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Second-Strike Nuclear Forces and their Implications for Neorealist Theory

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ABSTRACT

What are the implications of second-strike nuclear forces for neorealism? The end of the Cold War yielded a unipolar structure of international politics defined by the military, economic, and political preponderance of the United States. According to balance-of-power theory, which lies at the heart of neorealism, unipolarity has a short life span as secondary states waste little time in rectifying the global imbalance of power. Thus far, America remains unbalanced. In particular, this paper asks why no significant efforts have been undertaken by the secondary states to balance the United States militarily, considering that such a military balance of power is within their reach? Are we to take this as a refutation of balance-of-power theory? It is argued here that, on the whole, the relevant literature on balance-of-power theory has failed to confront the implications of the nuclear revolution. This paper posits that second-strike nuclear arsenals render void the need to balance superior American military power. Balancing is, after all, a function of the survival imperative. But because state survival is contingent not only upon military invulnerability (for which nuclear weapons are a sure guarantee), but also upon economic invulnerability (which is all but impossible), nuclear-weapon states are impelled to balance superior American economic power for security reasons. Indeed, the paper demonstrates that, other than military power, only economic power can be wielded by states to jeopardize other states' prospects of survival. Hence, by recasting balance-of-power theory in light of these assumptions, neorealism can make sense of the great-power politics of the post-Cold War era.

Balance-of-power theory, central to neorealism[1], is here subjected to a unit-level challenge: nuclear weapons. Specifically, what are the implications of second-strike nuclear forces for balance-of-power theory in the post-Cold War era? Balance-of-power theory is derived from neorealism, itself a systems-theory of international politics. Its systemic nature implies the predominance of structure over agency, or systems-level causes over unit-level causes, in explaining the outcomes of state behaviour. Nuclear weapons, properly viewed, are a unit-level variable (Waltz 1988, 626). In neorealist theory, unit-level forces do not assume major causal importance. In the present context, however, it is argued that nuclear weapons impact importantly upon the structure of the international system, and thus have important implications for balance-of-power theory. Hence, the analysis undertaken herein investigates the nexus between balance-of-power theory and nuclear weapons, a little-explored issue in international relations theory (cf. Weber 1990, 59).

The demise of the Soviet Union transformed the international system's structure from one of bipolarity to one of unipolarity. And American unipolarity, in balance-of-power theory, is expected to be relatively short-lived, as secondary states work to rectify the global imbalance of power. Thus far, this expectation has not been borne out, at least not in the manner intended by most proponents of balance-of-power theory. In particular, this paper asks why no significant efforts have been undertaken by the secondary states to balance the United States militarily, considering that such a military balance of power is within their reach? (cf. Lieber and Alexander 2005, 116-7) My argument confronts this dilemma, and posits that second-strike nuclear forces obviate the need for nuclear-weapon states to balance superior military power. But because state survival can be threatened economically, I show that balancing among nuclear-weapon states is channelled away from the military realm and into the economic realm of international politics.

This paper therefore sets itself three tasks, each of which constitutes a separate section. Hence section one examines and assesses existing statements of balance-of-power theory in the context of post-Cold War unipolarity. Next, section two analyses the impact of nuclear weapons upon the assumptions of balance-of-power theory. The argument in this section asserts that minimum deterrent arsenals are sufficient to render void any further balancing of superior military power, conventional or nuclear. Section 3 explores balancing behaviour among nuclear-weapon states; it finds that, other than military power, only one form of power can be wielded by a state to jeopardize another's prospects of survival: economic power. And unlike military vulnerability, for which nuclear weapons provide an absolute remedy, no such solution is available for states to confront economic vulnerability. Hence the need to balance economic power for reasons of survival.

I. BALANCE-OF-POWER THEORY IN THE POST-COLD WAR ERA

In observing a disjunction between unit-level causes and their international effects, Kenneth Waltz concluded that state attributes do not correlate with the outcomes of state behaviour (Waltz 1979, ch. 4). This led Waltz, the founder of neorealism, to believe that a constraining force interposed between cause and effect, namely, the structure of the international system. A brief consideration of Waltzian structuralism is therefore warranted. Waltz advances a threefold definition of the structure of the international system: (1) the system's anarchic organizing principle; (2) the functional non-differentiation of the system's units; and (3) the

[1] Neorealism is developed in Waltz (1979). Balance-of-power theory henceforth denotes Waltz's formulation of the theory. Similarly, neorealism here refers to Waltzian neorealism, and not to its more recent manifestations (eg defensive realism, offensive realism, contingent realism, balance-of-threat theory, etc).

distribution of capabilities[2] within the system (Waltz 1979, ch. 5). In an anarchic realm, states seeking at a minimum to survive must tend to their own security, since no agent can be counted upon to do so on their behalf. Mearsheimer, paraphrasing the Protestant work ethic, captures the logic of this self-help system: 'In international politics, God helps those who help themselves' (Mearsheimer 2001, 33). Through self-help, states become 'like units'; they are each compelled to perform the same vital functions required to sustain themselves as viable political entities. Although functionally alike, states are differentiated principally by their relative power. Thus, Waltz argues, states' relative power positions within the anarchic international system tell us much about their likely behaviour.

If theories explain laws, and laws are associations that hold repeatedly, then theories explain continuities (Waltz 1979, ch. 1). Continuities abound in international politics: war and the formation of balances of power are two major such cases that have been addressed by neorealist theory (cf. Waltz 2001[1959]; Waltz 1988; Waltz 1979). It is with the latter that we are here concerned. François Fénelon, a seventeenth-century French theologian, is reputed to have been the first to identify the recurrence of balances of power as a law-like association, and not merely the result of intentional statecraft (Halliday, Rosenberg, and Waltz 1998, 382). Waltz writes: 'If there is any distinctively political theory of international politics, balance-of-power theory is it' (Waltz 1979, 117). The reasoning is as follows: 'states, if they are free to choose, flock to the weaker side; for it is the stronger side that threatens them' (Waltz 1979, 127). Balancing behaviour can take two forms: internal and external balancing (Waltz 1979, ch. 6). The former is achieved through measures internal to the state, for instance arms build-ups, the promotion of economic growth, the contriving of thoughtful strategies, etc. The latter is achieved through measures external to the state, namely alliances of stronger or lesser degrees. Which variety of balancing is most prominent depends not only upon the configuration of the international system, of which there are three types - uni-, bi-, and multi-polarity - but also upon the power disparities within those configurations.[3] For instance, superpower balancing in the bipolar world of the Cold War (1945-1990) was primarily of an internal nature, seeing as the relatively weak allies added little to either superpower's relative power (Waltz 1979, ch. 8).

While systems-level causes (anarchy and the distribution of capabilities) in neorealism 'shape and shove', they do not determine state behaviour (Waltz 1986, 343).[4] This indeterminacy is explained by the fact that while all states are subject to structural pressures in varying degrees, how they react to those pressures is a matter of their choosing (Waltz 1979, 68). Waltz argues that states choose to restrict their behaviours to those that will not call forth dangerous balancing behaviour on the part of others. In systems-theory parlance, the international system's 'selector' rewards certain behaviours and punishes others (Waltz 1979, 74). Such a selection process underlies the socializing influence of the system, which in turn offers states a bleak choice: conform and prosper, or rebel and perish. Charles V, Napoleon Bonaparte, Kaiser Wilhelm II, and Adolf Hitler chose the latter and suffered the consequences (Waltz 1990, 743).

My rationale for limiting the present analysis to the post-Cold War world is due simply to the fact that this era has been coterminous with the era of unipolarity. And in balance-of-power theory, unipolarity is the least stable structure of the international system (Waltz 2000a, 27).

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[2] Capabilities in neorealist theory are broadly defined, as are the 'elements of national power' in classical realism. cf. Part 3 of Morgenthau (1948). Waltz's definition of capabilities includes: size of population, territory, resource endowment, economic capacity, political stability, and political competence (Waltz 1979, 131).

[3] Wohlforth, for instance, argues that in the present unipolar world, the power disparity between the United States and the rest of the world is unprecedented in international history. Such a power gap makes both internal and external forms of balancing useless and even counterproductive (Wohlforth 1999).

[4] Fareed Zakaria makes this mistake in a review essay when he states that 'systemic pressures determine states' foreign policy behavior' (1995, 465).

Because secondary states cannot be sure as to how the hegemon will dispose of its international pre-eminence, the logic of anarchy compels them to err on the side of caution and counterbalance the hegemonic power, provided they possess the means to do so. As Waltz laments, '[t]he lesson would seem to be clear: in international politics, success leads to failure. The excessive accumulation of power by one state or coalition of states elicits the opposition of others' (Waltz 1990, 743). What, then, are we to make of the present American 'unipolar moment' so celebrated by Charles Krauthammer? (Krauthammer 1990) Christopher Layne, a disciple of Waltz, imputes in his aptly titled 'The Unipolar Illusion: Why New Great Powers Will Rise' that 'the "unipolar moment" is just that, a geopolitical interlude that will give way to multipolarity' (Layne 1995, 132). In brief, balance-of-power theory argues that American primacy will induce balancing behaviour on the part of secondary states (cf. Waltz 1993; Waltz 2000a; Waltz 2000b; Layne 1995; Layne 2006).

RECONCILING BALANCE-OF-POWER THEORY WITH THE NUCLEAR REVOLUTION

Notwithstanding the expectation that unipolarity will have a short lifespan, the fact remains that American military, economic, technological, and political preponderance perseveres. Writing shortly after the dissolution of the Soviet Union, Layne predicted the return of multipolarity between 2000 and 2010. In 2006, he believed balance-of-power theorists (himself included) had wrongly predicted the implications of unipolarity for three reasons: (1) they ignored the incentives to bandwagon with the United States; (2) they underrated the domestic impediments to balancing American power faced by leaders of secondary states; and (3) they believed it would be easier to balance against Washington than it has been (Layne 2006, 10). He nevertheless readjusted his prediction for the return of multipolarity, this time claiming the unipolar world will be through by 2030 (Layne 2006, 39). Reminding us that balance-of-power theory is indeterminate, Waltz writes that neorealism 'is better at saying what will happen than in saying when it will happen. Theory cannot say when "tomorrow" will come because international political theory deals with the pressures of structure on states and not with how states will respond to the pressures' (Waltz 2000a, 27). He nevertheless insists that a balance of power, 'in historical perspectives, …will come in the blink of an eye' (Waltz 2000a, 30). Glaser, convinced that neorealism has been in trouble in the post-Cold War era, seeks to reconcile it with the actual state of affairs by adding unit-level variables to plug the apparent 'holes' in Waltz's original theory (Glaser 2003). It therefore appears that, when confronted with the question as to why the 'unipolar moment' continues to endure, one of two responses is given: (1) too little time has passed for a balance of power to form; and (2) balance-of-power theory is able to account for the discrepancy once auxiliary unit-level explanations are brought forth to supplement it. The first solution is convenient, and cannot be decisively refuted; the second solution is reductionist. Can this seeming disjunction between theory and reality be resolved without recourse to either of these solutions?

I argue that it can, and that this disjunction results from a failure to confront the implications of the nuclear revolution for balance-of-power theory. The relevant literature on balance-of-power theory has until now largely avoided what is deemed here the vital question: does balance-of-power theory apply equally well in conventional and nuclear worlds?[5] I claim that

[5] Two exceptions to this failure to confront the nuclear revolution and its implications for balance-of-power theory need mentioning. Mearsheimer has touched upon this issue in passing; his conclusions on the matter, however, run counter to my findings in section two (cf. Mearsheimer 1990, esp. 112). Layne has referred to the issue in a footnote, and like Mearsheimer, believes the nuclear revolution impacts little upon the dynamics of military competition in neorealist theory. Indeed, Layne's footnote denies what my paper sets out to accomplish (Layne 1995, 169n).

for balance-of-power theory to hold in the nuclear era, in its original and parsimonious formulation, two core assumptions (not variables) must be introduced: (1) second-strike nuclear arsenals render void the need to balance superior military power broadly conceived; and (2) state survival can be threatened economically. Recasting balance-of-power theory in this fashion permits the theory to apply as effectively in the nuclear era, and among nuclear-weapon states in particular, as it does in a conventional world, as attention is turned away from the military sphere and towards the economic dimension of international politics.

II. THE NUCLEAR DETERRENCE DEBATE AND ITS IMPLICATIONS FOR BALANCE-OF-POWER THEORY

Arthur Lee Burns remarked in 1957 that nuclear weapons have 'abolished the balance of power' (Burns 1957, 509). It is the purpose of this section to validate this statement in relation to the military realm of international politics. The subsequent section demonstrates why the statement is not, however, applicable to non-military realms of international politics. Here, I present the case that second-strike nuclear forces render void the need to balance superior conventional and nuclear military power. But before any such analysis can be attempted, a definitional issue needs attending. Specifically, what exactly is the scope of military balancing behaviour? Let us recall the logic of balance-of-power theory. States interact in an anarchic international system in which survival is necessarily their primary concern. If a state loses power relative to others, its vulnerability is subsequently heightened, which in turn implies a decrease in its security and therefore in its prospects for survival. Thus, all states share a mutual desire to forestall losses in their respective relative power positions in international politics. And this they do through balancing behaviour. Balancing is, after all, a function of the survival imperative. Hence, balancing is invoked only when a consequential decline in a state's relative power position is at issue. Military balancing is therefore defined as the military measures undertaken in an attempt to counteract those military capabilities through which others can undermine one's own relative power.

It is essential not to confound military balancing with military tensions between nuclear-weapon states (cf. Art et al. 2005, 186, 190, 195). Since the dawn of the nuclear age, there has been much of the latter and little of the former. Witness, for instance, the ongoing military tensions between India and Pakistan over the disputed Kashmir province. One could interpret the respective Indian and Pakistani military investment in this dispute as a classic case of military balancing among nuclear-armed states. And yet the loss or gain of Kashmir for either side will not alter the balance of power between India and Pakistan in any significant way. Put differently, their respective prospects of survival do not turn upon the loss or gain of Kashmir. As a result, their military activities do not constitute military balancing. Balancing behaviour is always directly or indirectly linked to the need and desire to survive. Any other military behaviour is non-balancing behaviour, and thus cannot be explained by balance-of-power theory (a theory predicated on the survival motive). Consequently, the analysis undertaken below intends to show that retaliatory nuclear forces protect against external military attack those interests the loss of which would adversely affect one's relative power. This covers not only a state's manifestly vital interests, which if attacked would directly endanger its survival, but also those lesser interests which if attacked would indirectly threaten its survival, since such an attack would decrease its relative power and render it more vulnerable to subsequent military action by others.

SECOND-STRIKE NUCLEAR FORCES AND THE ASSUMPTIONS OF BALANCE-OF-POWER THEORY

A second-strike capability obtains when a state, having suffered a nuclear first strike from an adversary, retains the means to retaliate with nuclear force (cf. Wohlstetter 1959). When a

retaliatory strike is sufficiently potent to inflict upon an aggressor 'unacceptable damage', the conditions for an assured-destruction capability are met. 'Unacceptable damage,' however, is subjectively measured and is dependent upon a state's strategic culture (Sheehan 1996, 174, 177). It is perhaps not inconceivable that the Soviet Union may have tolerated the devastation of one or two of its major cities during the Cold War, especially in light of the 20 odd million deaths it suffered in World War 2, if such were the price for defeating the U.S. More specifically, had Moscow possessed the ability to launch a counterforce strike against the American nuclear arsenal, and was certain to disarm all but a few nuclear warheads which would have subsequently been launched against the Soviet Union, it may well have concluded that this was an acceptable price to pay for victory (Wohlstetter 1959, 213-4). One wonders, then, whether strategic culture is easily factored into a nuclear-armed state's nuclear targeting policies, so as to meet the requirements for assured destruction in relation to all potential adversaries.

Targeting Requirements for Assured Destruction

An assured-destruction capability involves countervalue targeting; it seeks to maximize urban-industrial damage. Countries with relatively high levels of urbanization and population density are particularly vulnerable to counter-city strikes. Thus, some American urban planners and others sought to redesign cities in ways that minimised their vulnerability to nuclear attack. The resultant 'defensive dispersal' movement floated ideas such as cluster, ribbon (or linear), and doughnut cities, which would survive atomic attacks (Brodie 1946, 99-106; Kargon and Molella 2004, 766-7). Several civil defence initiatives, including the 1951 Industrial Dispersal Policy, the 1954 National Housing Act (which encouraged suburbanisation), and the 1956 Federal Aid Highway Act designating 'Interstate and Defense Highways', were also induced by the bomb (Dudley 2001, 58-60). The advent of thermonuclear weapons thousands of times more powerful than atomic bombs dealt 'defensive dispersal' an almost lethal blow, as fall-out now threatened even those city dwellers that survived the initial blast (Dudley 2001, 56; Kargon and Molella 2004, 777).[6] For countries with relatively low urban concentration levels, assured destruction will depend more on the effects of radiation in the short term, and on genetic effects and the effects of strontium-90 in the longer term, all of which are produced by fall-out (Kissinger 1957, 73-85). Besides, fall-out effects are maximized by the ground bursting of megaton weapons, especially in urban concentrations in which brick constructions are prevalent, given that the silicon in bricks, and the lime in mortar, 'become highly radioactive' (Kissinger 1957, 75). The blast, heat, and fall-out effects of nuclear detonations can be exploited to maximize death and destruction in any country.

In addition to population targeting, an assured-destruction capability also involves economic targeting. The most effective type of economic targeting, it has been demonstrated, is the impairment of an adversary's recovery economy (Ball 1984, 237). Counter-recovery targeting is accomplished in one of two ways: (1) the bottleneck approach; (2) the Congreve approach (Ball 1984, 237). Bottleneck targeting involves damaging or destroying critical nodes and sectors of an adversary's industrial and economic infrastructure. Bottlenecks are 'target systems which contain only a relatively few installations whose destruction would have immediate and disproportionate effects' (Ball 1984, 237). Examples include fertilizer plants essential for agriculture; ball-bearing factories upon which a wide range of industries depend; and oil refineries vital for everyday civilian applications (Ball 1984, 237; Kennedy and Lewis 1986, 205). To be sure, such a targeting strategy assumes that these bottlenecks are easily identified and hence vulnerable to discriminatory attacks (Ball 1984, 237; Kennedy and

[6] Still, the movement addressed concepts such as underground and underwater cities, and still greater dispersal, to lessen these radiation effects (Dudley 2001, 56).

Lewis 1986, 206-7). Surveillance, photo reconnaissance, and human intelligence may go some way in locating bottlenecks, but this may not always be so, in which case use will be made of the Congreve approach whereby indiscriminate attacks on capital infrastructure are prosecuted so as to degrade a country's industrial and economic potential. The Congreve approach employs the following calculus: 'The larger the plant in terms of output of goods, the more important it ranks as a target; the type of goods produced is much less important than the estimated value of the goods destroyed' (Ball 1984, 237-8). Either way, an adversary's industrial and economic potential is vulnerable to precise, small-scale attacks.

Survivability and Delivery of Strategic Nuclear Forces for Assured Destruction

Thus far, no attention has been paid to the survivability of the strategic nuclear forces, or to the delivery of nuclear warheads to their targets, with respect to an assured-destruction capability. Both issues are taken up in turn. The strategic nuclear forces of a sophisticated nuclear arsenal are divided into three components, which together constitute the strategic 'triad': (1) land-based inter-continental ballistic missiles (ICBMs); (2) sea-based submarine-launched ballistic missiles (SLBMs); (3) manned bombers. Neither component is in any real sense vulnerable, although the ICBM component is generally considered to be more vulnerable than its counterparts. The SLBM force aboard nuclear-powered ballistic-missile-carrying submarines (SSBNs) is normally the least vulnerable component, by virtue of the ability of SSBNs to operate at almost undetectable levels in expansive oceans. The manned bomber force, if kept on adequate alert, will escape total destruction, especially if a portion of the force is kept on continuous airborne patrol. But ICBMs, whose fixed-site locations may be known to an adversary, are relatively more prone to enemy destruction. Even mobile ICBMs can be located and tracked through aerial and satellite reconnaissance. Importantly, it is worth noting that 'with nuclear weapons, if any part of a force is invulnerable, all of the force is invulnerable' (Waltz 2003, 143; cf. Brodie 1984, 9). The triad has three legs but can stand on one.

Admittedly, the acquisition and maintenance of such sophisticated forces would require considerable budgetary investment, itself co-ordinated to the similar efforts of other nuclear-weapon states. Surely this would seem to contradict the argument presently being advanced, namely that second-strike forces render unnecessary the need to balance superior military power. The concept of the strategic triad, however, greatly exaggerates the efforts required of an assured-destruction capability. Unconventional and less sophisticated means of strategic nuclear delivery are almost as effective, and in some cases may be just as efficient, as the more conventional and sophisticated delivery means discussed above. An important study on the threat of nuclear terrorism against the U.S. expressly states that the assumption 'that the delivery of a nuclear weapon against the United States is a challenge' is 'dead wrong' (Allison et al. 1996, 12).[7] Moreover, the Allison study argues, 'the means of delivery into or against the United States are essentially infinite' (Allison et al. 1996, 13; my emphasis). It posits that nuclear weapons and fissile material are easily transportable. One hundred pounds of highly enriched uranium (HEU) has a blast equivalent of 10-20 kilotons (ie as powerful as the atomic bomb dropped on Hiroshima), and yet is no larger than the size of a grapefruit (Allison et al. 1996, 1). Alternatively, '[a] quantity of plutonium the size of an apple is enough to make a simple fission weapon' (Allison et al. 1996, 45). Also, nuclear weapons themselves exist in sizes small enough to be carried in a backpack, in a small truck, or in the boot of a car (Allison et al. 1996, 46). In addition, no health risks attend the human

[7] Henceforth referred to as the Allison study. Allison et al. lament the 'remarkably little literature on unconventional means of delivery' (1996, 69). Their study, however, focuses on the threat of nuclear terrorism, and not on the ease with which an assured-destruction capability can be mounted, which is the argument I am presenting here.

transportation of weapons quantities of fissile material. The radioactive alpha particles emitted by plutonium cannot penetrate human skin. Hence plutonium is easily carried in a person's pocket free of harm (Allison et al. 1996, 44). HEU is barely radioactive and can be handled directly in a very safe manner (Allison et al. 1996, 45, 67).

Transportability aside, how are nuclear weapons and fissile material to be delivered to their destinations? The Allison study discusses the porous nature of American borders. It distinguishes between legal and illegal points of entry. Of the former, there are 301. Consider, for example, the case of shipping ports. A 2004 study by a national non-profit public interest organization on port security in the U.S. reveals that only 4-6% of annual inbound freight is inspected by the Coast Guard and the Customs Service (Public Citizen 2004).[8] That corresponds to 7.52-7.68 million uninspected containers every year, in which nuclear weapons or fissile material could easily be hidden.[9] It has even been suggested that nuclear weapons could be delivered in component form via the postal service (Allison et al. 1996, 69). Although customs inspectors patrol legal points of entry, 'none … are trained or equipped to detect nuclear materials' (Allison et al. 1996, 65). And while radiation detection equipment exists in the U.S., it does so only at a very limited number of sites (Allison et al. 1996, 67). Radiation detectors, whether active or passive, are nonetheless inadequate and inefficient, and almost useless in the event that nuclear weapons or fissile material are shielded so as to evade possible detection (Allison et al. 1996, 67-8). These efforts may after all be negligible, since any inspection and detection efforts are undertaken 'only after' the inbound cargo has arrived at sea and air ports 'in or near major U.S. cities' (Allison et al. 1996, 65). But by this time, it would obviously be too late to intercept a retaliatory blow; a nuclear weapon exploded on arrival at a U.S. port would be just as effective and just as destructive a countervalue strike as an attack with an ICBM on the same target. Concerning illegal points of entry, one need only note the U.S. government's inability to prevent both drug smuggling and illegal immigration (Allison et al. 1996, 66). The Allison study remarks that '[t]here is no reason why a nuclear weapon is less likely to make it into the United States than a bale of marijuana, a packet of heroin, or a farm worker from Latin America' (Allison et al. 1996, 66). In sum, an assured destruction capability need not require sophisticated strategic delivery systems; a relatively unsophisticated and unconventional nuclear arsenal is not necessarily more vulnerable than the U.S. Strategic Triad, especially if an ample supply of fissile material is available.

Inasmuch as the strategic nuclear forces vital to an assured-destruction capability can be made invulnerable, what are the requirements for their supporting command, control, and communications (C^3) architecture? C^3 systems are intrinsic to an assured-destruction capability, but are 'inherently more vulnerable than the strategic forces themselves' (Ball 1981, 37). Specifically, C^3 systems are vulnerable not only to those attacks directed at the strategic nuclear forces, but also to additional attacks and collateral effects (Ball 1981, 10). But it is important to stress here that among possible nuclear postures, an assured-destruction capability demands the sparest C^3 network. After all, the sole C^3 requirement for an assured-destruction capability is to ensure a secure communications link from the national command authorities to the actual strategic nuclear forces (Ball 1981, 6). Such a link provides the means by which a political leadership would instruct the commanders of the deterrent forces to execute the retaliatory mission. While a two-way communications link between the leadership and the forces is preferable, only a one-way link from the leadership to the forces is imperative (Ball 1981, 6). This requirement is easily accommodated at little expense simply by increasing the redundancy of communications links. And this is achieved by laying down additional hardened underground dual- or multi-thread cables, by extending the range of radio

[8] Similarly, Allison claimed in January 2004 that only 2% of the estimated 7 million inbound shipping containers estimated for 2004 would be opened for inspection. (Allison 2004)

[9] My calculation.

and satellite transmission channels, or by developing alternative underground/airborne national command posts from which orders could also be disseminated to the forces. Having established a C^3 network of adequate redundancy to fulfil an assured-destruction capability, only maintenance efforts are needed hereafter. Overall, the requisite C^3 architecture to ensure assured destruction can be wrought upon an opponent is minimal, and need not be attuned to the efforts of actual or potential rivals.

'The Great Equalizer'

With only a relatively small number of nuclear weapons, a country can deter all major nuclear and conventional military attacks that threaten its survival. Hence the concept of minimum deterrence, whereby one retains only enough nuclear weapons so as to inflict upon an aggressor unacceptable damage in a second (retaliatory) strike. It is because the requirements of deterrence are few and finite that nuclear weapons are considered 'the great equalizer'. Strategic parity thus results among states armed with retaliatory nuclear forces; as Robert Jervis reminds us, 'nuclear superiority doesn't matter' (Jervis 1979). But is the notion of conventional military superiority among nuclear-weapon states similarly flawed? Answering negatively requires showing how superior conventional military power might be brought to bear on a nuclear-armed state in ways that do not prompt an all-out nuclear exchange.

Consider for instance North Korea, which in many ways represents an ideal test case; it has recently acquired a rudimentary nuclear arsenal, and its conventional forces are very weak in relative terms. In light of the diplomatic tensions that pervade U.S.-North Korean relations, especially over the issue of Pyongyang's accession to the nuclear club in October 2006, one wonders how Washington might employ its superior conventional military power against North Korea. The application of superior conventional firepower, even if only of a limited nature, against North Korea would in all probability intentionally or inadvertently destroy vital C^3 systems through which Pyongyang would order a retaliatory strike were its vital interests compromised (cf. Posen 1984, 88). With these systems inoperable, North Korea would in effect be disarmed. Thus, it is most likely that the North Korean leadership, fearing the loss of its second-strike capability, would order a retaliatory strike before its communications links to the nuclear forces were completely severed. And this would consequently work to reinforce its deterrent threat against both American nuclear and conventional attack, limited or all-out, especially as North Korea's nuclear arsenal, although limited, holds several major American cities hostage, if only by means of those unconventional delivery methods discussed earlier (cf. Ball 1981, 37).

The conclusion now seems apparent. Namely, minimum deterrent arsenals void the need to balance superior nuclear and conventional military power, seeing as such power can in no meaningful way be used to increase one's relative power in relation to a nuclear-weapon state. If nuclear weapons equalize military power differentials, the third definition of the structure of the international system in neorealist theory – the distribution of capabilities – is altered. More precisely, insofar as the military dimension of international politics is concerned, the systemic incentive to check and balance superior military power disappears altogether.

III. BALANCING AMONG NUCLEAR-WEAPON STATES

The conclusions of the preceding section are open to misinterpretation. Specifically, they could lend support to the belief that nuclear weapons have rendered obsolete balance-of-power theory in the nuclear age. With second-strike nuclear forces, one could argue, a country's survival is guaranteed. And since balancing is a function of the need and desire to survive, balance-of-power theory loses its explanatory power in the nuclear age, or at least its ability to explain the outcomes of nuclear-armed states' behaviour. It is the purpose of this section to prove the falsity of this argument. The following analysis explores why balancing

behaviour does indeed persist among nuclear-weapon states, and asks what form this behaviour takes.

THE SOFT BALANCING DEBATE AND ITS FLAW

The literature dealing with the absence of military balancing among nuclear-weapon states has generated the novel concept of 'soft balancing' to refer to those non-military means of attempting to balance American power since the end of the Cold War. Soft balancing subsumes a host of non-military balancing measures; among the more important include: balancing through international institutions (in particular the United Nations Security Council) and the assembling of diplomatic coalitions more broadly; economic competition; regional economic and political integration; and the denial of military basing rights (Pape 2005; Paul 2005; Brooks and Wohlforth 2005; Lieber and Alexander 2005; Oswald 2006; Walt 2005, esp. ch. 3; Layne 2006b, esp. ch. 7).

To be sure, the soft balancing literature was spawned by the attempt to reconcile balance-of-power theory with the dilemma noted in section one: that no military balance of power has yet formed to check America's overweening military capability. Notwithstanding this, I argue that soft-balancing theorists have betrayed a common mistake. Namely, soft balancing has collectively been treated as a means of balancing American military power. And yet military balancing, as section two demonstrated, is meaningless among nuclear-weapon states, seeing as no such state can usefully bring its military power to bear upon another's vital interests. Additionally, as section two also illustrated, second-strike nuclear forces deter even those limited military missions that fall far short of threatening a state's vital interests. Why then are nuclear-armed secondary states believed to be soft balancing America's impotent military superiority? Soft-balancing theorists are right in saying that secondary states are soft balancing the United States, but are wrong to suggest that it is American military power those states are fearful of.

If nuclear-armed states are capable of deterring any significant military attack upon its vital and lesser interests, why does economic and technological competition among them nonetheless persist? Is not balancing after all a function of the survival imperative? Worded differently, do not states balance superior power so as to reduce their own vulnerability to attacks that could well threaten their very survival? The answer would seem to be clear: if states continue to balance non-military power, despite their being possessed of retaliatory nuclear forces, then states must be aware that their survival is not contingent solely upon remaining militarily invulnerable (for which nuclear arsenals are a sure guarantee). Consider, for instance, Aaron Friedberg's (1991, 271-2; my emphasis) description of economic balancing behaviour in international politics, which can stand for a host of other similar statements:

> In the past, nations have often used economic instruments as a way of attempting to influence the political behavior of their rivals…. Such practices could become more common in the years ahead, as interdependence intensifies, political relationships shift, and the utility of military power in most situations remains relatively low. National security policy may, therefore, come to encompass measures designed to reduce a country's vulnerability to economic influence attempts (and, perhaps, to enhance its capacity for exploiting the vulnerabilities of others)…

Friedberg's analysis of 'economic statecraft' falls short in that it nowhere questions the purpose of economic competition in the nuclear age (Friedberg 1991, 271). To say that states traditionally compete for power and plenty is, after all, perfectly consonant with the notion of military balancing. Namely, states compete economically for the simple reason that economic power is merely latent military power (cf. Mearsheimer 2001, ch. 3). But as should be clear

by now, those nuclear-weapon states that have grasped the conclusions of section two have little or no incentive to balance superior military power. For this reason, the argument that economic competition is motivated by the prospect of gains in latent military power rings hollow in the nuclear age. Surely, then, economic competition must be geared toward other objectives. It is toward these other objectives that the analysis now turns.

ECONOMIC VULNERABILITY AND STATE SURVIVAL: EVIDENCE OF A CAUSAL CONNECTION

That militarily invulnerable states (ie nuclear-weapon states) balance non-military power suggests quite forcefully that state survival can be undermined by non-military means. At least, this much was established above. An exploration of all those non-military means by which a state's prospects of survival can be jeopardised is therefore warranted. Toward this end, students of transnational security issues have shed considerable light. The numerous non-military threats to state survival extant in the post-Cold War era can be categorized as follows: (1) economic; (2) technological; (3) disease and international pandemics; and (4) global environmental degradation and climate change.[10] These four groupings are addressed in turn.

Economic threats are:

both diffuse and systemic; they may be unintended or a secondary consequence of state action. Nonetheless, the consequences of macroeconomic malfeasance by a major economic power, the collapse of financial markets triggered by a major debt repudiation, a generalized hyperinflation, or a collapse of currency markets could, singularly or in combination, threaten the very survival of the state (Sperling and Kirchner 1998, 230)

In addition to these, Dupont (1997, 36) enumerates still more potential sources of threat:

The fundamental point is that economic threats to security in the form of disruptions to global commerce and financial transactions, economic coercion, trade sanctions, protectionism, resource disputes and arguments over market share and market access constitute a whole range of relatively new threats to security which may be just as serious and pervasive as traditional politico-military threats.

Given that economic power can be employed in so many ways, and given the wide-ranging nature of the threats it generates, states can wield the economic weapon with considerable discrimination and control. Admittedly, a state is unlikely to prosecute those economic attacks that threaten another state's survival in an unequivocal manner. For instance, an embargo against a nuclear-weapon state, which at once threatened the latter's vital interests would be akin to launching upon it a nuclear first strike; both cases would doubtless invite nuclear retaliation. Thus, an important proviso is in order. A state's range of usable economic instruments therefore extends only to those that could be employed without unambiguously jeopardising a nuclear-armed state's manifestly vital interests. Translated in practical terms, nuclear-weapon states can only threaten each other's survival over the medium- and long-term.

Properly understood, technological power is a prerequisite for economic power (Sperling and Kirchner 1998, 224-5; Luttwak 2002, 10; Friedberg 1991, 275).[11] On its own, technological power can do very little in way of harming a state's vital interests. A recent exception may be cyberwarfare, with which Russia experimented in May 2007 when it delivered a 'distributed

[10] I have compiled this categorization from the following surveys and analyses of transnational security issues in the post-Cold War era: Smith (2000); Dupont (1997); Sperling and Kirchner (1998).

[11] When the level of technology is equivalent between states, more populous countries will generate greater output. Technologically superior countries, however, will need less population to produce the same output.

denial of service' (DDOS) attack on Estonia after the latter provoked a diplomatic row with Moscow when it removed the Bronze Solider (a Soviet-era war memorial) from its capital Tallinn. This DDOS internet-levelled attack affected over one million computers, and temporarily paralysed Estonian telecommunications services and government, financial, and media websites (The Economist May 26-June 1 2007, 61). Nevertheless, it remains inconceivable that a state could marshal this technology in a manner that threatened a nuclear-weapon state's vital interests; at least, not without incurring devastating nuclear retaliation. Technology is a fungible asset that can readily be channelled down various avenues of state power. Hence, as Sperling and Kirchner note, the very 'source' of economic power 'is dominance of the technological frontier' (Sperling and Kirchner 1998, 225).

Only in the worst-case scenario can diseases and international pandemics threaten the survival of the state (Smith 2000, 85). For instance, one need only witness the devastating effects of the AIDS epidemic in much of sub-Saharan Africa. Admittedly, were this epidemic to endanger state survival, it would do so chiefly by undermining the economic foundations of the state (Smith 2000, 85). That is, the large-scale loss of life would adversely affect a state's labour force, without which a state cannot remain politically viable. In any case, it is all but impossible for a state to wield this category of threats in any meaningful way. Perhaps a country could infect a nuclear-weapon state's population with a lethal pandemic, but the ramifications of such an act come dangerously close to those associated with the radiation effects of nuclear weapons. Namely, it would provide sufficient justification for destroying the attacker's cities that are held hostage by the victim state's second-strike nuclear forces.

Global environmental degradation and climate change currently pose a plausible threat to state survival in only one way: rising sea levels (Smith 2000, 86). Indeed, for several South Pacific states, such a prospect constitutes their primary national security threat (Smith 2000, 86). Still, this potentiality is limited specifically to small island states or to countries with maritime borders, none of which are nuclear-armed great powers (the focus of the present study). Thus, it is of little relevance to my argument. Moreover, it would be ludicrous to assume that a state can effectively wield the threat of rising sea levels to endanger another's survival.

In sum, the above dissection of possible non-military threats to state survival yields an important conclusion: a nuclear-weapon state's survival can be intentionally jeopardised only by economic means. Technological power, as stated earlier, is merely an adjunct and facilitator of economic power. Importantly for balance-of-power theory in the nuclear age, this analysis would suggest that, among nuclear-weapon states, balancing – as a function of the survival imperative – manifests itself largely in the economic dimension of international politics. Thus far, the discussion has been entirely theoretical. A brief consideration of an important empirical corroboration of this finding is documented below.

An extensive debate exists as to why the Soviet state collapsed, pitting three broad schools of thought: (1) the economic implosion thesis; (2) the triumphalist (or vindicationist) explanation (Wolfowitz 1993; Zubok 2000, 355); and (3) the 'Gorbachev as Great Man' explanation (Hermann and Ned Lebow 2004, 16; Brown 2004; Kramer 1990). It is with the first approach that we are here concerned. Indeed, this school of thought stresses that the Soviet state's collapse had a dominant economic element. If it can be shown that this economic element reflected the relative distribution of economic capabilities internationally, my argument will be validated to a certain extent. The evidence, keeping in mind its easy manipulation, is nonetheless promising. Thus, we find Soviet Premier Mikhail Gorbachev remarking in May 1986 that 'the Soviet Union is 'surrounded not by invincible armies but by superior economies'' (Waltz 1993, 57). Wallander hits the nail on its head when she argues that the West 'did contribute to the decline of the Soviet Union in limited and specific ways and thereby played a role in the state's collapse' (Wallander 2003, 137; first emphasis in

original). The West's successful exclusion of the Soviet Union from the international economic system aggravated the USSR's internal economic problems, low factor productivity being the most prominent among the latter (Wallander 2003, 144, 146-7). But Wallander stresses that even with these important structural problems afflicting the Soviet economy, the latter 'was not in danger of grinding to a halt', thus affirming the primacy of international causes over domestic ones (Wallander 2003, 148). Wohlforth, reaffirming this causal primacy, recounts the dire economic situation Gorbachev found himself in at the end of 1989, when 'NATO held a long list of trade restrictions against the Warsaw Pact and a European Community was on the verge of a new wave of exclusionary economic integration' (Wohlforth 1995, 34).

Even those inclined to assign the blame for the Soviet Union's collapse to Gorbachev's reforms – his 'perestroika' and 'glasnost' policies of economic restructuring and political liberalization respectively – overlook the very motivation for those reforms. And yet Bova argues that Gorbachev's policies, which indeed precipitated the unravelling of the Soviet Union, were motivated more by external concerns than they were by internal ones (Bova 1992). Gorbachev believed that for the Soviet Union to retain its position in international politics, Moscow had to adjust to the evolving global economic climate. He believed his reforms would be a significant step in this direction, but did not anticipate their actual effects (Bova 1992, 52). At bottom, econo-centric explanations of the dissolution of the Soviet Union hold considerable merit, and seem to fit much better with the facts than do alternative hypotheses.

If indeed a causal connection underpins the negative correlation between economic vulnerability and state survival, then this implies that the relative-gains problem is shifted away from the military arena and into the economic one. Indeed, studies by realists in the field of international political economy stress that relative-gains seeking is prominent in the economic relations of states (cf. Mastanduno 1993, esp. 256-7; Grieco 1993). But they nowhere argue that this obtains because relative-gains seeking at the military level is rendered altogether unnecessary by second-strike nuclear arsenals. Nor do these studies posit, as I do here, that this concern for relative economic gains is a direct function of the fact that a state's survival can be intentionally undermined economically. Consider, as example, Liberman's study of relative economic gains. He asserts unequivocally: 'The most basic condition affecting a state's sensitivity to relative gains is the degree of military threat posed by its rival/partner' (Liberman 1996, 151). He adds that '[w]hen war is improbable, states worry less about shifts in relative power' (Liberman 1996, 151). To him, 'nuclear deterrence has dampened the military significance of economic advantage and mitigated the security component of the relative-gains problem' (Liberman 1996, 175). How, in this last quote, can the second clause follow from the first when a state's survival can be threatened economically? Simply put, nuclear deterrence does not guarantee state survival, as the case of the Soviet Union demonstrated all too well.

Whereas nuclear weapons are a sure guarantee of a state's military invulnerability, no such remedy exists for economic vulnerability. Hence, if my argument is valid, balances of economic power should be a recurrent feature of international politics in the nuclear age. The urgency with which they form, however, should be greatly reduced, seeing as stakes are higher in security affairs than they are in economic ones; a state's survival is more promptly threatened militarily (in a conventional world only) than it is economically (Lipson 1993, 75). But the fact that a Cold War superpower can fall by the wayside as a result of relatively insufficient economic power can only reinforce in other nuclear-weapon states the need to balance superior economic power for reasons of security. Finally, if the analysis presented in this section were right, one would expect a balance of economic power to form in the post-

Cold War era, or at least economic balancing behaviour on the part of secondary powers. After all, the United States remains today unchallenged as the pre-eminent economic power.

CONCLUSION

The hypothesis formulated thus far stands as follows: in the unipolar post-Cold War era defined by the military, economic, and political preponderance of the U.S., secondary states possessed of second-strike nuclear arsenals refrain from balancing superior American conventional and nuclear military power and instead channel their balancing efforts primarily into the economic dimension of international politics. This they do because their survival is not merely contingent upon remaining militarily invulnerable, but also economically invulnerable. And while deterrent strategies make possible the former, there is no conceivable means of fulfilling the latter other than to accumulate an appropriate amount of economic potential relative to others; enough to stave off economic bullying without engendering counterbalancing actions on the part of others.

Specifically, I claim that states, for purposes of security, actively intervene in the economy to further the pursuit of relative economic gains. To be sure, such behaviour conflicts with the laissez-faire economic platforms of certain governments. Therefore, if even these governments behave as I predict, my argument would be validated to a certain degree. As members of the moderately liberal (non-interventionist) UMP party, one wonders whether former French president Jacques Chirac and his successor, Nicolas Sarkozy, abstain(ed) from the type of intervention my argument predicts. French industrial policy, however, has not shied from intervening in the economy, especially when relative economic gains were at stake. In 2005, the then prime minister, Dominique de Villepin (UMP), following a failed attempt by American-owned PepsiCo to take over the French food giant Danone, outlined "a list of strategic industries that would remain forever in French hands" (The Economist, 14/7/2007, 67). In relation to Boeing-Airbus subsidies, Washington outspends the European governments combined by a ratio of ten to one (The Economist, 23/6/2007, 67). Situations such as these remind secondary powers of the risks of leaving U.S. economic power unchecked, and thus encourage interventionist industrial practices. Hence France's dilemma, which is succinctly captured by The Economist: "The trouble with moving from interventionist industrial policy to a hands-off, liberal approach is that you have to intervene, and get your hands dirty, to get from here to there" (The Economist, 14/7/2007, 68). Much the same way that the survival motive impels civilian leaders to intervene in military policy (cf. Posen, 1984), the survival imperative sometimes occasions governments to intervene in the economy, even though the latter is often largely held in private hands.

If the argument presented in this paper is correct, and if it is indeed true that state survival is contingent not only upon military, but also economic, invulnerability, then the unit-level challenge (ie second-strike nuclear forces) to balance-of-power theory will be feeble indeed. Because states lack the means to ensure economic invulnerability, nuclear-weapon states are condemned to balance superior economic power. Hence, to paraphrase that old adage, the foregoing analysis would appear to suggest that even among nuclear-weapon states, it is balance-of-power politics as usual.

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