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Concentration, Polarity, and the Distribution of Power

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Scholars of international relations generally rely on polarity to measure the distribution of power. I argue that another feature of this distribution—concentration—should be considered more carefully in analyses of international relations. Much of the recent literature on the distribution of power draws on analogies between the structure of markets and the structure of the international system. Concentration is more consistent than polarity with the microeconomic foundations of these studies. Further, using polarity to measure the distribution of power also requires analysts to assume (often implicitly) that: (1) inequalities among major powers are unimportant features of the global distribution of power; and (2) nonpolar major powers should be ignored in structural analyses of international relations. I maintain that these assumptions are at odds with many leading explanations of international relations. A number of prominent theories of balancing behavior, the onset of war, and the international political economy emphasize both the importance of both major (as well as polar) powers and the inequalities in power among them. As a result, analyses that center solely on the effects of polarity are likely to offer incomplete explanations of balancing behavior, the onset of war, and the international political economy. Since concentration measures both the number of major powers and the inequalities in power among them, these analyses may be enhanced substantially by considering the influence of concentration, as well as polarity.

Introduction

Studies of the distribution of power occupy a prominent position in the field of international relations. Debates surrounding the importance and nature of its effect have long formed the basis of research in this field. Many of these disagreements stem from controversies over what is meant by, and how to measure,

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the distribution of power. Central to this topic is the issue of which aspect of the distribution of power should be emphasized in analyses of international relations.[1]

The resolution of this issue obviously depends upon the research question that is posed. The argument of this paper is that, for the purposes of explaining patterns of balancing behavior, the onset of war, and many aspects of the international political economy, scholars are likely to find it useful to analyze both features of the distribution of power that have been used repeatedly in studies of international relations: (1) polarity; and (2) concentration. I begin by examining the conceptual advantages and limitations of each of these variables. I then analyze how they may be used in conjunction with one another to explain patterns of these aspects of international relations.

Both polarity and concentration are consistent with realist explanations of these outcomes; and each variable provides much useful information about the distribution of power. Many analysts, however, consider polarity to be the most important dimension of the distribution of power. Although polarity has been defined and measured in a variety of different ways, one of the most popular methods involves counting the number of states that are "particularly powerful" relative to the remaining states in the system. Indeed, many of the most influential and important treatments of international relations have utilized this approach to measuring the distribution of power.

In this paper, I argue that, despite the fact that the use of polarity has enabled political scientists to make significant advances, it is also fraught with a number of limitations. Measuring the distribution of power by counting the number of poles is not entirely consistent with the microeconomic foundations of many contemporary realist theories. Nor does this approach capture either power inequalities among major powers or the number of (polar and nonpolar) major powers. Since many realist theories of balancing behavior, the onset of war, and the international political economy emphasize the effects of these aspects of the distribution of power, relying exclusively on the number of poles is likely to lead to incomplete explanations of these outcomes.

These limitations can be redressed, in part, by focusing on concentration as well as on the number of poles in the global system. Concentration is entirely consistent with the microeconomic underpinnings of modern realist explanations of international relations. Unlike polarity, it also incorporates both the power inequalities among the major powers and the number of (polar and nonpolar) major powers. Despite the fact that concentration possesses these useful properties, it has (with the notable exception of research on war) been analyzed quite sparingly in studies of international relations.

I maintain that examining the number of poles and concentration in combination with one another is likely to provide a much richer description of the distribution of power than is possible by relying solely on either variable. Moreover, this research strategy is likely to enhance substantially the explanatory power of realist analyses of balancing behavior, the onset of war, and the international political economy, which have often focused only on the influence of polarity. Critiques of realist theories have become increasingly widespread. One line of attack on theories of this sort has been based on the argument that the distribution of power fails to adequately explain patterns of a variety of international outcomes. The argument advanced in this paper suggests that, to the extent that these charges are warranted, the shortcomings of many realist explanations may inhere

[1]Of course, another important issue is how should power be measured. For analyses of this issue see Lasswell and Kaplan (1950), Harsanyi (1962), Sprout and Sprout (1965), Nagel (1975), Dahl (1976), Baldwin (1979, 1980), Waltz (1979, 1986), Keohane (1984, 1986), and Frey (1986).

not in their emphasis on power, but rather in the manner in which the *distribution* of power is defined and measured.

Neorealism and Polarity

Among scholars of international relations, the importance of power is emphasized most strongly by political realists. One of the most important recent developments in the field of international relations has been the systematic and rigorous reformulation of political realism. This reformulation, often referred to as "neorealism," has led to many theoretical advances and is characterized by the following assumptions: (1) states are the primary actors in the international system; (2) the international system lacks any supranational authority with a monopoly on the legitimate use of force (and is therefore anarchic); (3) in the absence of any supranational authority, each state must ensure its own security, which depends on its power vis-à-vis the remaining states in the system; and (4) states behave as though they are unitary, rational actors (Waltz, 1979; Gilpin, 1981).

Neorealist theories operate at the level of the international system and argue that the distribution of power among the leading states provides the most powerful explanation for patterns of a variety of global outcomes. According to Kenneth Waltz, "[a] system is composed of a structure and of interacting units. The problem . . . is to contrive a definition of structure free of the attributes and interactions of units" (1979:79). Studies of this sort generally define the structure of the international system according to its ordering principle (anarchy or hierarchy), the functional differentiation among states (homogeneous or heterogenous), and the distribution of power among states. Anarchy has been a constant structural feature over time, since the system has always been characterized by the lack of a supranational authority with a monopoly on the legitimate use of force. States have also been functionally homogeneous over time. Structural variations and, hence, variations in patterns of international relations are therefore caused by changes in the distribution of power among the major powers in the system.

Many neorealist conceptions of structure are explicitly microeconomic. They rely on analogies between the structure of markets and industries and that of the international system (Waltz, 1979; Gilpin, 1981:20–21, 85).[2] Just as the behavior of firms in a given industry is influenced by the number of firms and the "size" distribution among them, so too is the behavior of states in the international system influenced by the number of major powers and the distribution of power among them. This leads most neorealists to distinguish among systems characterized by a single preponderant state (hegemonic or unipolar), two dominant states (bipolar), or more than two dominant states (multipolar). Thus, neorealists and many of their critics often measure the distribution of power by counting the number of particularly powerful states relative to the remaining states in the system (Deutsch and Singer, 1964; Waltz, 1964, 1979; Rosecrance, 1966; Hoffmann, 1968; Gilpin, 1975, 1981; Snyder and Diesing, 1977; Posen, 1984; Hart, 1985; Levy, 1985a; Doyle, 1986; James and Brecher, 1988; Midlarsky, 1988; Most and Starr, 1989).[3]

Of course, this is not the only manner in which polarity has been defined. Some scholars, for example, define polarity in terms of coalitions of states, rather than

[2]However, neorealists rely to different degrees on analogies between the structure of markets and industries and the structure of the international system. Gilpin (1981; see also Russett, 1968a:131–137), for example, qualifies the usefulness of this analogy far more than Waltz (1979).

[3]Further, many traditional realists such as Herz (1959), Claude (1962), Wolfers (1962), Knorr (1966), and Morgenthau and Thompson (1985) also define polarity in this manner.

individual states (Singer and Small, 1968; Haas, 1970; Wallace, 1973; Bueno de Mesquita, 1975; Stoll and Champion, 1985).[4] Others define polarity in terms of individual states, but utilize more elaborate methods for measuring this feature of the distribution of power than counting the number of preponderant states (Modelski, 1974; Rapkin, Thompson, with Christopherson, 1979; Wayman, 1984). However, many seminal studies of international relations have argued explicitly that counting the number of poles is the most appropriate technique for measuring the global distribution of power. I will therefore focus on the limitations of measuring the distribution of power solely by counting the number of poles in the international system; and I will demonstrate some of the advantages of analyzing concentration as well as polarity in studies of international relations.

Some Limitations of Polarity

Measuring the distribution of power by counting the number of preponderantly powerful states engenders a number of important problems. First, since it is often unclear precisely which states ought to be counted; in other words, how to distinguish polar powers from other states. Many analysts consider this problem trivial. Waltz, for example, asserts that "[t]he question [of which nations are polar powers] is an empirical one, and common sense can answer it" (1979:131).[5] But there is little consensus regarding whether, for example, either the nineteenth century or the post–World War II era was characterized by hegemony, bipolarity, multipolarity, or some combination of these structural conditions (Snyder and Diesing, 1977; Modelski, 1978; Waltz, 1979; Organski and Kugler, 1980; Gilpin, 1981; Levy, 1985a; Thompson, 1988). These long-standing debates suggest that "common sense" is not a sufficient basis on which to measure the number of poles. And whereas some scholars have attempted to derive more rigorous measures of the number of polar powers in the system, it is clear that considerable disagreement exists among them as to how polarity should be defined, measured, and operationalized.

In addition, analysts do not agree on how to identify changes in the number of poles. As Klaus Knorr argued, the debates that were being waged in the 1960s (and that have yet to be resolved) over whether the system was, or had ceased being, bipolar were "doomed to be rather fruitless, for the concept of bipolarity does not specify or suggest criteria on the basis of which one could specify with which configuration in the real world bipolarity ends and something else begins" (1966:163–164). Indeed, problems surrounding how to determine when changes in the number of poles occur are not limited to discussions of bipolarity, and they continue to hamper efforts to study the effects of polarity (Jervis, 1992:76).

Second, aside from the question of how to measure this feature of the distribution of power, there exists a larger, conceptual issue regarding whether counting the number of poles is consistent with the microeconomic foundations of neorealism. One of the foremost advocates of measuring the system's structure

[4]The assumption that underlies these analyses is that alliances can be treated as behaviorally similar to states. This assumption has been challenged by many critics; and it has become common to distinguish between polarization, which concerns the number and strength of major *alliance blocs* in the system, and polarity, which concerns the number of preponderant *states* in the system(Nogee, 1975; Jackson, 1977; Rapkin, Thompson, with Christopherson, 1979; Waltz, 1979; Wayman, 1984; Hart, 1985; Levy, 1985a; Thompson, 1988; Wayman and Morgan, 1990). Whereas the extent to which polarization is related to patterns of international outcomes is an interesting and important question, the purpose of this paper is to analyze polarity.

[5]At another point, Waltz notes that bipolar systems are distinguished from multipolar systems based on whether a "third power is able to challenge the top two" (1979:98). However, in the absence of some well-defined criteria for determining when this condition is met, it remains difficult to distinguish polar powers from other states.

solely in terms of polarity defends this approach on the grounds that "[m]arket structure is defined by counting firms; international-political structure, by counting states" (Waltz, 1979:98–99).

Economists have, in general, used two measures of market structure. Contrary to the assertions of some neorealists, neither method involves counting the number of leading firms in an industry. First, N-firm ratios of industry structure measure the proportion of profits, output, or other measures of market share possessed by the leading N firms in a given industry (Hannah and Kay, 1977; Scherer, 1979:ch. 3). One study uses a similar method to measure polarity: systems are characterized as bipolar if the two largest states control at least 50 percent of the power capabilities possessed by all major powers; systems are characterized as multipolar if the two largest major powers possess less than 50 percent of these capabilities (Wayman, 1984; see also Wayman and Morgan, 1990).

This method of measuring structure, however, is different from counting the number of preponderant firms or states. N-firm ratios do not count the number of firms; instead, they measure the *aggregate* market share of a *given number* of firms. Similarly, "two-state" ratios do not count the number of poles; rather, they measure the aggregate capabilities possessed by the largest two major powers in the system. As such, classifications of the system's structure based on these ratios may differ considerably from those based on counting the number of poles. For example, a system in which three major powers each possessed 30 percent of the aggregate capabilities possessed by the major powers would be classified as bipolar according to the "two-state" ratio. But if we count the number of poles this system would be classified as tripolar.[6]

Second, economists often measure industry structure based on concentration, since, in addition to the number of leading firms in an industry, "when . . . firms are unequally sized in a given way, the extent of that inequality will also affect performance" (Waterson, 1984:166; Hannah and Kay, 1977; Scherer, 1979:ch. 3; Jacquemin, 1987). In particular, economists often argue that outcomes such as prices, output, and profits are likely to be related both to the number of firms in a given industry *and* to the relative inequality among these firms.[7] Thus, scholars of industrial organization typically maintain that any measure of market structure "should be a one-dimensional measure, incorporating the *two* relevant aspects of industry structure, namely *firm numbers . . . and size inequalities*" (Waterson, 1984:166–167, emphasis added; see also Hannah and Kay, 1977; Scherer, 1979:ch. 3; Jacquemin, 1987).

The preceding discussion suggests that the analogy between measuring structure by counting firms and states is incomplete, at best. To the extent that neorealists wish to use market structure as a metaphor for the structure of the international system, it would seem that they should utilize a measure of the distribution of power that captures both the number of leading states in the system and the power inequalities among them. From this standpoint, one problem with relying solely on the number of poles to measure the distribution of power is that the only dimension of inequality that this measure incorporates is that between polar and nonpolar powers. Hegemony (or unipolarity) is characterized by a "wide" power disparity between the largest state in the system and all other states; bipolarity is characterized by the "approximate" equality of the two largest states and a "wide" power disparity between the smallest pole and any remaining state; and multipolarity is characterized by the "approximate" equality of more than two

[6]This point is developed further under "Some Differences between Concentration and Polarity," below.

[7]However, some of these conclusions have been criticized by students of what Jacquemin (1987) refers to as "the new industrial organization" (see also Hannah and Kay, 1977; Waterson, 1984).

particularly powerful states and a "wide" power disparity between the smallest pole and any other state in the system. Defined in this manner, polarity provides no information regarding the level of inequality between (among) polar powers or nonpolar major powers (Levy, 1985a; Thompson, 1988).

Two Underlying Assumptions of Polarity

Since measures of polarity that rely on counting poles do not capture the number of major powers or the inequalities of power among them, we must either assume that these aspects of the distribution of power are unimportant or utilize additional measures that incorporate these structural features. As I argue below, in certain important cases, assuming away the importance of these variables is not likely to be as fruitful a strategy as following the latter course of action.

Scholars who rely exclusively on counting the number of poles to measure the distribution of power assume that the poles do not differ markedly in their power potential, that is, that they are structurally equivalent. Most neorealists agree that

> [i]n a multipolar system there are several (more than two) "Great Powers" whose military power is roughly equal, and whose rivalry and cooperation dominate politics in the system. In addition, there are, of course, a number of smaller states who do not play a significant role except as they serve as objects of the Great Power competition or create disturbances among themselves that engage the Great Powers. A bipolar system is one with only two Great Powers and a number of smaller states. (Snyder and Diesing, 1977:419–420)

This definition of polarity suggests that the distribution of power among the poles is roughly uniform. But the *degree* to which this is the case is an issue that is rarely addressed by neorealists. In fact, polar powers often are not equally powerful, which (as I indicate below) is of considerable theoretical importance (Wagner, 1986; Thompson, 1988:ch. 9; Mearsheimer, 1990).

Scholars who utilize only the number of poles to measure the distribution of power also assume that major powers that are not polar powers do not influence the structure of the system. By most neorealists' criteria, this means that we should, for example, discount heavily the importance of China, France, or Great Britain in any systemic study of international relations since the conclusion of World War II. Whereas, by most standards, these states have not been as powerful as the United States or the Soviet Union during this period, it seems unnecessarily restrictive to exclude them from such an analysis. A variety of studies argue that these states have been major (though not polar) powers during the postwar era (Singer, Bremer, and Stuckey, 1972; Small and Singer, 1982; Levy, 1983), and empirical research has linked the number of major (polar, as well as nonpolar) powers to global outcomes such as the onset of war (Ostrom and Aldrich, 1978; Levy, 1984) and the level of international trade (Mansfield, 1992a). Moreover, as I argue below, there is also reason to believe that the relative size of nonpolar major powers may have a strong influence on a variety of international outcomes. Neglecting nonpolar major powers in neorealist analyses is therefore likely to lead to a much cruder description of the distribution of power than would otherwise be the case and to reduce our ability to explain many global outcomes.

Concentration

Under certain circumstances, the assumptions discussed in the previous section may be warranted. However, I argue that for the purposes of analyzing a variety of important outcomes in the international arena, a more fruitful tack is to measure

directly both the number of major (as well as polar) powers and the relative inequality of power among these states. There is a well-known index (Ray and Singer, 1973) that accomplishes this task:

$$CON_t = \sqrt{\frac{\sum_{i=1}^{N_t} (S_{it})^2 - 1/N_t}{1 - 1/N_t}}, \quad (1)$$

where S_{it} is the proportion of the aggregate capabilities possessed by the major powers that major-power i controls in year t, and N_t is the number of major powers in the system in year t. CON_t is therefore a continuous index that takes on values ranging from 0 to 1 and that measures the aggregate inequality of capabilities among all of the major powers in the system.

A recent study (Mansfield, 1992b) has pointed out that the level of concentration is a function of: (1) the number of major powers in the global system; and (2) the relative inequality of capabilities among the major powers. In particular,

$$CON_t = \frac{V_t}{\sqrt{N_t - 1}}, \quad (2)$$

where V_t is the coefficient of variation (standard deviation divided by the mean) of S_{it} in year t. Holding constant N_t, the number of major powers in the international system, CON_t is proportional to V_t, the relative inequality of capabilities among the major powers.

It is clear that CON is similar to the measures of industrial concentration used by microeconomists, since it is a one-dimensional index that is a function of the number of major powers (N) and the relative inequality of capabilities among the major powers (V).[8] Among economists, the Hirschman-Herfindahl index is one of the most commonly used measures of this sort; and, if the number of major powers is known, CON can be expressed in terms of this index (Ray and Singer, 1973; Taagepera and Ray, 1977).[9] Polarity, as it is conventionally defined, does not

[8]This is not to imply that CON is the only index of global structure that is consistent with measures of industry and market structure. As Taagepera and Ray (1977) point out, a number of related measures of this sort might also be useful in analyses of international relations (see also footnote 9). But since these measures have received very little attention among scholars of international relations, and since they possess many of the same desirable properties as CON (Taagepera and Ray, 1977), I will focus on CON in my analysis of the distribution of power.

[9]In particular, the Hirschman-Herfindahl index is as follows:

$$HH_t = \sum_{i=1}^{N_t} S_{it}^2 .$$

(For the original derivation of this index see Hirschman ([1945] 1980:xviii–xx, 87–88, 157–162).) Hence,

$$CON_t = \sqrt{\frac{HH_t - 1/N_t}{1 - 1/N_t}} .$$

It is clear that HH takes on values from 1/N to 1, while CON takes on values from 0 to 1. When each major power possesses exactly the same proportion of the total capabilities possessed by the major powers, HH = 1/N and CON = 0; when one major power monopolizes the total capabilities possessed by the major powers, HH = CON = 1; and, when neither of these conditions obtain, $1/N < HH < 1$ and $0 < CON < 1$. Thus, the primary difference between these indices is that CON is less sensitive than HH to the size of N, since the lower bound of CON is 0, while the lower bound of HH is 1/N (Ray and Singer, 1973; Taagepera and Ray, 1977).

It should be noted that, although HH has been a particularly popular measure of market and industry structure, economists have also used a number of alternative measures of this sort (*e. g.*, Theil, 1967; Hannah and Kay, 1977). However, many of these measures are closely related to HH and, hence, to Ray and Singer's (1973) index of concentration (Taagepera and Ray, 1977).

capture either of these features. It measures only the number of preponderant (rather than all) major powers and provides no information regarding relative power inequalities, except for those between polar and nonpolar states.

Moreover, many neorealist definitions of the structure of the global system point to the importance of utilizing concentration to measure the distribution of power. For example, Glenn Snyder and Paul Diesing argue that "the 'structure' of an international system is defined by the *number* of major actors in the system and the *distribution of military power and potential among them*" (1977:419). Similarly, Robert Gilpin maintains that the system's structure is determined by "[t]he number of states and the distribution of capabilities among them" (1981:88; see also Russett, 1968a:131–133; Mearsheimer, 1990). Each of these influential and important studies uses polarity, defined as the number of preponderant states in the system, to measure the distribution of power. But the fact that neorealists are often concerned with the relative inequality of power among the leading states in the system, as well as the number of major powers, suggests that it will not suffice to measure global structure merely by counting the number of poles. In addition to polarity, many neorealist definitions of structure highlight the importance of analyzing concentration.

Some Differences between Concentration and Polarity

We would expect the number of poles and the level of concentration to be at least loosely related, yet it is important to recognize that there are important conceptual and empirical differences between these features of the system's structure. For example, consider a bipolar distribution of power that is, a system characterized by two approximately equally powerful states, each of which is considerably more powerful than any remaining state in the international system. The level of concentration will increase if, holding constant the number of major powers (N) and the capabilities of all but the two largest major powers, the relative inequality of power between the two polar powers (and, hence, V) increases. Since if this relative disparity of power between them becomes sufficiently wide the system will also become unipolar (or hegemonic), there are circumstances under which the level of concentration will be related to the number of poles in the system.

But the level of concentration will also increase if, holding constant the number of major powers (N) and the capabilities of all but one "small" nonpolar major power, this major power's capabilities decline relative to the other major powers in the system (since this will also increase V). In addition, the level of concentration will increase if, holding constant the relative inequality of power among the major powers (V), the number of major powers in the system decreases because this "small" nonpolar state no longer qualifies as a major power.[10] In neither of these cases would a change in concentration be associated with a change in the number of poles.

The six hypothetical systems shown in Table 1 help to illustrate further some of the conceptual differences between the number of poles and the level of concentration. Each system is comprised of five major powers, the two smallest of which (D and E) possess 10 percent of the aggregate capabilities possessed by the major powers. If we define a polar power as any state that controls at least 50 percent of the largest state's proportion of the aggregate capabilities possessed by the major powers,[11] states A, B, and C are polar powers in Systems 1, 2, and 3; and

[10]This is the case only if $V > 0$.

[11]See Schweller (1993) for a similar definition of a polar power.

TABLE 1. Shares of major-power capabilities and levels of concentration in six hypothetical systems comprised of five major powers.

	Multipolar					
	Major Power					
	A	*B*	*C*	*D*	*E*	*CON*
System 1	.267	.267	.266	.100	.100	.206
System 2	.350	.270	.180	.100	.100	.244
System 3	.400	.200	.200	.100	.100	.274
	Bipolar					
	Major Power					
	A	*B*	*C*	*D*	*E*	*CON*
System 4	.370	.250	.180	.100	.100	.254
System 5	.400	.240	.160	.100	.100	.281
System 6	.350	.350	.100	.100	.100	.306

states A and B are polar powers in Systems 4, 5, and 6. Thus, in terms of the number of poles, Systems 1–3 are structurally equivalent: each is comprised of two major, and three polar, powers. Similarly, Systems 4–6 are structurally equivalent: each is comprised of three major, and two polar, powers. It is clear, however, that in terms of their levels of concentration, neither set of systems is structurally equivalent. The level of concentration rises as the relative inequality of capabilities among states A, B, and C becomes more extreme. At least in this case, therefore, concentration provides additional information about, and a more nuanced description of, the distribution of capabilities than would be obtained by referring only to the number of poles in the international system.

This example also points out that the number of poles need not move in tandem with the level of concentration. The level of concentration in System 3 exceeds that in System 4, even though the former is multipolar and the latter is bipolar, based on my working definition of polarity. Further, according to another definition of polarity (Modelski, 1974; Rapkin, Thompson, with Christopherson, 1979; Thompson, 1988), System 2 is bipolar and System 5 is multipolar.[12] Based on yet another definition (Wayman, 1984), all of the six systems are bipolar. Since the level of concentration need not be directly related to the number of poles, analysts should be hesitant to utilize these variables interchangeably.[13]

[12]This definition is as follows:

1. in a unipolar system, one state controls 50 percent or more of the relative capabilities that matter;
2. in a bipolar system, two states control at least 50 percent of the relative capabilities and each of the two leading actors possess at least 25 percent with no other controlling as much as 25 percent;
3. in a multipolar system, three or more states each control at least 5 percent of the relative capabilities but no single state controls as much as 50 percent and no two states have as much as 25 percent apiece. . . .

1b. in a two actor unipolar system, one state controls 76 percent or more of the relative capabilities that matter[; . . .]

1c. in a near-unipolar system, one state controls more than 45 percent but less than 50 percent of the relative capabilities and no other state possesses as much as 25 percent. (Thompson, 1988:209–210; see also Modelski, 1974; Rapkin, Thompson with Christopherson, 1979)

[13]See Wayman and Morgan (1990) for an empirical comparison of concentration and various measures of polarity that arrives at much the same conclusion.

But the potential divergences between these variables do not pose serious problems for analysts of international relations. On the contrary, using both features of the distribution of power in conjunction with one another generates a much richer description of the system's structure than can be obtained by focusing exclusively on either variable. This research strategy permits analysts to distinguish among systems characterized by the same number of poles but different levels of concentration; it also permits analysts to distinguish among systems characterized by the same level of concentration but different numbers of poles. However, some scholars suggest that this tack is hazardous, since theories of the distribution of power center only on the number of poles, not on concentration. Waltz, for example, asserts that previous studies of the effects of concentration "mention no theory that employs [the concentration of capabilities] and I know of none that does. The well-known theories dealing with these matters refer to numbers of great powers or to polarities" (1979:15).

Waltz is correct in asserting that there is rarely any fully articulated explanation of why concentration should be used to measure the distribution of capabilities in studies of this sort. But he is incorrect in suggesting that leading theories of international relations do not highlight features of the structure of the system that are measured better by concentration than by polarity. In the following sections I review a number of leading theories of international politics and the international political economy that point to the importance of using both the number of poles and concentration to measure the international distribution of power.

The Distribution of Power and Balancing Behavior

Virtually no theory of international relations has generated as much interest for as long a period of time as balance-of-power theory. Balance-of-power theory is actually a set of related theories, operating at different levels of analysis and explaining a variety of different outcomes in the international arena. In this paper, I analyze two of the most prominent variants of this theory.

The first seeks to explain the manner in which balances of power are generated in the international system. On this score, Waltz argues that one of the most enduring tendencies in international politics is for balances of power to form among states or groups of states. The "defining difference" among various types of systems is the manner in which poles engage in balancing one another. As he notes:

> [b]alancing is differently done in multi- and bipolar systems. . . . Where two powers contend, imbalances can be righted only by their internal efforts. With more than two, shifts in alignment provide an additional means of adjustment, adding flexibility to the system. This is a crucial difference between multi- and bipolar systems. (1979:163; see also Posen, 1984:62–64).

Thus, balancing in bipolar systems is achieved through means internal to the two superpowers; poles in multipolar settings must rely on external sources (*i. e.*, alliances) to bolster their security.

This argument is most persuasive when *one particular type* of bipolar system obtains. In a situation that approximates System 6 in Table 1, it is likely that the two poles will be large enough to offset internally any minor imbalances between them that might occur. And smaller states are unlikely to possess the strength necessary to tilt the balance too far in favor of either superpower by shifting their alignments. However, whereas many analysts seem to believe that this is the only type of bipolar system that needs to be considered, a situation characterized by two states that are approximately equally powerful and far stronger than any remaining state is not the only system of this sort that could arise.

Concentration and Balancing Behavior

The logic of Waltz's argument weakens as the disparity in power between the two poles widens and the remaining states become more powerful relative to the poles. We might, for example, expect that bipolar systems that approximate Systems 4 or 5 in Table 1 would be likely to exhibit tendencies toward external balancing behavior on the part of state B, the smaller of the two poles. The combination of states B and C can balance state A, and by virtue of its size relative to state A, state B is unlikely to be able to balance state A through internal means alone.

This suggests that the level of concentration may exert a substantial impact on the means by which states engage in balancing. In bipolar systems that are also highly concentrated (such as System 6 in Table 1), we would expect polar powers to rely on internal means for this purpose. Though this type of system is what many observers seem to have in mind when they refer to bipolarity, it is a very restrictive definition of this structural condition and may fail to describe many systems characterized by the existence of two poles. It is far from clear that *all* systems in which only two poles exist will be characterized exclusively by internal balancing behavior on the part of both poles.

Concentration may also help to explain aspects of balancing behavior in multipolar systems. Waltz argues that one of the dangers inherent in a multipolar system is that alliance partners will fail to come to the aid of an aggrieved party. The extent to which "buck-passing" will characterize alliance politics under these circumstances depends, according to Waltz, "on the *size of the group and the inequalities within it*, as well as on the character of its members" (1979:165; emphasis added).[14] Thus, Waltz explicitly notes the importance of relative inequalities in determining alliance behavior in multipolar systems. Ignoring power inequalities within multipolar systems may serve to obscure differences in the extent to which buck-passing is likely to occur.

Barry Posen seems to recognize the problem of examining the influence of the distribution of power on global outcomes in the absence of some measure of the relative inequality of power. He points out that

> [t]he question of relative capabilities among great powers is less often addressed by balance of power theorists. Theory is facilitated by simplifying reality. It is possible to generate relatively clear and explicit hypotheses about behavior in systems of either several equal powers (multipolarity) or two equal powers (bipolarity). It would be quite difficult to generate such hypotheses about the myriad real-world variations that could occur in the relative capabilities of two or more major powers. (1984:64)

Posen's solution to this problem suggests that analysts should ignore inequalities among polar, and major, powers and/or assume that they are unimportant for the purpose of explaining balancing behavior (and other outcomes).

I have suggested that both of these strategies are problematic: relative inequalities among polar, and major, powers may have an important impact on the means that states utilize to balance one another. Indeed, a number of formal analyses have explicitly considered the effects of both the number of major powers and the inequality among them on alliance patterns and have found that these structural factors are of substantial importance (Wagner, 1986; Niou, Ordeshook, and Rose, 1989; Niou and Ordeshook, 1990; see also Russett, 1968b; Zinnes, 1970). These findings suggest that, rather than relying solely on the number of poles, concentration be introduced into such an analysis in order to provide another

[14]On problems of buck-passing, see Posen (1984) and Christensen and Snyder (1990).

piece to the structural puzzle, one that can be used to generate more refined hypotheses regarding balancing behavior and alliance patterns. Considering the effects of both the number of poles and concentration is therefore likely to enhance substantially the explanatory power of realist and neorealist analyses of balancing behavior, almost all of which have centered exclusively on polarity.[15]

The Distribution of Power and the Onset of War

A second variant of balance-of-power theory posits that the distribution of power among the major powers helps to shape the circumstances under which wars involving these states are likely to begin. Wars, according to some balance-of-power theorists, are less likely to occur when power is balanced among the major powers than when it is imbalanced. For example, Arnold Wolfers argues that "from the point of view of preserving the peace . . . it may be a valid proposition that a balance of power placing restraint on every nation is more advantageous in the long run than the hegemony even of those deemed peace-loving at a given time" (1962:120). Similarly, Inis Claude maintains that

> it [is] wholly proper to evaluate the balance of power system in terms of its effectiveness in producing such management of the power situation as is necessary to prevent war. . . . The world could do much worse than manage the power relations of states so as to keep the major contestants in a position of approximate equality. There is danger when power confronts power, but there is even greater danger when power confronts weakness. (1962:55, 62)

Theories of this sort generally focus on the deterrent role played by potential blocking coalitions. Systems characterized by a (relatively) uniform distribution of power are likely to experience the onset of few wars (relative to imbalanced systems), since this condition gives rise to a variety of potential coalitions, each of which is able to thwart aggression on the part of any state (or small group of states). As Quincy Wright argues, "[t]he balance of power is a system designed to maintain a continuous conviction in every state that if it attempted aggression it would encounter an invincible combination of the others" (1965:254; see also Toynbee, 1954; Gulick, 1955; Herz, 1959; Claude, 1962; Morgenthau and Thompson, 1985). States have an incentive to block the aggressor in order to avert the possibility that victory on its part will undermine their security vis-à-vis the initiator. And this has the effect of increasing the expected costs of initiating a war relative to the expected benefits and, hence, deterring states from doing so.

Wars, according to this variant of balance-of-power theory, are the products of power inequalities among the leading states in the system. They are one of the principal instruments that are used to "repel a bid for hegemony" and to restore a balance of power among the major powers (Claude, 1962:59; see also Toynbee, 1954; Wolfers, 1962; Wright, 1965).[16]

This explanation is often invoked to help explain the relative success of the Concert of Europe system in averting major-power war. Statesmen believed in the importance of raising the expected costs of waging war by institutionalizing mechanisms for the formation of blocking coalitions in the event of aggression;

> [b]ut they also believed that there should be such an equilibrium of forces among the major powers as to discourage such attempts. . . . In general, the eighteenth century . . . equilibrium had, in their view, been too loosely defined and *too full of*

[15]For some exceptions see Cusack and Stoll (1991), Lalman and Newman (1991), and Schweller (1993).

[16]For excellent reviews of this literature see Levy (1985b, 1989).

> *dangerous imbalances.* . . . Under their leadership, therefore, the negotiators at Vienna went through enormous efforts to adjust territory, resources, and population as equitably as possible among the major powers. (Craig and George, 1983:30; emphasis added)

Similarly, Wolfers points out that peace was usually preserved during this era because "in order to render impossible, *or to defeat,* any incipient hegemony, two or more powers could be counted upon to line up almost intuitively against any power that threatened to become their superior" (1962:122; emphasis added).

A similar line of argument is often used to explain the relative absence of major-power war during the latter portion of the nineteenth century and the beginning of the twentieth century. F. H. Hinsley, for example, notes that this period was characterized by a relatively uniform distribution of power among the major powers, and that consequently, "even in extra-European contexts, still more within Europe itself, all were restrained from rash activity—from fighting each other, from formal war with other states, from gains for themselves which could not be counterbalanced by gains for the others" (1963:254). And Claude maintains that "[t]he period most often cited as the classic era of peace-through-equilibrium, the happy century between the Napoleonic Wars and World War I, actually demonstrated the peace-preserving effect of the *threat of a preponderantly powerful coalition*" (1962:59; emphasis added).

Concentration and the Onset of War

Much of the literature on the relationship between the distribution of power and the onset of war centers on whether wars are more likely to begin under conditions of bipolarity or multipolarity (Rosecrance, 1963, 1966; Deutsch and Singer, 1964; Waltz, 1964). But balance-of-power theorists often suggest that when *power inequalities exist among the major powers,* war becomes particularly likely. As a result, both the number of poles and the level of concentration may shape the conditions under which wars are most likely to begin.

To see why this is the case, consider System 1 in Table 1, in which states A, B, and C possess (virtually) identical proportions of the system's capabilities. In this system, balance-of-power theory predicts the relative absence of war. Compare this system with System 3 in Table 1, which is characterized by the existence of one state (A) which is disproportionately powerful. Both systems are tripolar; but balance-of-power theorists often imply that the latter should be considerably more prone to the onset of war than the former, since deterrence is enhanced as the number of possible blocking coalitions increases and since fewer potential coalitions are likely to exist as the distribution of capabilities becomes increasingly asymmetrical.

However, to determine the number of states (or coalitions) that can block an aggressor (or coalition of aggressors), we need to know the precise distribution of capabilities among the relevant states—not merely the number of approximately equally powerful states. As one study of alliance formation concludes, "it appears reasonable to expect that the relative power positions of the members [of a group] *will* affect their coalition-forming behavior" (Russett, 1968b:290; see also Zinnes, 1970; Gilpin, 1981:88; Wagner, 1986; Niou, Ordeshook, and Rose, 1989; Niou and Ordeshook, 1990). It is clear that concentration provides more information than the number of poles about the relative power positions of the major powers and, hence, about the coalitions among them that are likely to form. Moreover, the factors that are measured by concentration, but not by polarity, are explicitly highlighted by both balance-of-power theorists and their critics.

A variety of balance-of-power theorists emphasize the importance of the relative inequality of power among the major (as well as polar) powers in their explanations of war. John Herz (1959:154; see also Claude, 1962), for example, argues that

war is most likely to begin when there exists a "slight imbalance" among the major powers. In the same vein, Wolfers maintains that, throughout the nineteenth century, "[a]gain and again, a country believing it had attained a position of superiority struck out against its rivals, or another country fearing an increasingly adverse balance initiated war before the balance had tilted too far against it" (1962:122). Similarly, John Mearsheimer argues that wars prior to 1945 were the products of both "multipolarity and *the imbalances of power that often occurred among the major states in that multipolar system*" (1990:11; emphasis added).

Another group of studies also addresses the effects of the number of major powers and the inequalities of power among them on the onset of war, but concludes that, contrary to balance-of-power hypotheses, "near-preponderant" systems (*i. e.*, systems in which one state controls exactly half of the total capabilities) are least prone to the outbreak of certain types of wars (Wagner, 1986; Niou, Ordeshook, and Rose, 1989; Niou and Ordeshook, 1990).[17] Like many balance-of-power theorists, however, they maintain that there will be considerable differences in the likelihood of these wars across systems that are not near-preponderant. If we rely solely on the number of poles to measure the distribution of capabilities, we are therefore unable to capture the structural variations that both balance-of-power theorists and many of their critics point to in explaining the onset of war. Supplementing the traditional realist and neorealist focus on polarity with an analysis of concentration better enables us to capture these relatively subtle variations in the distribution of power.

A considerable amount of valuable empirical research has been conducted on the relationship between the concentration of capabilities and/or the number of poles on the one hand, and aspects of war on the other.[18] The number of poles does appear to be related to patterns of certain types of wars. For example, if, as some scholars have argued, the period after World War II has been the only period of bipolarity in modern times (Snyder and Diesing, 1977; Waltz, 1979),[19] then no wars between bipolar powers have occurred. It is also clear that many wars occurred among polar powers during the multipolar era, which—many analysts argue—preceded this period. However, concentration often seems to provide insights above and beyond those provided by the number of poles into the conditions affecting the frequency of war. For example, from 1820 to 1965, there is evidence that concentration is related to the frequency of wars involving major (as opposed to only polar) powers (Mansfield, 1992b, forthcoming).

In particular, wars begin most frequently when concentration is at an intermediate level, that is, when the system is characterized by a "moderate" degree of imbalance among the major powers. But both low and intermediate levels of concentration characterized the period prior to World War II, and relatively high levels of concentration characterized the period afterward. To the extent that many scholars agree that the former period was multipolar, various multipolar distributions of capabilities seem to be associated with the incidence of war in markedly different manners. This suggests that, by itself, polarity, as it is conventionally defined, is often conceptually too crude to provide us with much relevant information about the international distribution of power. This argument

[17]On this point, see also Modelski (1978), Organski and Kugler (1980), and Gilpin (1981).

[18]See, for example, Singer, Bremer, and Stuckey (1972), Cannizzo (1978), Bueno de Mesquita (1981), Maoz (1982), Thompson (1983, 1988), Wayman (1984), Levy (1985a), Sabrosky (1985), Stoll and Champion (1985), Modelski and Thompson (1988), Bueno de Mesquita and Lalman (1988), Midlarsky (1988), Spiezio (1990), and Boswell and Sweat (1991). For studies of concentration among alliance blocs see Bueno de Mesquita (1975) and Stoll (1984).

[19]As noted above, however, many scholars have argued that this is not the case. On this point, see also Hopf (1991).

may also help to explain why one study found that, during this period, concentration exerted a far stronger influence on the frequency of major-power wars than did the number of poles (Mansfield, forthcoming).[20]

In light of the importance that many structural theories of international politics attach to the relative inequality of power among all of the major powers, it is surprising that some neorealists dismiss the use of concentration on the grounds that it is incompatible with existing explanations of this sort. The use of concentration is not only consistent with the arguments that underlie many of these theories, it possesses properties that often render it more useful than the number of poles in this regard. And, for the purposes of explaining the onset of many types of wars, empirical findings indicate that the influence of concentration is at least as important as the effect of the number of poles. Hence, there is good reason to believe that broadening their conventional focus on the number of poles by considering the impact of concentration will enhance considerably realists' and neorealists' analyses of war; and that, unless this research strategy is chosen, analysts are likely to underestimate the impact of the distribution of power on the onset of many types of wars.

Moreover, the advantages of using concentration to measure the distribution of power are not restricted to the study of international politics. In the following section I consider the merits of examining concentration in analyses of the international political economy.

The Distribution of Power and the International Political Economy

Many analyses of the international political economy have centered on the issue of whether the existence of a single preponderant state is necessary for the coordination of global economic relations. Hegemonic stability theorists argue that this is the case (Kindleberger, 1973, 1981; Gilpin, 1975, 1981, 1987; Krasner, 1976; Lake, 1983, 1988). Central to some variants of this theory is the argument that the establishment and maintenance of a liberal economic order is fraught with collective action problems. The existence of a hegemon, which acts as a privileged group in providing collective goods, is a necessary (though it need not be a sufficient) condition for such a system to obtain. Though they have not arrived at a consensus regarding either how much emphasis to place on the provision of collective goods in the international arena or why hegemons provide collective goods,[21] hegemonic stability theorists agree that the existence of a hegemon is the most salient explanation for the relatively liberal economic systems that characterized much of the nineteenth century and the period after the conclusion of World War II.[22] They also agree that the inability of Great Britain to provide global leadership and the unwillingness of the United States to do so helped to set the stage for the Great Depression of the 1930s.

Most variants of this theory focus on the effects of the inequality of power between the strongest state and each remaining state in the system. When the disparity is sufficiently wide, the system is characterized by hegemony; when it is not, no hegemon exists. At first glance, it seems entirely appropriate for

[20]However, this study also found that both the number of poles and the level of concentration were strongly related to the incidence of interstate wars that did not involve major powers (Mansfield, forthcoming).

[21]Kindleberger (1973, 1981), for example, implies that hegemons provide collective goods for altruistic reasons; whereas Gilpin (1975, 1981, 1987), Krasner (1976), and Lake (1988) argue that they do so out of self-interest.

[22]A related argument is advanced by Spiro (forthcoming), who emphasizes variations in the nature of power that hegemons exercise as their position changes relative to the remaining states in the system.

hegemonic stability theorists to measure the structure of the system solely in terms of the number of poles. Since the primary distinction that they draw is between systems that are dominated by one state and systems that are not, the degree of inequality among polar (or all major) powers does not appear to be at issue. However, there are a variety of problems associated with using hegemony to measure the structure of the system that can be reduced by supplementing this focus with an analysis of concentration. Using concentration to measure the distribution of power also allows us to test the competing claims made by hegemonic stability theorists and many of their critics.

The Distribution of Power and the Provision of Collective Goods

Hegemonic stability theorists often rely on the theory of collective action to explain patterns of the international political economy. According to the original architect of this theory (Olson, 1971), since the benefits derived from the provision of a collective good accrue to group members in proportion to their "sizes," the larger the dominant member of a group, the more of any collective good this member will provide. Hegemony is generally thought to be associated with the greatest amount of international economic coordination because, in the absence of selective incentives, the provision of any collective good will approach an optimal level only when a privileged group exists. Hegemons, by virtue of their disproportionate sizes, will provide more leadership and coordination in the international economy than smaller states; and, in the absence of a preponderant state, there is little prospect that collective goods of this sort will be provided.

Because they generally distinguish only between hegemonic and nonhegemonic systems, some hegemonic stability theorists imply that the relationship between the distribution of capabilities and trade is characterized by a step function. Little international economic coordination is possible in the absence of a hegemon; and high degrees of coordination are possible only in the presence of a hegemon. But Mancur Olson (1971) and others imply that a continuous relationship exists between the degree of relative inequality in a group and the amount of a collective good that is provided. The theory of collective action therefore suggests that there may be considerable variations among different nonhegemonic systems in the degree of international economic coordination. If we rely only on hegemony to measure the distribution of power, it is not possible to account for these potential variations.

This point has not escaped the attention of some hegemonic stability theorists. Although he does not emphasize the importance of collective action problems in the international political economy, Stephen Krasner (1976) does emphasize the variations in the structure of the international trading system that are likely to result from different nonhegemonic distributions of power. Krasner maintains that, like a hegemonic system, "a system comprised of a large number of small, highly developed states . . . is [also] likely to lead to an open international trading structure" (1976:321). The systems that he maintains will be characterized by closure are those that are "composed of a few very large, but unequally developed states" (1976:321).

Similarly, David Lake points out that "[t]he theory of hegemonic stability, perhaps due to its focus on the absence or presence of hegemony, has failed to develop the analytic tools necessary to comprehend adequately the interests and policies of all countries within the international economy" (1983:521, 1988).[23] For

[23]The importance of distinguishing among various nonhegemonic distributions of power has also been emphasized by some critics of hegemonic stability theory. See, for example, Keohane (1984:39).

Lake, the relative sizes of "middle-sized countries," as well as hegemons, exert a substantial impact on the structure of the international system and, hence, on outcomes in the international political economy. Krasner and Lake point to the importance of different sets of factors in explaining outcomes in the global trading system, but both seem to agree that markedly different types of commercial systems will obtain depending on the particular nonhegemonic distribution of power that exists. And since the use of concentration allows analysts to distinguish among various nonhegemonic systems, it is likely to explain variations in international economic outcomes that hegemony cannot explain.

Another criticism that is often voiced about hegemonic stability theory is that this theory ignores one of the central insights offered by the theory of collective action: namely, the importance of group size—that is, the number of members in a group—(as well as the degree of relative inequality among members of the group) in determining the extent to which collective goods will be provided. According to Olson, the degree to which groups are able to overcome collective action problems is inversely related to the size of the group. The fact that they generally underemphasize group size, and the fact that small (or k), as well as privileged, groups may be able to provide collective goods, form the basis of many of the critiques that have been leveled against hegemonic stability theorists. Small-group theorists posit that because, in addition to privileged groups, small groups are often able to provide collective goods, international economic coordination may be possible if there exists a few (approximately) equally sized states, each of which is interested in the creation and/or maintenance of a liberal economic regime (Keohane, 1984; Lipson, 1984; Axelrod and Keohane, 1985; Oye, 1985). But while these theorists emphasize the importance of group size, they have generally ignored the effects of power inequalities among group members.

Hence, hegemonic stability theorists emphasize the importance of relative power inequalities among major powers; whereas small-group theorists tend to highlight the importance of group size in their respective analyses of the international political economy. Each set of scholars therefore focuses on one important aspect of the theory of collective action, while giving short shrift to a second dimension. Olson argues that "*in small groups marked by considerable degrees of inequality*—that is, in groups of members of unequal 'size' or extent of interest in the collective good—there is the greatest likelihood that a collective good will be provided" (1971:34; emphasis added). To the extent that the global system is beset by collective action problems, this suggests that both the number of major powers and the relative inequality of power among them may influence the degree to which collective goods are provided in the international political economy.[24]

Focusing on concentration, in addition to hegemony, provides a way to help resolve some of the debates between hegemonic stability and small-group theorists, since we can compare the relative importance of both "group" size (N) and relative power inequalities (V), as well as hegemony, on patterns of international economic relations. In addition, Olson suggests that these variables may have an interactive impact. And there has been sporadic interest in the effect of the interaction between these variables on outcomes in the international political economy (Russett and Sullivan, 1971; Snidal, 1985a, 1985b), although few studies of this sort have been conducted. By focusing on concentration, it is possible to assess empirically the influence of some aspects of the interaction between the number of major powers and the relative inequality of power among them on international economic outcomes.

[24]This point is also relevant to the earlier discussion of alliance patterns and balancing behavior in multipolar systems.

Not only is using concentration to measure the distribution of power consistent with both hegemonic stability theory and many alternative explanations of the international political economy, this approach also helps to resolve some important problems that are courted by defining the structure of the system exclusively in terms of hegemony. For example, hegemonic stability theorists have been criticized for failing to determine the criteria by which hegemonic and nonhegemonic systems should be distinguished (McKeown, 1983; Russett, 1985). Concentration is a continuous measure, which allows us to examine the effects of different nonhegemonic distributions of capabilities on trade, and mitigates the problem of how to distinguish between discrete structural conditions, such as the number of poles in the system.

Measures of Market Power in the International Political Economy

Critiques of hegemonic stability theory based on small-group theory suggest that no strong relationship exists between hegemony and economic openness, since small, as well as privileged, groups can provide collective goods. Other critics of this approach reject the notion that collective goods exist in the international political economy, because "goods" such as a free trade regime fail to meet the criterion of nonexcludability. Further, some analysts argue that hegemons have an economic incentive to depart from liberal trade policies, since states with sufficient market power to influence world prices can improve their terms of trade by imposing an optimal tariff (Conybeare, 1984, 1987). This suggests not only that hegemony is related to whether the trading system is open or closed, but that, contrary to the predictions of hegemonic stability theory, the existence of a preponderant state will lead to a more closed system than the absence of such a state.

Missing from this argument, however, is the acknowledgement that in addition to hegemons, nonhegemonic states may also possess substantial market power (Lake, 1988:38; Mansfield, 1992a). If we distinguish only between hegemonic and nonhegemonic systems, we cannot assess the differential amounts of market power that exist in systems characterized by various nonhegemonic distributions of power. Using concentration to measure the system's structure helps to alleviate this problem.

In fact, a number of scholars have argued that analyses of market power would benefit from the use of a measure of global concentration. John Conybeare, for example, maintains that, for the purposes of measuring a hegemon's market power, the "Herfindahl index would be the best index of hegemony, since it would discriminate between situations where a country faced a large number of small powers or a small number of medium-sized countries" (1987:287, note 4). As pointed out above, both concentration and the Hirschman-Herfindahl index are measures of market power. But neither index is technically a measure of hegemony, since both measure the distribution of power among all of the major powers—not only the two most powerful states. It is precisely for this reason that concentration is a more comprehensive measure of aggregate market power than hegemony and therefore ought to be used in conjunction with hegemony in studies of this topic (Mansfield, 1992a). Hegemons are not uniquely able to impose optimal tariffs: large nonhegemonic states may also possess considerable market power vis-à-vis the remaining states in the system. Thus, hegemonic and nonhegemonic systems characterized by different levels of concentration may lead to very different patterns of outcomes in the international political economy.

As in studies of war, empirical evidence suggests that concentration is an important determinant of outcomes in the international political economy. Although there is little support for the position that a monotonic relationship

exists between the level of concentration and the level of international trade (McKeown, 1991), the available evidence indicates that a U-shaped relationship does exist between these variables—and that the relationship between hegemony and trade is highly sensitive to how hegemony is measured and operationalized (Mansfield, 1992a). The fact that a U-shaped relationship exists between concentration and commerce indicates that the level of global trade is greatest when the level of concentration is both highest and lowest, while the level of global trade is minimized when the level of concentration approaches an intermediate level. But both low and intermediate levels of concentration are likely to be nonhegemonic.[25] Thus, analysts who rely solely on hegemony to measure the system's structure may fail to account for potentially marked differences in the relationships between various nonhegemonic distributions of power and outcomes in the international political economy.

Since concentration incorporates the structural features emphasized by both hegemonic stability theorists and many of their critics, it is surprising that so little attention has been devoted to concentration in systemic analyses of the international political economy. Indeed, aside from the studies discussed above, no research (that I am aware of) has been conducted on this topic.[26] Concentration is particularly well suited for the task of examining the relationship between the distribution of capabilities and outcomes in the international political economy. Analyzing it in conjunction with hegemony seems likely to provide insights into the structural correlates of commerce that cannot be garnered by focusing on hegemony alone.

Conclusions

Scholars often rely on counting the number of poles to measure the international distribution of power. In this paper, I have argued that, for the purposes considered here, it is often useful to supplement this approach with a focus on concentration. The use of concentration is entirely consistent with the microeconomic foundations of neorealist theories. Indeed, it is more in keeping with commonly used measures of industry structure than is the number of poles.

Moreover, the drawbacks of relying exclusively on the number of poles are not confined to the analytic foundations of neorealism. The only dimension of the inequality of power that polarity, as it is conventionally defined, captures is that between polar and nonpolar states. Further, this measure draws a stark dichotomy between these groups of states. This leads scholars who utilize polarity to discount heavily the importance of nonpolar major powers. But, despite the insistence on the part of many scholars that the number of poles alone defines the structure of the system, a wide variety of leading theories of international relations emphasize the number of major—as well as polar—powers and the inequality of power among them. As a result, analyses of these theories that center solely on polarity (or

[25]Indeed, even the highest observed levels of concentration may be nonhegemonic, since there need not be a particularly strong relationship between these features of the distribution of power.

[26]See Richardson (1976) and Gochman and Ray (1979) for studies that examine concentration in subsystemic analyses of the international political economy.

concentration[27]) may underestimate the importance of the distribution of power in shaping patterns of global outcomes.

This tendency is likely to be particularly pronounced in studies of balancing behavior, the onset of war, and the international political economy. Previous studies have produced substantial evidence that balancing in multipolar systems may be influenced by both the number of major powers and the relative inequality among them. Further, the extent to which poles in bipolar systems will rely exclusively on internal means to balance one another may depend upon the relative inequality between these actors and the relative size of nonpolar major powers.

In addition, some balance-of-power theorists (and many of their critics) suggest that both the number of poles and the level of concentration are likely to influence the outbreak of war. They often argue that wars occur in response to the disproportionate growth of one state. This implies that the level of inequality *among the poles* may be an important determinant of war. Focusing on the number of poles provides no insight into the dynamic that these theorists emphasize. Systems of this sort are multipolar both prior to, and during, the emergence of a potential hegemon. Thus, we would expect different types of multipolar systems to be related to the onset of war in very different ways. Relying solely on the number of preponderant states in the system to measure the distribution of power is likely to mask these important variations.

Finally, structural analyses of the international political economy would also benefit from a greater reliance on concentration. For example, the issue of whether market power is related to outcomes in the global trading system cannot be addressed adequately by focusing exclusively on hegemony. Nonhegemonic distributions of power may vary considerably in the aggregate market power that constituent states possess and thus may be related to trade in considerably different ways. Further, because the theory of collective action forms the bedrock of many variants of hegemonic stability theory, it is important to consider both group size and relative inequality in studies of this sort. But hegemony describes only the most extreme inequality of power and fails to address the issue of group size. Small-group theorists fall into the opposite trap: they examine only group size, and virtually ignore the impact of relative inequality on outcomes in the international political economy. Concentration, unlike hegemony or group size, captures both the number of major powers and the relative inequality of power among them.

Analyses of the distribution of power have led to significant advances in the field of international relations. However, these studies have also been criticized for failing to adequately explain patterns of global outcomes. The argument advanced in this paper implies that, in many cases, these failures can be traced to the persistent tendency for scholars to rely only on polarity to measure the distribution

[27]Like polarity, indices of concentration are not without limitations. For example, scholars who have utilized this measure of the distribution of power generally focus on the concentration of *capabilities* in the international system. Disagreements persist over: (1) the merits of using capabilities to measure power; and (2) the particular capabilities that should be analyzed in this regard. Many analysts argue that capabilities are inadequate measures of power (March, 1966; Dahl, 1976; Baldwin, 1979, 1980; Keohane, 1984, 1986; Frey, 1986). Indeed, this problem besets most neorealist analyses, not only those that focus on concentration. Many neorealists acknowledge that their efforts to define and measure power have fallen short (*e. g.*, Waltz, 1986:333). However, because no feasible alternatives exist for measuring potential power in international relations, resource-based indices continue to be widely used by both neorealists and their critics.

Further, there is often some disagreement concerning the nations among which concentration is to be measured. Scholars generally measure the concentration of capabilities among the major powers in the international system. How, then, should a major power be defined? There is, in fact, considerable convergence in the definition and coding that is used to identify a major power (Small and Singer, 1982; Levy, 1983; Thompson, 1983, 1988; Modelski and Thompson, 1988). But the differences that do exist may help to explain some of the empirical variations in the findings of studies of the relationships between concentration and war and concentration and trade.

of power. Despite protestations to the contrary, the aspects of the system's structure that are measured by concentration—but not by the number of poles—are emphasized in many realist and neorealist theories of international relations. This may help to explain why empirical studies that focus solely on the effects of polarity often conclude that the usefulness of these theories is quite limited. In order to more fully assess the explanatory power of many theories of international relations that emphasize the influence of the distribution of power, additional empirical research is needed concerning the effects of both polarity and concentration.

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