum_j a_{ij}x_i y_j$ then (x^*,y^*) is a saddle point for K(x,y). That is

$$\min_y \max_x K(x,y) = \max_y \min_x K(x,y), \tag{8}$$

where min and max are taken respectively over the set of all probability vectors x for player I and probability vectors y for player II (Myerson, 2013).

3. Analysing The Strategic Utility of SOF Using Game Theory

This section seeks to identify the strategic utility of SOF by applying game theory to analyse the rational choice of strategies. Each strategic environment-peacetime, conflict, and conventional war will be analysed. First, the current relationship between SOCOM and the Department of Defence (DoD) will be discussed using a theory that will be called the "real game." Next, the game will be changed according to SOF's capabilities and limitations; this will be the "optimal game." This game depends on the hypothesis of Tucker and Lamb that "SOF's strategic value rests in their ability to counter unconventional threats both directly and indirectly and take the lead in doing so… SOF's indirect role is comparatively more important than its direct role (Tucker, and Lamb, 2007)." Finally, a comparison between the "real game" and "optimal game" is made.

Fig. 1. Diagram of the Game Process

Figure 1 illustrates the game process, which this article discusses. First the game will setup regarding the players strategies and then total conflict – zero-sum game – will analyse. In a zero sum game, one-player gains, the other player loses, where the sum of payoffs is always zero (Neumann, and Morgenstern, 1953). Second the game players will communicate and cooperate in order to increase their payoffs called partial conflict –non-zero-sum game, which the sum of payoffs is variable (COMAP, 1997). Finally, the article will examine "strategic moves" including first move, threat and promise (Schelling, 1981). To gain strategic advantage players commit a strategic move.

3.1. Current Situation: The Real Game in Conventional War

To set up a game, it is vital to understand its rules and assumptions. The assumptions are that the game is a partial-conflict game, both players are rational, and both players are attempting to maximize their individual payoffs. In both the real and optimal games, the players have two strategies. SOCOM would prefer to deploy SOF either using their direct-action or indirect-action skills; and DoD would prefer to deploy SOF in support of GPF or in their independent role. These two alternatives for each player leads to four possible strategic options. The setup of the game requires a rank order for SOCOM and DoD, as demonstrated in Tables 1 and 2. In the current situation, SOCOM puts greater emphasis on SOF's direct-action skills, and its rank order is the same for all strategic environments. DoD tends to favour SOF's supporting role and direct-action skills.

Table 1. SOCOM's Strategic Options for the Real Game in Conventional War.

4. Best Choice–DoD/independent; SOCOM/direct
3. Next-Best–DoD/supporting; SOCOM/direct
2. Least Best–DoD/independent; SOCOM/indirect
1. Worst–DoD/supporting; SOCOM/indirect

Table 2. DoD's Strategic Options for the Real Game in Conventional War.

4. Best Choice–DoD/supporting; SOCOM/direct
3. Next-Best–DoD/ independent; SOCOM/indirect
2. Least Best–DoD/supporting; SOCOM/direct
1. Worst–DoD/independent; SOCOM/indirect

After establishing the rank order listed above in tables 1 and 2, a payoff matrix can illustrate the game with row player values listed first.

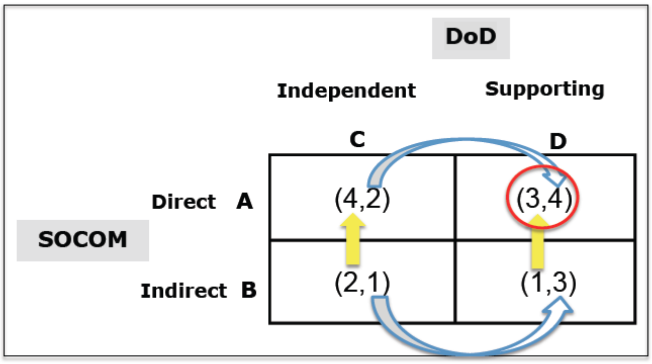

Fig. 2. The Real Game of SOCOM and DoD in Conventional War.

Figure 2 illustrates the strategic utility relationship between SOCOM and DoD. The arrows, yellow for SOCOM, blue for DoD, show the direction each side would shift based on the other side`s policy. Both SOCOM and DoD have a dominant strategy. SOCOM always chooses the direct-action missions and DoD prefers to deploy SOF in support of GPF in conventional war. As a result of these dominant strategies, the Nash equilibrium, the point at which no player can benefit by departing unilaterally (COMAP, 1997), occurs at AD (3,4). At Nash equilibrium, neither SOCOM nor DoD can benefit by departing unilaterally from its position. Furthermore, the outcome AD (3,4) means that DoD deploys SOF in support of GPF and SOF carries out the direct action missions. In addition, while DoD would achieve its best option, SOCOM would get its next best option. Therefore, SOCOM would try to maximize its outcome of payoffs. Up to this point, we have examined non-zero sum game – players do not communicate each other while choosing their strategies (Straffin, 2002). From this point, the game will open the communication to determine the "strategic moves" —an analysis exploring all possible options for each player individually (Kraag, and Larssen, 2010). With "strategic moves", we would consider each player's commitments, threats and promises (Schelling, 1981). By this means, we would determine if SOCOM could change the outcome of the game by communicating with DoD.

Strategic Moves;

<u>SOCOM moves first</u>

- If SOCOM does A, then DoD does D, which results in outcome AD (3,4)
- If SOCOM does B, then DoD does D, which results in outcome BD (1,3)

So, SOCOM would choose the outcome AD (3,4), which is a better option from its perspective.

<u>SOCOM forces DoD moves first</u>

- If DoD does C, then SOCOM does A, which results in outcome AC (4,2)
- If DoD does D, then SOCOM does A, which results in outcome AD (3,4)

So, DoD would choose outcome AD (3,4), which is a better option from its perspective.

<u>SOCOM issues a threat to DoD</u>

SOCOM wants DoD to choose strategy C. For a credible threat, it must hurt both players.

Threat;

- If DoD does D, then SOCOM does B, which results in BD (1,3)

Normally;

- If DoD does D, then SOCOM does A, which results in AD (3,4)

This is a credible threat and eliminates outcome AD (3,4), because it hurts both SOCOM and DoD. However, it will not work, since DoD would still choose option D. Therefore, SOCOM cannot get DoD to choose strategy C with a threat.

<u>SOCOM issues a promise to DoD</u>

SOCOM wants DoD to choose strategy C. For a credible promise it must hurt SOCOM and help DoD.

Promise;

- If DoD does C, then SOCOM does B, which results in BC (2,1)

Normally,

- If DoD does C, then SOCOM does A, which results in AC (4,2)

This is not a credible promise and does not eliminate outcome AC (4,2), because it hurts SOCOM but it does not help DoD. Therefore, SOCOM cannot get DoD to choose option C with a promise.

As a result of "strategic moves" in the conventional war, SOCOM cannot improve its payoff from the Nash equilibrium. On the other hand, DoD can still execute its preferred policy and achieve its best option. We have determined that SOCOM cannot benefit by unilaterally departing from its conservative strategy and cannot use threats or promises to influence DoD. In other words, SOCOM does not have a "strategic move" against DoD. That means SOF are employed to support conventional forces and carry out direct missions today.

3.2. The Real Game in Conflict

As mentioned earlier, strategic options for SOCOM are the same for all strategic environments. For this reason, only DoD's options are ranked in Table 3. In conflict, DoD still wants to use SOF in conjunction with CF, but DoD prefers SOF's indirect-action skills.

Table 3. DoD's Strategic Options for Real Game in Conflict.

4. Best Choice–DoD/supporting; SOCOM/indirect
3. Next-Best–DoD/supporting; SOCOM/direct
2. Least Best–DoD/independent; SOCOM/indirect
1. Worst–DoD/independent; SOCOM/direct

With the rank order in Table 3, the real game is shown in Figure 2.

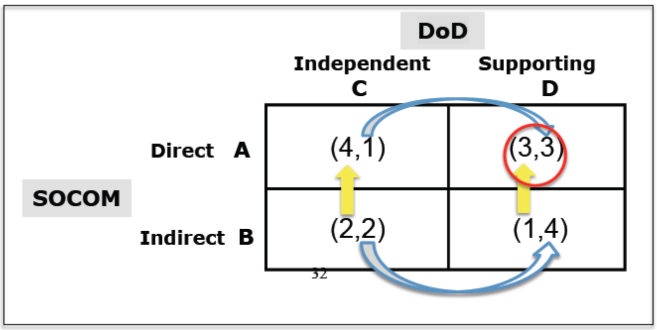

Fig.3. The Real Game of SOCOM and DoD in Conflict.

As seen in Fig.3., both SOCOM and DoD have a dominant strategy and still SOCOM chooses direct-action missions and DoD prefers to deploy SOF in support of GPF in a conflict. As a result of these dominant strategies, Nash Equilibrium occurs at AD (3,3). The outcome AD (3,3) means that DoD deploys SOF in support of GPF and SOF carry out direct missions like the real game in conventional war. However, in conflict, DoD would achieve its next-best option. Also, SOCOM would get its next-best option without communication. Both players would try to maximize their strategy.

Strategic Moves;

<u>SOCOM moves first</u>

- If SOCOM does A, then DoD does D, which results in outcome AD (3,3)
- If SOCOM does B, then DoD does D, which results in outcome BD (1,4)

So, SOCOM would choose the outcome AD (3,3), because it is a better option than BD (1,4) from its point of view.

<u>SOCOM forces DoD moves first</u>

- If DoD does C, then SOCOM does A, which results in outcome AC (4,1)
- If DoD does D, then SOCOM does A, which results in outcome AD (3,3)

So, DoD would choose the outcome AD (3,3), because it is a better option from its perspective. Both SOCOM moving first and forcing DoD to move first would results in outcome AD (3,3)

<u>SOCOM issues a threat to DoD</u>

SOCOM wants DoD to choose strategy C.

Threat;

- If DoD does D, then SOCOM does B, which results in BD (1,4)

Normally;

- If DoD does D, then SOCOM does A, which results in AD (3,3)

This is not a threat and does not eliminate outcome AD (3,3), since it hurts SOCOM, but helps DoD.

<u>SOCOM issues a promise to DoD</u>

SOCOM wants DoD to choose strategy C.

Promise;

- If DoD does C, then SOCOM does B, which results in BC (2,2)

Normally,

- If DoD does C, then SOCOM does A, which results in AC (4,1)

This is a credible promise and eliminates outcome AC (4,1), because it hurts SOCOM, but helps DoD. However, it will not work, since DoD can still get a better outcome with strategy C with a promise.

As a result, SOCOM cannot improve its payoff from the Nash Equilibrium. On the other hand, DoD can still carry out its preferred strategy (D) and achieve its next-best option. Like the real game in conventional war, SOCOM has no viable strategic moves and cannot benefit by unilaterally departing from its conservative strategy. The only difference from the conventional war game is DoD gets its next-best option instead of the best option with its conservative strategy. Therefore, SOF routinely are deployed to support conventional forces and perform direct action missions.

3.3. The Real Game in Peacetime

Given the DoD's strategic options, there are some changes in the rank order list, as show in Table 4. In peacetime, DoD wants to use SOF as a leading force and better accepts their indirect-action skills.

Table 4. DoD's Strategic Options for Real Game in Peacetime.

4.Best Choice DoD/independent; SOCOM/indirect
3. Next-Best–DoD/independent; SOCOM/direct
2. Least Best–DoD/supporting; SOCOM/indirect
1. Worst–DoD/independent; SOCOM/direct

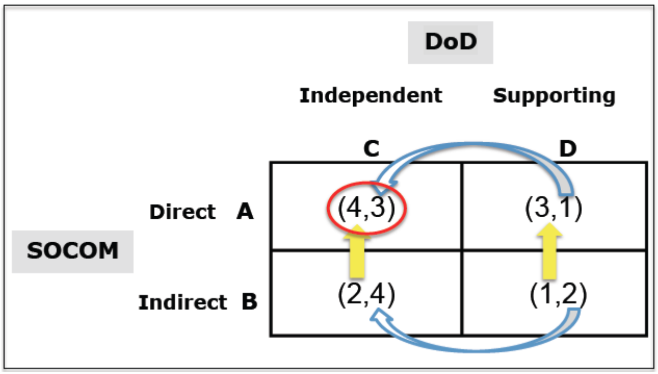

Fig. 4. The Real Game of SOCOM and DoD in Peacetime.

Both players have a dominant strategy as well (Fig.4). SOCOM chooses the direct-action missions and DoD prefers to deploy SOF as a leading force in peacetime. As a result of these dominant strategies, Nash Equilibrium occurs at AC (4,3). The outcome AC (4,3) means that DoD deploys SOF independently and SOF carry out the direct action missions. While SOCOM achieves its best option, DoD gets its next-best option without communication.

Strategic Moves;

<u>SOCOM moves first</u>

- If SOCOM does A, then DoD does C, which results in outcome AC (4,3)

- If SOCOM does B, then DoD does C, which results in outcome BC (2,4)

So, SOCOM would choose the outcome AC (4,3), which is its best option from its perspective.

SOCOM forces DoD to move first

- If DoD does C, then SOCOM does A, which results in outcome AC (4,3)
- If DoD does D, then SOCOM does A, which results in outcome AD (3,1)

Thus, DoD would choose the outcome AC (4,3), which is its better option.

SOCOM issues a threat to DoD

SOCOM wants DoD to choose strategy C.

Threat;

- If DoD does D, then SOCOM does B, which results in BD (1,2)

Normally;

- If DoD does D, then SOCOM does A, which results in AD (3,1)

This is not a threat and does not eliminate outcome AD (3,1), because it hurts SOCOM, but it helps DoD.

SOCOM issues a promise to DoD

SOCOM wants DoD to choose strategy C.

Promise;

- If DoD does C, then SOCOM does B, which results in BC (2,4)

Normally,

- If DoD does C, then SOCOM does A, which results in AC (4,3)

This is a credible promise and does eliminate outcome AC (4,3), because it hurts SOCOM while it helps DoD. At the same time, it will work, since DoD cannot increase its utility with strategy D. Hence, SOCOM can push DoD to choose C with a promise. However, SOCOM would get a 2, which is its least best option.

As a result, the only strategic move that SOCOM has is the first move. Thus, SOCOM can improve its payoff with a first move.

3.4. Changing The Game: The Optimal Game

In the previous game, the article discussed the current situation between SOCOM and DoD in terms of SOF's strategic value. The real-game argument was due to the same reasons that SOCOM leadership does not act according to SOF's capabilities and limitations. This deficiency leads to an ineffective use of SOF, which provides less strategic utility in national-security strategy outcomes. By contrast, in the optimal game, the assumption is that if SOCOM acts to maximize SOF skills and minimize limitations, it would result in greater strategic contribution in the outcomes of national policy. Furthermore, the optimal game is established according to the hypothesis of Lamb and Tucker, as mentioned earlier.

3.5. The Optimal Game in Conventional War

In the optimal game, while DoD would still have the same preferences, SOCOM's new preferences list is shown in Table 5.

Table 5. SOCOM's Strategic Options for the Optimal Game.

4.Best Choice DoD/independent; SOCOM/indirect
3. Next-Best–DoD/independent; SOCOM/direct
2. Least Best–DoD/supporting; SOCOM/indirect
1. Worst–DoD/supporting; SOCOM/direct

Table 6. DoD's Strategic Options for the Optimal Game in Conventional War.

4. Best Choice–DoD/supporting; SOCOM/direct
3. Next-Best–DoD/supporting; SOCOM/indirect
2. Least Best–DoD/independent; SOCOM/direct
1. Worst–DoD/independent; SOCOM/indirect

This new preferences list of SOCOM results in a different payoff matrix, shown in Table 6.

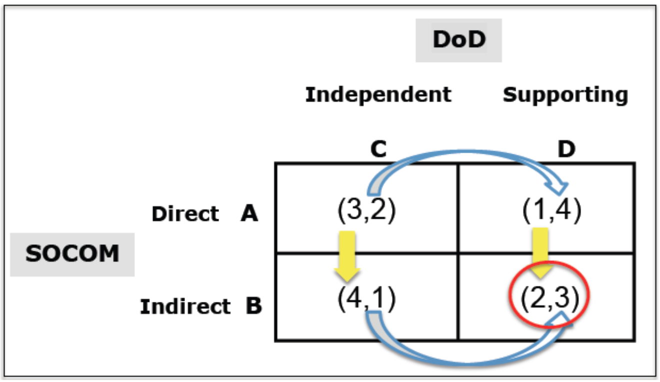

Fig. 5. The Optimal Game of SOCOM and DoD in Conventional War.

Both players still have a dominant strategy that SOCOM chooses the indirect-action missions and DoD prefers SOF's supporting role (Fig.5). The Nash Equilibrium now results in outcome BD (2,3) SOF's supporting role and indirect-action skills. While SOCOM achieves its least-best option, DoD gets its next-best option without communication. Both SOCOM and DoD would communicate with each other to improve their strategy.

Strategic Moves;

SOCOM moves first

- If SOCOM does A, then DoD does D, which results in outcome AD (1, 4)
- If SOCOM does B, then DoD does D, which results in outcome BD (2, 3)

So, SOCOM would choose outcome BD (2, 3), which is the better option from its perspective.

SOCOM forces DoD to move first

- If DoD does C, then SOCOM does B, which results in outcome BC (4, 1)
- If DoD does D, then SOCOM does B, which results in outcome BD (2, 3)

So, DoD would choose outcome BD (2, 3), which is the better option from its perspective.

Both SOCOM's moving first and forcing DoD to move first would result in outcome BD (2, 3). By moving first and forcing DoD to move first, SOCOM wouldn't achieve any better outcome other than the likely outcome without communication.

SOCOM issues a threat to DoD

SOCOM wants DoD to choose strategy C.
Threat;

- If DoD does D, then SOCOM does A, which results in AD (1,4)

Normally;

- If DoD does D, then SOCOM does B, which results in BD (2,3)

This is not a threat and does not eliminate outcome BD (2,3), since it hurts SOCOM, but helps DoD. Therefore, SOCOM cannot get DoD to choose strategy C with a threat.

SOCOM issues a promise to DoD

SOCOM wants DoD to choose strategy C.
Promise;

- If DoD does C, then SOCOM does A, which results in AC (3,2)

Normally,

- If DoD does C, then SOCOM does B, which results in BC (4,1)

It is a credible promise and eliminates outcome BC (4,1), since it hurts SOCOM and helps DoD. However, it will not work, because DoD can still get a better option with D. Therefore, SOCOM cannot get DoD to choose option C with a promise.

In the optimal game in conventional war, with the strategic moves, SOCOM cannot achieve a better outcome other than its least best outcome, since it has no viable strategic moves. On the other hand, DoD would still carry out its preferred strategy D and get its next best option. Therefore, the game results in DoD's preference for SOF's supporting role and SOCOM choosing indirect-action missions.

3.6. The Optimal Game in Conflict

Table 7. DoD's Strategic Options for the Optimal Game in Conflict.

4. Best Choice–DoD/supporting; SOCOM/indirect
3. Next-Best–DoD/supporting; SOCOM/direct
2. Least Best–DoD/independent; SOCOM/indirect
1. Worst–DoD/independent; SOCOM/direct

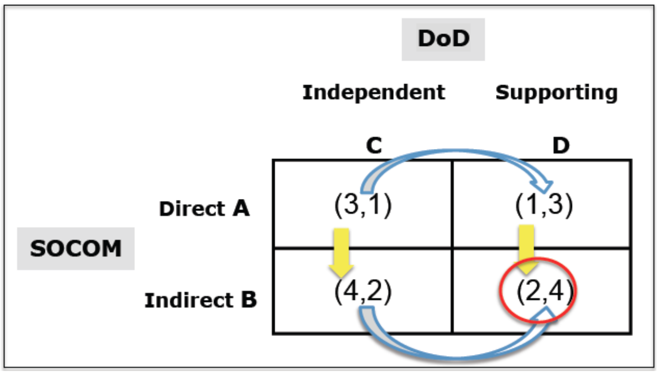

Fig.6. The Optimal Game of SOCOM and DoD in Conflict.

This game is very similar to the optimal game in conventional war (Table 7). Both players have a dominant strategy in which SOCOM chooses indirect-action missions and DoD prefers SOF's supporting role (Fig.6). In addition, the Nash Equilibrium results in outcome BD (2,4) too-SOF's supporting role and indirect-action skills. The only difference is that DoD receives its best option rather than the next-best option without communication. Therefore, SOCOM would communicate to improve its strategy.

Strategic Moves;

<u>SOCOM moves first</u>

- If SOCOM does A, then DoD does D, which results in outcome AD (1,3)
- If SOCOM does B, then DoD does D, which results in outcome BD (2,4)

So, SOCOM would choose outcome BD (2,4), which is a better option from its perspective.

<u>SOCOM forces DoD moves first</u>

- If DoD does C, then SOCOM does B, which results in outcome BC (4,2)
- If DoD does D, then SOCOM does B, which results in outcome BD (2,4)

So, DoD would choose the outcome BD (2,4), which is a better option from its perspective.

Both SOCOM's moving first and forcing DoD to move first would result in outcome BD (2, 4).

<u>SOCOM issues a threat to DoD</u>

SOCOM wants DoD to choose strategy C.

Threat;

- If DoD does D, then SOCOM does A, which results in AD (1,3)

Normally;

- If DoD does D, then SOCOM does B, which results in BD (2,4)

This is a credible threat and eliminates outcome BD (2,4), since it hurts both SOCOM and DoD. However, it will not work because DoD can still get a better option with option D. Therefore, SOCOM cannot get DoD to choose strategy C with a threat.

<u>SOCOM issues a promise to DoD</u>

SOCOM wants DoD to choose strategy C.

Promise;

- If DoD does C, then SOCOM does A, which results in AC (3,1)

Normally,

- If DoD does C, then SOCOM does B, which results in BC (4,2)

It is not a promise and does not eliminate outcome BC (4,2), because it hurts SOCOM, but does not help DoD. Therefore, SOCOM cannot get DoD to choose option C with a promise.

In the optimal game in conflict, SOCOM has no viable strategic moves. With the strategic moves, SOCOM would get only its least-best outcome, and DoD would carry out its preferred strategy D achieving its best outcome or at least its next-best outcome.

2.7. The Optimal Game in Peacetime

Table 8. DoD's Strategic Options for the Optimal Game in Conflict.

4.Best Choice DoD/independent; SOCOM/indirect
3. Next-Best–DoD/independent; SOCOM/direct
2. Least Best–DoD/supporting; SOCOM/indirect
1. Worst–DoD/supporting; SOCOM/direct

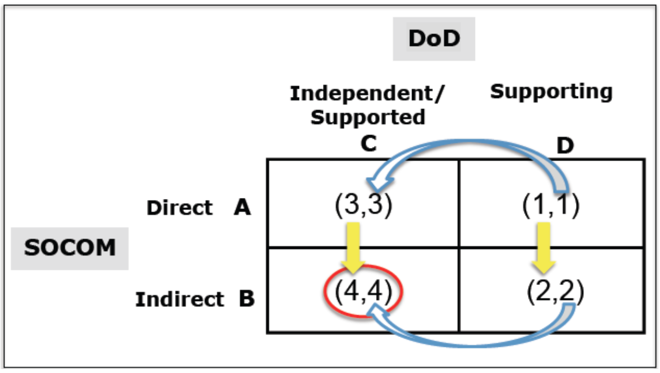

Fig. 7. The Optimal Game of SOCOM and DoD in Peacetime.

Given DoD's options in Table 8, Figure 7 illustrates that both SOCOM and DoD have a dominant strategy. SOCOM always chooses to perform indirectly and DoD prefers to deploy SOF independently in peacetime. The Nash equilibrium emerges at BC (4,4)—both players receive their best option. The outcome BC means that DoD deploys SOF independently and SOCOM carries out the indirect action missions. It is obvious that the game would end up with the best payoff for both players. Therefore, there is no need to execute strategic moves for each side.

4. Results and Discussion

The comparison of these two games illustrates changes in SOF's strategic utility according to SOCOM leadership decisions. It is important to discuss the results of games (Table 9) to deploy SOF optimally. The results of games will be discussed for all three strategic environments.

Table 9. Likely Outcomes Of SOCOM

Likely Outcomes Of SOCOM						
Environment	Conventional War		Conflict		Peacetime	
Game	Real	Optimal	Real	Optimal	Real	Optimal
4 Independent/ Indirect						**4**
3 Independent/ Direct					**3**	
2 Supporting/ Indirect		**2**		**2**		
1 Supporting/ Direct	**1**		**1**			

First, in conventional war, while the real game results in using SOF in support of conventional forces with their direct-action skills, the optimal game results in using SOF in support of conventional forces with their indirect-action skills. Given SOF's strategic-utility preferences, SOF receives a 1 in the real game and a 2 in the optimal game. In other words, SOF's strategic value decreases when SOCOM leadership does not act to enhance SOF's strategic impact. Also, neither in the real game nor in the optimal game can SOCOM improve SOF's strategic utility, since it has no viable strategic moves.

Second, in conflict, both side's payoff values differed from those in conventional war, but both games resulted in the same outcome as in conventional war. Thus, SOF receives a 1 in the real game and a 2 in the optimal game. Therefore, the same conclusions would be predicted for SOF's strategic value.

Finally, in peacetime, while the real game results in deploying SOF independently using their direct-action skills, the optimal game results in using SOF independently using their indirect-action skills. Although the role of SOF is the same in both games, their missions change from direct to indirect. Given SOF's strategic-utility rank order,

SOF receives a 3 in the real game and a 4 in the optimal game. In other words, SOF's strategic value still decreases when SOCOM leadership does not make decisions to optimize SOF's capabilities and limitations.

5. Conclusions

"When the hour of crisis comes, remember that forty selected men can shake the world (Neillands, 1997)."

Yasotay (Mongol warlord)

In the 1990s, the employment of SOF was not being argued extensively because threats to the U.S were regular and SOF conducted largely direct-action missions in support of conventional forces making their role more elite or hyper-conventional than special. With the 9/11 terrorist attacks, small wars, irregular threats, and terrorism have been the main threats to the U.S.

This new security environment has increased the demand for SOF, and they are among the most deployed U.S. forces (Eric, 2009). However, the way of employing SOF has not changed; they are still largely deployed in a support of GPF with their direct-action skills.

Pentagon leaders appreciate SOF's commando skills, direct-action missions and supporting role more than their warrior-diplomat skills, indirect-action missions and independent role (Tucker, and Lamb, 2007). Moreover, SOCOM's senior leaders seem to agree with conventional military leaders that SOF should be deployed mostly in conjunction with GPF, using their direct-action skills. This type of employment of SOF has arguably limited their strategic utility and reduced their effectiveness and overall contribution to the outcome of campaigns and wars. SOF's strategic value decreases when SOCOM leadership does not act according SOF capabilities and limitations, as demonstrated above. SOCOM should review the strengths and weaknesses of each of its subordinate commands and pay more attention to SOF's attributes to provide the most efficient use of limited resources (Eric, 2009).

Assessment of SOF's role and missions depends on the nature of the current threat, the security environment, the national-security strategy, and the nature of the forces themselves. SOF provide decision makers with increased options for achieving national-security strategy objectives, but political leaders and strategists must understand the capabilities and limitations of these forces. In addition, a lack of understanding of the proper employment of SOF, and more specifically of how to achieve its optimal strategic utility, continues. To achieve optimal strategic utility requires a common understanding of SO among policy makers and military leaders. Also, the strategic value of SOF across the continuum from peace to war can vary significantly.

Institutional constraints, leadership shortfalls, and a lack of understanding of SOF capabilities have lead to the misuse of SOF as a strategic asset for combating irregular threats in complex and unstable environments (Mahla, and Riga, 2003).SOF must primarily operate independently or as the supported organization to counter unconventional threats both directly and indirectly (Tucker, and Lamb, 2007). This arrangement will unleash the strategic potential of SO. Furthermore, the indirect role operating by, with and through an indigenous population would better serve the DoD and SOCOM.

Game theory is a way of decision making approach and it can aid decision makers at all levels in formulating strategies. In this study it is shown how game theory can be used in varying degrees to predict or explain the outcome of a strategy application for SOCOM and DoD. Authors have also used some examples to illustrate the proposed strategy in this study.

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