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Niall Ferguson's Political Economy Approach to Prisoner Taking and Prisoner Killing: a Critical Comment

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Abstract

Niall Ferguson argued that, in part, the Second World War proved much more difficult to end than the First World War because both the German and Japanese armed forces continued fighting long after any realistic prospect of victory had disappeared. He ascribes this difference to the comparatively greater difficulties faced by soldiers wishing to surrender in the Second World War. Only after the Allied military authorities had adopted policies encouraging surrender in the Second World War did large numbers of enemy troops voluntarily surrender thereby bringing the conflict to a swift conclusion. Ferguson contends that the game theoretic approach developed in economics, as exemplified in the Prisoner's Dilemma game, can be extended to a 'Captor's Dilemma' game that can shed light on the efficacy of various strategies on surrender policy available to military forces. This paper considers the game theoretic approach advanced by Ferguson and suggests that it requires further refinement before it can satisfactorily explain the problem of surrender.

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INTRODUCTION

In a path-breaking paper published in *War in History*, Niall Ferguson advanced the hypothesis that a significant reason for the longevity of the Second World War, which continued long after any realistic possibility of victory for the Axis powers, lay in the obstacles to surrender experienced by combatants on both sides of the conflict (Ferguson 2004). By contrast, the First World War was brought to a comparatively rapid end precisely because soldiers fighting for the Central Powers felt much more able to surrender and to survive the surrender process intact. In World War II, Ferguson argues that 'only when the Allied authorities adopted techniques of psychological warfare designed to encourage rather than discourage surrender did German and Japanese resistance end' (Ferguson 2004: 149).

In an effort to explain the underlying behavioral dynamics involved in the process of surrender, Ferguson invokes the game theoretic approach employed in economics which is based on rational individual calculation of self-interest. Following this methodology, individual combatants evaluate their prospects of both surviving capture intact and successfully enduring captivity. Thus, individual troops will surrender in greater numbers if they compute that their perceived chances of survival are sufficiently high as to warrant surrender. Conversely, if it is believed that efforts to surrender will be met with death or at least severe disablement, either by the enemy or one's own side, then rates of surrender will be lower, other things remaining constant. Moreover, since the incentives confronting different actors in warfare differ, rational individual behavior can take different forms depending on whether the actor is a single combat soldier or a commander of large forces of soldiers. This latter observation can explain why, for example, 'live-and-let-live' behavior was often commonplace in trench warfare in the First World War, despite simultaneously being actively and sometimes violently discouraged by high commands on both sides on the Western Front (Ashworth 1980).

In addition, Ferguson proposes an adaptation of the 'Prisoner's Dilemma game', a standard tool of economic analysis, to develop a 'Captor's Dilemma game' to encapsulate the mental calculus of a soldier contemplating whether to accept the surrender of an enemy combatant or to simply slay the foe. In a nutshell, the Captor's Dilemma resides in whether 'to accept the surrender, with all the personal risks entailed; or to shoot the surrenderer, with the likelihood that resistance may be stiffened, thus increasing the risks to one's side as a whole' (Ferguson 2004: 154).

This paper takes up the challenge to social scientists interested in the application of rational choice techniques to the historical questions presented by Ferguson's argument. While we regard the 'political economy' approach outlined by Ferguson as potentially fruitful, we attempt to provide a critical appraisal of Ferguson's attempt to place the problem of military surrender in World War II within a game theoretic framework and we suggest various caveats and qualifications.

The paper is divided into five main parts. Section 2 contains a critical evaluation of the major 'stylized facts' employed by Ferguson in his central argument on the nature and importance of surrender as an explanation for the divergent patterns observed in the First World War and the Second World War. Section 3 provides a synoptic description of the application of the game theoretic approach to economic and social issues, including warfare, using the analytical framework developed by Robert Axelrod (1985). Section 4 considers the 'Captor's Dilemma' model proposed by Ferguson and seeks to qualify and refine his general approach by drawing on game theory and the related problems of the 'tragedy of the commons' and collective action. It also outlines the characteristics that any model of prisoner taking and killing would require, and then offers some potentially refutable hypotheses under these modeling assumptions. The paper ends with some brief concluding remarks in section 5.

PLAUSIBILITY OF STYLIZED FACTS IN THE FERGUSON THESIS

A crucial foundation for the Ferguson thesis resides in the proposition that, while the First World War came to a comparatively rapid end once the Allied offensive in Western Europe in the latter half of 1918 had removed any prospect that Germany might achieve victory, by contrast no analogous capitulation occurred in the Second World War in either Europe or the Pacific, even though neither Nazi Germany nor Imperial Japan enjoyed any hope of success. Put differently, pivotal events equivalent to the triumphant Allied victories after the defeat of the German offensive on the Western Front in March 1918, such as the Axis defeat at El Alamein and in Tunisia, the German capitulation at Stalingrad, the disastrous Battle of Midway, the successful landings and rapid breakthrough in Normandy in 1944, or the destructive course of the air bombardment of Nazi Germany over the final two years of the war, did not have the same decisive effect on the desire of the German and Japanese forces to wage war.

In general, this proposition rests on strong empirical grounds and seems to us a plausible stylized description of the divergent patterns evident in the two world wars. However, the proposition should be qualified in two respects. Indeed, Ferguson himself seems to recognize the need for at least one caveat by observing that his thesis applied most strongly to 'two key theatres of the war' – the Eastern Front and operations in the Pacific – but does not adequately address the extent to which this diminishes the overall thrust of his hypothesis (Ferguson 2004: 149). For instance, large-scale episodes of surrender on both sides did occur in various theatres of the Second World War, long before either the cessation of hostilities or the introduction of techniques designed to facilitate the surrender of opposing armies. For instance, Italian soldiers surrendered in droves in Abyssinia to the invading British and South African forces and much the same is true of the Axis forces, including hundreds of thousands of German troops, in the aftermath of El Alamein, especially in Tunisia, as well as in the breakout following the initial

Allied invasion of France. Similarly, a demoralized French Army surrendered *en masse* after the blitzkrieg onslaught of the German invaders in France and Belgium in 1940. Moreover, significant numbers of Allied soldiers surrendered in Crete, at Tobruk, and after the fall of Singapore, as well as in the Philippines.

These and other examples of the surrender of very large numbers of combatants, including German forces, oblige us to modify Ferguson's stylized description and narrow it to specific theatres of World War II characterized by pronounced ideological and racial overtones that engendered the fighting with very high degree of savagery on all sides. These theatres involved roughly all Japanese land and naval action against all opponents, including American forces across the Pacific, British Imperial troops in Burma, Malaya and Singapore, the Australian Army in New Guinea and virtually all engagements in the long-running war on mainland China (see, for instance, Dower 1986). In addition, they embraced most fighting in Eastern Europe, notably between German and Russian forces, but also between the Soviet military and other Axis partners, such as Italy, Hungary and Rumania. Thus the Ferguson hypothesis should be applied to these theatres rather than all armed conflict in World War II in which German and Japanese forces were engaged. It cannot thus act as a general theory for the behavior of German and Japanese soldiers, since Germans surrendered in large numbers to the western Allies, in the face of draconian punishment and incessant propaganda from their own side, and both German and Japanese forces accepted the surrender of Allied forces *en masse*. Finally, in the Pacific theatre, even concerted efforts by the American forces to induce the surrender of Japanese soldiers met with scant success until the Emperor's ultimate radio announcement accepting the inevitable defeat of Japan (see, for example, Cook and Cook 1992: 264-265). In other words, the Ferguson thesis applies in full only to the Eastern Front.

A second reasonable objection might be raised. In particular, the greatly enhanced battlefield tactics employed by the Allies on the Western Front in 1918, as described by Gary Sheffield and other 'revisionist' historians of World War I

(see, for example, Sheffield 2001), and perhaps best exemplified in the close integration of armor, air power, artillery and infantry achieved by the Australian General Monash, may have had no equivalent in World War II until the unleashing of the atomic bomb (Perry 2004). Furthermore, awareness of the desperateness of the military plight of Nazi Germany and Imperial Japan on the part of active combatants and civilians alike may have been less acute than in the First World War, in part due to the more sophisticated propaganda techniques used and their greater ability to reach both the civil and military populations through radio transmissions, and in part attributable to the ideological nature of the conflict and the widespread belief that defeat meant literal annihilation for Nazi Germany and Imperial Japan.

GAME THEORY AND MILITARY EXPLANATION

Game theory is best described as a branch of applied mathematics that deals with structured situations or 'games' in which conscious actors or 'players' embark on different strategies in order to maximize their returns in terms of specified outcomes or 'payoffs'[1]. It first emerged as a tool of economic analysis with the pioneering work of von Neumann and Morgenstern and has subsequently become an important mode of explanation in several allied social disciplines (Von Neumann and Morgenstern 1944). Perhaps the best-known application of game theory to military history is Robert Axelrod's analysis of the intriguing 'live-and-let-live' system that seems to have existed at various points on the Western Front in the First World War (Axelrod 1985). In his explanation for this phenomenon, Axelrod used a particular type of game known as the 'Prisoner's Dilemma'.

In essence, in terms of Axelrod's explanation for 'live-and-let-live' system, the Prisoner's Dilemma Game comprises two opposing military units or 'players'

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[1] see, for example, Dixit (2006), for a good summary of both the development and significance of game theory in economic analysis.

facing each other for extended periods of time across a system of trenches. Each player has two basic choices in the 'game': To 'cooperate' tacitly by taking no lethal action against the other player; or to 'defect' by taking lethal action. Each player must make this decision without knowing how the other player will react. Defection yields a higher payoff than cooperation in the short run for both players and thus both face a strong incentive to defect. Axelrod described the incentives to defect under these circumstances as follows: 'For both sides, weakening the enemy is an important value because it will promote survival if a major battle is ordered in the sector' and thus 'in the short run it is better do damage now whether the enemy is shooting back or not'. Accordingly, 'mutual defection is preferred to unilateral constraint'. However, if both players defect then the dilemma resides in the fact that both will emerge worse off than if they both cooperated since 'both sides prefer mutual restraint to the random alternation of serious hostilities' (Axelrod 1985: 75). In other words, while short-run incentives exist for both sides to engage in lethal action, over the longer run the certainty of 'tit-for-tat' behavior by opposing forces means that cooperation will emerge as the dominant strategy by both sides. The 'live-and-let-live' system in trench warfare thus exemplifies a classic Prisoner's Dilemma game since in its iterated (or repeated) game form it can lead to the evolution of cooperative behavior, despite individual imperatives to engage in hostilities. As we argue below, the importance of the presence of repeated interaction among the same units (or the lack thereof) may, in part, explain different patterns of surrender across not only time (i.e. WWI versus WWII) but also across different theatres in the same war.

Simple Prisoner's Dilemma Games of this kind are typically illustrated by means of a payoff matrix shown in Figure 1.

	Cooperate	*Defect*
Cooperate	R=3, R=3 Reward for mutual cooperation	S=0, T=5 Sucker's payoff, and temptation to defect
Defect	T=5, S=0 Temptation to defect and sucker's payoff	P=1, P=1 Punishment for mutual defection

Row Player

Figure 1: Prisoner's Dilemma

Source: Axelrod 1985: 75.
Note: The payoffs to the row chooser are listed first.

Figure 1 illustrates that defined relationships must hold in the four possibilities contained in it, each assigned an absolute number for simplicity. The best outcome for either side is T (the temptation to defect while the other side cooperates), whereas the worst outcome is S (where one side cooperates and the opposing side continually defects). On the other hand, R (where both sides cooperate) yields a better mutual outcome than P (the case where both sides defect). Any Prisoner's Dilemma game must thus satisfy the condition that T>R>P>S (or 5>3>1>0), as shown in Figure 1.

For a Prisoner's Dilemma game of the type illustrated in Figure 1 to occur, various conditions must be met. Firstly, each side must be able to recognize the pattern of interaction between them and take this into account in considering its own strategy. In a repeated game scenario, the game illustrated in Figure 1 depicting the decision of whether or not to cooperate or defect occurs again and again in successive periods among the same two players. However, there is no way to either eliminate the opposing side or to change the payoff matrix confronting the other side. Put differently, no strategy exists for changing the structure of the game.

By contrast, in a 'single-shot' game players meet and decide their respective courses of action and never meet (or play) again. The outcome of this type of game, with both analytical solution methods, such as the equilibrium concept developed by John Nash, and in actual practice, tends to result in a 'defect, defect' outcome (i.e. the worst aggregate outcome for both players/prisoners)[2]. In repeated games, where the game illustrated in Figure 1 is played again and again - for example, every evening at sunset in opposing trenches - typically a 'cooperate, cooperate' outcome may occur. Often this is the result of the 'tit-for-tat' phenomenon of lethal action being met with reciprocal lethal action. Put differently, a 'defection' in round one will be met by the opposing player punishing the initiating player with their own 'defect' decision in round two, and so on. Axelrod has described the essence of the Prisoner's Dilemma game under these circumstances as follows: 'Under these conditions words not backed by actions are so cheap as to be meaningless' since 'the players can only communicate with each other through the sequence of their own behavior' (Axelrod 1985: 12).

'CAPTOR'S DILEMMA' MODEL TO ACCEPT SURRENDER

The structure of a repeated Prisoner's Dilemma game used by Axelrod in his analysis of the 'live-and-let-live' system in trench warfare forms the implicit background to Ferguson's 'Captor's Dilemma' model of the decision by a captor to accept the surrender of an enemy combatant. In his construction of the options confronting the individual warrior prior to battle, Ferguson identified five main possibilities: To fight; to desert; to mutiny; to mutilate oneself; or to surrender. From the perspective of the soldier evaluating these potential courses of action, Ferguson contends that the decision to surrender will involve considering the

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[2] For technical definitions of game-theoretic concepts, see Fudenberg and Tirole (1993). For a summary of the seminal experiment of a repeated Prisoner's Dilemma in which the 'defect, defect' outcome was found, see Axelrod and Hamilton (1981).

likely costs and benefits of six factors. Firstly, the individual will assess the probability of being killed (or at least seriously injured) if he decides to fight. Secondly, the likelihood of being executed by one's own forces should an attempt be made to surrender. Thirdly, the probability of being killed by the enemy should he seek to surrender. Fourthly, any perceived differences in the 'recent quality of life' of continued combat relative to 'the anticipated quality of life' as a prisoner of war. Fifthly, military 'discipline' as an endogenous psychological pressure to avoid surrender. Finally, an 'aversion to surrender' derived from 'the quality of a soldier's training' and the 'culture of the army' in question. These factors depend in turn on 'submission, fear, loyalty and pride', with Ferguson arguing that both 'loyalty to the "primary group"' or small unit to which the individual is affiliated and 'failure of loyalty to the larger entities of regiment, nation, leadership or cause' represent plausible psycho-social determinants of ultimate conduct (Ferguson 2004: 152).

In terms of a simple game that focuses on a soldier's decision to surrender, these factors can be compressed into the probability of surviving the initial surrender process and the subsequent process of imprisonment.

In a conceptually analogous manner to the decision to surrender by an individual soldier, the logic of rational choice can also be applied to the decision by a potential captor of whether or not to accept attempted surrender. Following this logic, Ferguson thus seeks to extend the rationality of the Prisoner's Dilemma game to what he terms the 'Captor's Dilemma'. Ferguson advances four main arguments for accepting the surrender of an enemy soldier: Prisoners can provide useful information; they can act as a valuable source of labour; they can be used as hostages; and they can serve as examples to their comrades to encourage them to surrender. On the other hand, he identifies two chief reasons for not accepting surrender. Firstly, it involves a degree of risk, since the opponent indicating a desire to surrender may be bluffing, with this risk falling overwhelmingly on the individual who must decide whether or not to accept surrender. Secondly,

accepting surrender is costly; not only must the surrendered soldier be transported to the rear under guard – often a dangerous process in battle – but also it reduces the captor's strength on the front by the number of combatants removed to guard prisoners. Ferguson notes that where a prisoner is wounded, and requires assistance, these costs are higher.

In addition to these two reasons not to accept surrender, which act largely on the individual captor and his immediate unit, other plausible considerations apply that affect higher levels of command too. For instance, prisoners of war absorb resources long after capture and the greater the number of such prisoners, the larger will be these longer term costs.

In his description of the nature of decision making in the Captor's Dilemma, Ferguson advances three important qualifications. In the first place, he contends that the Captor's Dilemma 'is really just a variant on the familiar "agency problem"' in economics (Ferguson 2004: 155). Secondly, Ferguson belatedly observes that both the decision to surrender and the decision to accept surrender have common characteristics; 'the parallel decisions – whether or not to surrender, whether or not to accept surrender – seem like a typical problem of game theory' (Ferguson 2004: 155).

Finally, Ferguson argues that although his Captor's Dilemma model has the characteristics of both a game and an agency problem, it needs to be differentiated from the standard cases in economics because 'we need to bear in mind a number of peculiarities of the political economy of warfare' (Ferguson 2004: 155). These 'peculiarities' are threefold: Military training emphasizes cooperation rather than the individualistic conduct of market behaviour; combatants in battle have 'abnormally short time horizons' and focus on the immediate future; and the 'fog of war' means that all levels of an army and its opponents suffer from highly imperfect information.

We would like to address each of these three qualifications in turn. First, with respect to the principal-agent problem, an agency relationship exists when a

principal, such as a private firm or an army, engages an agent to undertake specified tasks, like a production worker or a soldier. An agency problem arises since the aims of the principal and the agent are seldom perfectly aligned. Thus, in the commercial realm, a firm might seek to maximize profits by extracting the greatest possible output from its workers, whereas individual workers might attempt to secure leisure on the job by shirking. Along similar lines, in a battlefield situation, commanders might desire to maximize the number of prisoners captured for informational and other purposes. At the same time, individual soldiers on a personal (and perhaps myopic) cost-benefit assessment may find it more expedient to kill opponents that surrender rather than to bring them back behind the lines in view of the personal costs and dangers involved.

Various well-known solutions exist to ameliorate the agency problem. For example, in market relationships, a commercial enterprise may typically try to calibrate reward with output in order to incentize its workers. In the analogous military situation, elaborate systems of military justice, discipline, promotion and bravery awards have been developed to ensure a closer coincidence between the desires of commanders and the behaviour of their men. This represents a variant of the generic problem of monitoring and enforcement (analogous to the relationship between a manager and the worker in a private firm who would rather shirk than work), common in economics. While the various tangible and more intangible costs and benefits Ferguson outlines are valuable insights, it is not a 'dilemma' in the game theoretic sense of the word, as Ferguson seems to suggest.

In response to the second observation that the 'parallel decisions' seem like a typical problem in game theory, this is problematic in a general sense in there is really no 'typical' problem in game theory. More specifically, such a 'parallel' decision does not resemble a Prisoner's Dilemma in the most important aspects and as such, his decision to use the expression 'Captor's Dilemma' may be misleading to those familiar with game theory.

This critique can be more clearly expressed by contrasting Ferguson's concept with the classic 'two-by-two' Prisoner's Dilemma game illustrated in Figure 1. The two games Ferguson has in mind are in a sense symmetric in that both sides may on some days have to choose between 'fight on or surrender', while on other days they may gain the upper hand and be faced with the decision of whether to kill or capture their defeated foe. Needless to add, one side's victory on the field of battle entails the other side's defeat. However, these 'symmetric' situations are *not* 'Prisoners' Dilemmas'[3], but rather two separate 'two-by-two' games.

In the Prisoners' Dilemma illustrated in Figure 1, both players (like two prisoners under interrogation by the police) have exactly the *same* two options (i.e. confess and thereby 'rat' on their partner in crime; or do not confess to the police).

However, in the game Ferguson envisages, one two-by-two game occurs, for example, when 'Player 1' (say, the 'Allies') has achieved a dominant strategic position in which 'Player 2' (say, an Axis infantryman) may find it difficult, if not impossible, to escape, or even achieve a dramatic turnaround in his dire situation. Player 1 thus must choose to kill his defeated foe or capture him. Roughly simultaneously, Player 2 must choose to fight to almost certain death, or surrender and face the very uncertain prospect of his surrender being accepted and further uncertainty surrounding the conditions of his imprisonment.

The 'symmetric' or rather mirror game which might be played in a successive period is one in which, instead, 'Player 1' ('Allies') is in a dire ('surrender or fight to the almost certain death') situation and Player 2 must decide either to kill or to capture him.

These two players may face repeated confrontations with each other since the same two opposing units confront each other in battle time and again as in the

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[3] While originally the term 'Prisoner's Dilemma' was used, we prefer to use the expression 'Prisoners' Dilemma' as employed in more modern texts, such as Watson (2002), since it more accurately reflects the fact that there are two prisoners in the same situation, facing the same dilemma.

Axelrod case. This may lead to a cooperative equilibrium as in the Axelrod case, or conversely it could result in a spiral of escalating 'revenge' killing on both sides.

In other words, the key difference lies in the fact that in both symmetric games Ferguson has in mind the potential captor and the potential captive face completely different choices. By contrast, in the Prisoners' Dilemma, they face exactly the same choice. Thus, the Prisoners' Dilemma structure is not the appropriate model to capture this 'symmetry'. Indeed, the use of the word 'dilemma' - a word loaded with meaning in the field of applied game theory - can result in misleading predictions.

As for the third set of propositions asserting that the political economy of warfare differs in substantial ways from the standard game theoretic approach in economics, we would not argue with the general point. However, the rational choice methods in economics, as well as in political science, biology, etc., have long incorporated or attempted to explain cooperative behavior, abnormally short time horizons, and imperfect information. While the Prisoners' Dilemma - even its repeated form which may lead to a 'cooperative' equilibrium - is technically speaking a 'non-cooperative game' where the players cannot communicate directly with each other, there is a whole field of cooperative game theory which addresses exactly these possibilities among 'teammates' as well as 'adversaries'. Short time horizons have long been tackled by modeling assumptions of 'myopia', or more recently with 'hyperbolic discounting'. Finally, uncertainty and the related problem of asymmetric information have been incorporated into more complicated models of human behaviour. Thus, Ferguson's qualifications, while important, do not necessarily preclude using game theoretic tools; rather they require slightly more complex tools.

More generally, we would argue that the question of accepting surrender or engaging in 'prisoner killing' by the captor in the Captor's Dilemma model is not simply 'a variation on the familiar agency problem', nor a 'typical problem' in game theory as Ferguson contends. In fact, it is a multi-level game with

interdependency on a number of levels and one must accordingly be very careful mixing game theory metaphors.

Under idealized circumstances, at least three salient features of the 'kill or capture' game would be included in any game-theoretic approach: The repeated nature of the game; the fact that sometimes one actor is the captor, and in other cases a potential captive, thus requiring different, situation-dependent choices; and it is possible that action by one or both sides in one period would alter the payoff matrix in the next period. These features cannot be incorporated into a simple 'normal form' box game as in Figure 1. As for uncertainty and varying probabilities of outcomes, these could be collapsed into a single problem of expected benefits versus expected costs, for each of the respective options each player faces in each period. Thus any fruitful efforts to model this interdependency would require a far greater level of mathematical sophistication.

However, it must be stressed that Ferguson's general point that the decision faced by a captor can be likened to a Prisoners' Dilemma is approximately apt in the following way: Individual actions by infantrymen on the front line may result in 'too much' prisoner killing. The opposing side, faced with essential the same cost-benefit analysis and perhaps similar payoffs (or at least similar in a relative sense over their range of outcomes; i.e. $T>R>P>S$) may also engage in 'too much' prisoner killing. In essence, both sides would have been better off in the sense of fewer casualties all around. Indeed, if Ferguson's reasonable conjecture is correct, a 'quicker' war overall would have resulted, if they had *both* engaged in less prisoner killing. Put differently, as in the Prisoners' Dilemma, the outcome that occurs if both sides blindly, but rationally, pursue only their own self-interest may result in a worst situation (i.e. lots of prisoner killing and a long war), and not the 'social optimum' (i.e. less prisoner killing and a quicker war).

It must be noted that the Prisoner's Dilemma is only one example of how this tragic result can occur. A similar result can occur in situations that invoke the characteristics of the 'tragedy of the commons', as well exemplified in the

problem 'over-fishing' on the open sea or 'overgrazing' cattle on the communal village common. Ferguson does allude to this possibility in passing when he mentions 'collective action' (albeit in a slightly different context) (Ferguson 2004: 153).

In the penultimate section of his paper, Ferguson argues that the shift in the American 'Sykewar' strategy played a critical role in what he perceives as a large increase in the number of surrenders. If this is the case – a proposition we questioned earlier - it can readily be understood in the context of the principal-agent problem mentioned by Ferguson and expanded on here. Quite simply, such a policy may have considerably altered the (expected) cost-benefit analyses of both the American and Japanese armed forces in the Pacific through better, or at least different, information available to both sides in a manner that may have increased overall surrenders.

While the relative impact this one policy had on the larger picture of entire Pacific theatre remains an interesting one, more generally the question of why there were apparently more instances of surrender in World War I than in World War II seems one that can be answered, at least in part, by the preceding discussion of the game theoretic approach. Quite simply, if we view the prisoner taking and killing issue roughly as a Prisoners' Dilemma-type of problem, notwithstanding the above caveats, why was it that more 'cooperative solutions' seemed to have manifested themselves in the First World War?

One possible answer - exemplified in the seminal Axelrod study - is that the key to 'escaping' the dilemma was *repeated interaction*, where a 'tit-for-tat' mechanism could 'enforce' the cooperative solution, in this case less prisoner killing by both sides. This repeated action in the trenches was generally between the same small (battalion) level units who were facing each other for extended periods of time. Even when outgoing battalions 'swapped' with replacement formations, the 'norms' and 'customs' that had developed on both sides were often passed on to the incoming units.

There is a strong case that this type of repeated action was largely non-existent on the Pacific Theatre when the Allies in World War II in the Pacific Theatre were 'island-hopping' from defensive enclave to enclave. This allowed no time to develop a 'rapport' between opposing forces, with little or no repeated contact. Thus, simply put, there may have more 'single shot' Prisoners' Dilemma-type games being played in World War II compared with World War I. This would allow for less opportunity for a 'cooperative equilibrium' to arise and 'norms' to develop between opposing forces. This difficulty in attaining some 'stable cooperative equilibrium' would be made all the more difficult due to a larger linguistic and cultural 'distance' between enemy combatants in the Pacific War.[4] In addition, one could also argue that because World War I was still for many a 'living memory' by the time the Second World War occurred, all other things being equal, it would more likely for such 'norms' to develop between American, British, Dominion and German forces, in conditions of repeated contact. After all, many combatants would have heard of such conduct from their fathers who had fought in World War I.

CONCLUDING REMARKS

What general conclusions can be drawn from both the path breaking approach presented by Ferguson and our critique of his argument? At least three observations seem warranted.

Firstly, developing logical arguments and employing formal models, whether they are collective action problems, Prisoners' Dilemma-style 'box' games, or principal-agent optimization problems, all serve to discipline our intuition. This is presumably why Ferguson introduced these various concepts into

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[4] In Chiswick and Miller (1998), and more recently, in Chiswick and Miller (2004), indices of 'language distance' between English and other widely spoken languages are developed. Both papers find the 'distance' between Japanese and English to be among the greatest. One might thus infer that 'cultural distance' would be greater as well.

his original paper. We all have a general impressions or intuition as to why there may have been more or less prisoner killing in one war compared with other conflicts, but looking more deeply into the incentives and environment that combatants faced and how they might have reacted helps us to ask better questions. Furthermore, models and logical concepts, such as those invoked by Ferguson, also force precision into our arguments. Unfortunately, since Ferguson did not elaborate adequately and accurately on his use of various technical terms, we have not derived the full benefit from their use. Indeed, this may lead to even more confusion. Proper use of technical terms thus forces us not only to be explicit, but also prudent.

Secondly, if we accept the principal-agent view of prisoner killing as a valid theoretical prism with which to examine the problem, then it facilitates the development of refutable hypotheses in the form of important questions. For example: 'How may the principal-agent relationship have differed between World War I and the Second World War such that the latter conflict may have resulted in greater prisoner killing?' Answering questions of this kind enables us to devise rough 'empirical' tests to determine whether, for instance, if the principal-agent relationship differed between the two global conflagrations, the degree of prisoner killing also changed correspondingly. Indeed, this is one of the main arguments Ferguson advances; namely, that the 'Sykewar' war may have altered the cost-benefit computations of the individual combatants towards the end of World War II.

Finally, the use of formal models, like the rational choice techniques employed by Ferguson, may generate new conclusions or unexpected results which we could not have otherwise anticipated. Using a model to tell us something we already know is not half as interesting as if it tells us something we did not know, or at least changes our pre-existing intuition appreciably. In the present context, by differentiating between the purportedly repeated nature of interaction in World War I and the ostensibly less repeated interaction in the Second World

War, we contend that, in addition to the many other factors which may have affected the combatants' decisions in battle, this overarching difference may explain the lower level of prisoner killing.

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