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Kantian Liberalism, Regime Type, and Military Resource Allocation: Do Democracies Spend Less?

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In this paper, we evaluate the liberal claim that democratic states devote fewer resources to their militaries. Low military spending is thought to avert conflict spirals and release more resources to fund domestic programs. While prominent in many liberal international relations theories, most notably in Immanuel Kant's, this proposition has received little empirical scrutiny. Using several indicators of military resource allocation and data on a wide range of states since 1816, we find empirical support for the liberal argument, although regime type is not necessarily the strongest influence on military resource allocation.

Liberal paths to peace have recently received a great deal of attention in international relations. Much of this recent research has been associated with the philosophy of Immanuel Kant (1724–1804). Kant's political thought has come to provide a coherent theoretical foundation for liberalism in international relations. Conjectures on the democratic peace, the effects of international organizations, trade, and globalization are frequently traced back to ideas put forth by Kant. The works of Bruce Russett and John Oneal (2001; Oneal and Russett, 1997, 1999; Russett, 1998) stand as examples of how an initial reliance on Kantian conjectures has led to refined hypotheses and significant findings supporting liberal expectations. Russett and Oneal (2001:271) construct a "Kantian triangle of peace" consisting of three elements: "republican constitutions, 'cosmopolitan-law' embodied in free trade and economic interdependence, and international law and organizations." While re-

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publican government, trade, and international law are integral parts of liberalism, Kant's vision of a liberal peace can hardly be reduced to these three elements. In spite of this recent deluge of research on the Kantian peace, many aspects central to Kant's liberalism have received surprisingly little attention.

One such omission is Kant's claim that liberal states will allocate fewer resources to their militaries than will authoritarian states. The lack of research on this question is somewhat surprising given the emphasis Kant and other liberals place on anti-militarism. In several lucid lapses that are rare in his political philosophy, Kant (1784, 1786, 1795) consistently highlights the advantages of small militaries. In his Third Preliminary Article in "Perpetual Peace," Kant (1795:94) advises that "Standing armies (*miles perpetuus*) will gradually be abolished." This abolition of large militaries will occur gradually and will be part of the expansion of a liberal, republican-centered international society.

Reduced military spending, according to Kant, will promote both peace and prosperity. First, by spending less on their militaries, republican states will advance peace by avoiding conflict spirals. Second, Kant argues that leaders can better safeguard political rights and provide more resources for education and other social goods by devoting less to military spending. For Kant and subsequent liberals, these considerations will lead democratic states to devote less to their militaries than authoritarian states. Just as Woodrow Wilson envisioned a world where self-determined states and a strong League of Nations would enable states to reduce military spending "to the lowest point consistent with domestic safety" (the fourth of his Fourteen Points), Kant predicted that a federation of republican states would diminish the need for large militaries. Liberals have long claimed that as democratic states proliferate, the share of resources allocated to the military would decline.

This study evaluates the liberal argument about democracy and military resource allocation. We begin by highlighting Kant's claims about democratic governance and reduced military allocation. These claims are central to a broader and long-enduring liberal argument about international peace and prosperity. Liberals claim that states can avoid conflict spirals and provide more resources for domestic needs by spending less on their militaries. Because democracies are guided by the needs of their citizens rather than the interests of a small elite that might benefit from war, these twin concerns should lead to less military spending by liberal, democratic states. If the liberals are indeed correct, democracies should allocate fewer resources to their militaries than do autocracies, once one controls for the effects of other influences, particularly wars and threats of war. We present empirical tests of the liberal argument using several indicators to measure shares of national resources allocated to the military. We find that, although other considerations may outweigh the effects of regime type, liberal states tend to devote proportionally less to their militaries than do autocratic states.

Democracy and Military Spending in Liberal Thought

Liberal international relations theorists expect democratic states to spend less on their militaries for two primary reasons. First, high levels of military spending intensify the security dilemma and may spiral to war. Second, high levels of militarization will jeopardize the "good life" in the domestic realm. At the same time, liberals also recognize how certain groups in society may benefit from preparations for war, and how these groups may control decisions about military resource allocation in autocratic states. As a result, liberal states, with broad majorities holding power, are expected to spend far less on their militaries than authoritarian states. Since these liberal claims about military resource allocation are central to international relations theory from Kant to Bueno de Mesquita, they demand some elaboration.

In "Conjectures on the Beginning of Human History," Kant (1786:231–232) considers the "ever-increasing *preparation* for war in the future" to be among the

"greatest evils which oppress civilized nations. . ." Kant (1795:94–95) later elaborates two reasons for this in the Third Preliminary Article of "Perpetual Peace."

> Standing Armies *(miles perpetuus)* will gradually be abolished. For they [states with large armies] constantly threaten other states with war by the very fact that they are always prepared for it. They spur on the states to outdo one another in arming unlimited numbers of soldiers, and since the resultant costs eventually make peace more oppressive than war, the armies are themselves the cause of wars of aggression, which set out to end burdensome military expenditure. Furthermore, the hiring of men to kill or to be killed seems to mean using them as mere machines and instruments in the hands of someone else (the state), which cannot easily be reconciled with the rights of man. . .

Kant concludes this Article by claiming that any rapid growth in capabilities by one state "would be seen by other states as a military threat; it might compel them to mount preventative attacks."

This line of reasoning has a long lineage in liberal thought. Well before Jervis (1976:67) showed how arms increases "cannot only create conflicts and tensions [between states] but also provide the dynamics triggering war," Noyes (1912:255) pointed out how "the constant accumulation of such weapons of offense leads to a restless suspicion of other nations which are pursuing the same policy." Bertrand Russell (1917:59) also cautioned that "When the means of offense exist, even though their original purpose may have been defensive, the temptation to use them is likely . . . the very measures which promoted security within the borders of the State promote insecurity elsewhere." Because of the dangers posed by heightened suspicion, leaders of liberal states would be wise to avoid the possibility of spirals by spending less on their militaries.

Liberal concerns with arms spirals, however, may be eclipsed by worries that high peacetime military expenditures adversely affect the domestic realm. As Michael Doyle (1997:208) notes, liberalism emerged largely as a theory of domestic politics concentrating on "individual rights, private property, and representative government." Kant's second critique focuses on the harmful effects of militarization in the domestic arena. In the passage most frequently cited by democratic peace theorists, Kant (1795:100) illustrates how the high costs of war preparation and prosecution would lead liberal states away from such endeavors:

> If, as is inevitably the case under this constitution, the consent of the citizens is required to decide whether or not war is to be declared, it is very natural that they will have great hesitation in embarking on so dangerous an enterprise. For this would mean calling down on themselves all the miseries of war, such as doing the fighting themselves, supplying the costs of war from their own resources . . . and, as the crowning evil, having to take upon themselves the burden of debt. . .

The "crowning evil" of war resides in the debt incurred by mobilizing resources for destructive pursuits. All resources devoted to the military will likely come at the cost of valued social goods like education. In an earlier essay, "Idea for a Universal History," Kant (1784a:51) makes the guns-vs.-butter argument more forcefully. As a result of high military spending, Kant argues that "the world's present rulers have no money to spare for public educational institutions or indeed for anything which concerns the world's best interests (for everything has already been calculated out in advance for the next war)." To safeguard resources for social programs like education, liberal regimes would consistently seek to limit military spending in periods of peace.

Liberals also claim that high levels of military spending may threaten civil liberties and political freedoms in the domestic realm. Kant (1786:232) notes how military preparedness can draw "all the resources of the state, and all the fruits of its culture which might be used to enhance that culture even further are devoted to

this purpose. Freedom suffers greatly in numerous ways. . .'' Others have since echoed Kant's concerns. Hedley Bull (1961:3) points to how high rates of military expenditure might ''instill military values over values of democracy, freedom and free thinking.'' High military expenditures may also increase the number of military advisors, military analysts, and professional soldiers taking part in the decision-making process. This increased level of militarization may, as Wallensteen, Galtung, and Portales (1985:12) note, enhance the ''preference for violent courses of action at the expense of non-violent ways of influence.'' Liberals see the likelihood of using military force to be positively related to the size and preparedness of the military. To help safeguard civil liberties at home and discourage the wanton use of force abroad, liberals expect the majority of citizens in democratic states to oppose high levels of peacetime military spending in most cases.

Kant is by no means original in his claim that republican or democratic regimes will devote less to their militaries. Before ''Perpetual Peace,'' the claim that democracies would spend less on the military was popularly circulated in pamphlets written by Thomas Paine. According to Paine, monarchs—or any government with limited suffrage—could wage a war for private benefits while spreading the costs of that war to all the members of society. Paine (1787:10) argues that wars waged by authoritarian regimes benefit a small circle through ''jobs and contracts, and the groaning multitude bore the burden.'' According to Paine (1791:99), ''[t]axes were not raised to carry on wars, but that wars were raised to carry on taxes.'' Paine's logic is clear. So long as the decision to wage war rested with the few who would most likely benefit from it and the costs were paid by the multitude, wars would be waged frequently. If monarchs could no longer use military spending to dole out private goods in terms of contracts to their cronies, the war–tax–war cycle could be broken. For Paine, democratic rule would quickly put an end to the private goods produced by large military outlays and war.

Contemporary theoretical accounts of the democratic peace have advanced claims that parallel those of Paine and Kant. Bueno de Mesquita, Morrow, Siverson, and Smith (1999) and Bueno de Mesquita, Smith, Siverson, and Morrow (2003) present a formal model to support several claims about the conflict behavior of democratic regimes. Their result hinges on the size of the group whose support is required to maintain the state leader in power. In states where this ''winning coalition'' is large, leaders' political fortunes depend primarily on delivering successful public policy outcomes—public goods—because they cannot afford to provide private goods to all those whose support is needed. Conversely, these states are unattractive as targets of aggression, because they will devote more resources to winning a war once it has begun. They are also more careful in selecting targets of their own because their wars must generate public goods. The implications of this line of argument for militarization complement earlier liberal theories. State leaders with large winning coalitions should devote a smaller share of national income to military uses in peacetime because the private goods produced by military spending are less useful to these state leaders. These leaders benefit only from the public-good portion of the military budget.

Research on the economics of military spending reaches the same conclusion about the democratic preference for a small military budget. Reviewing this literature, Sandler and Hartley (1995:57) note that models in which a bureaucratic decision maker sets the level of spending usually imply larger budgets than those in which the median voter's preferences determine policy choice. In these models, bureaucrats seek to maximize the difference between spending and cost, leaving them with a surplus they can use as they see fit (Gonzales and Mehay, 1990). If defense is underprovided, like most public goods, such a deviation from public preferences may have some desirable consequences. Indeed, some have even argued that bureaucratic or interest group domination of the decision-making process may facilitate the development of an adequate defense in a democracy

(Lee, 1990, Jones, 1992). In any event, this line of argument suggests that, other things being equal, democratic policy making implies lower military spending.

Liberal states are thought to spend less on their militaries for domestic political reasons, to avoid conflict spirals, and because they view the nature of the international system as less threatening. Yet there has been very little systematic research on this question so central to liberal theory. One possible explanation for this dearth of research is that liberals and realists alike frequently and without hesitation assert that democratic states typically devote less resources to their militaries. Some realists claim that democracies are especially prone to neglect military preparedness, perilously so. Kennan (1951, in Reiterand Stam, 2002:118), for instance, alludes to the dangerous and unwarranted military complaisance of democratic powers. Similarly, Morgenthau (1948:60) argued that American unwillingness to build up its military before World War II "invited neglect and attack from its enemies." While liberals and realists disagree normatively on what democratic states should spend on their militaries and why, they often agree empirically that democratic states spend less than authoritarian states. This agreement only highlights the importance of more systematic tests of the liberal claim. To these tests we now turn.

Measuring Resource Allocation for Military Purposes

While the argument that liberal states will resist the burdens imposed by military allocation is reasonably clear, the best way to measure military burden is not. Determining the level of resources allocated for military purposes is difficult because of the scarcity of reliable data. Efforts to overcome this shortage of data have sometimes sparked controversy in previous research on related issues (e.g., McCubbins, 1983; Wayman, Singer, and Goertz, 1983; Diehl, 1985; Goertz and Diehl, 1986.) Lacking a single best indicator of military burden, we will use three indicators suggested in previous research, checking for the effects of their shortcomings in our analysis.

Military Spending as a Percentage of Gross Domestic Product

Because the share of the economy dedicated to military use captures these burdens most broadly, it is probably the best general measure of military resource allocation, as well as the most widely used (e.g., Goldsmith, 2003). Unfortunately, data on gross domestic product (GDP) are widely available only for the Cold-War era. This period was unusual in some respects. The fact that most democracies were part of an alliance system dominated by the United States could arguably influence the proportion of national income they devoted to military purposes, limiting the applicability of our findings.

We will address this concern in two ways. First, we will estimate the model separately on major powers, for which GDP data are available over a much longer period.[1] Second, we will augment the available GDP data with estimated values for the 1816–1949 period, for which military spending data are also available. We obtained these estimates by regressing observed values of GDP in the 1950–1997 period onto energy consumption, iron and steel production, total population, and urban population. Obviously, estimates obtained from this model embody the assumption that the independent variables had the same relationship with GDP before 1950 that they have had since then. Although this assumption is undoubtedly false in many cases, and our analysis offers only a rough test of the hypothesis that

[1] The major powers identified in the Correlates of War Project, which are accepted in most research that uses the concept, are Austria–Hungary (1816–1918), China (1950–1997), France (1816–1940 and 1945–1997), Italy (1860–1943), Japan (1895–1945), Prussia/Germany (1816–1918 and 1922–1945), Russia/USSR (1816–1917 and 1922–1997), the United Kingdom (1816–1997), and the United States (1899–1997).

democracies spend less during the pre-1950 period, we have no reason to believe that the estimated GDP values are biased either for or against this hypothesis.[2]

Military Personnel as a Percentage of the Population

Because data on population and military personnel are much more widely available than data on overall economic activity, the percentage of the population under arms is a useful alternative to the military share of GDP (Reiter and Stam, 2002:138–40). Between 1950 and 1997, this indicator was correlated with military spending as a percentage of GDP, although not perfectly ($\rho = 0.50$).

The proportion of the population under arms does not necessarily reflect the full burden of preparations for war because some states may substitute military equipment and technology for personnel, producing a smaller but possibly more expensive military. This substitution of capital for labor is especially likely later in our sample, as military technology and capital equipment have become increasingly important relative to the sheer number of military personnel (Diehl and Goertz, 1986:561–2). In order to check for the effects of this problem with the personnel-based index of military resource allocation, we will estimate the model separately on the 1816–1860 and 1946–1997 periods. Following Diehl (1985), we selected the earlier period because military personnel should be more important before most states in the system were industrialized. If the substitution of capital for labor became more prevalent after industrialization, parameter values for these two periods will differ, and examining them separately will produce better estimates of the underlying relationship between democracy and military personnel.

A Regression-Based Index of Military Resource Allocation

Diehl (1985) developed a regression-based index of military resource allocation using the Correlates of War Project's National Military Capabilities Dataset.[3] He divided the available data into four periods corresponding to different patterns of military spending: 1816–1860, 1861–1913, 1919–1938, and 1946–1980. In the first period, Diehl regressed total population on military personnel and used the predicted values from this model to indicate the expected annual level of military personnel for each state. For the remaining three periods, he regressed energy consumption and iron and steel production separately onto military expenditure. He used the mean of the annual values predicted by these two regressions to indicate the expected level of military spending. Dividing observed military personnel or expenditure by their expected values yielded an index of over- or under allocation for military purposes that considers the size of the state's population and

[2] Data on energy consumption, iron and steel production, urban population, and total population are from the National Military Capabilities Dataset, version 3.0, produced by the Correlates of War 2 Project (http://cow2.la.psu.edu/; see also Singer, 1987). Data on GDP were assembled by Kristian Gleditsch (2002; http://weber.ucsd.edu/ ~ kgledits/exptradegdp.html). A GLS time-series cross-sectional model with a first-order autoregressive error process, recommended by Baltagi and Wu (1999), was used for estimation. In order to control for the effects of postwar inflation, GDP data were deflated to 1929–1939 values using the U.S. GDP deflator before the model was estimated.

[3] Diehl's index was a refinement of that used by Wayman et al. (1983). They used the ratio of a state's share of total military expenditure to its share of total energy consumption and iron and steel production as an index of military resource allocation for major powers. Unfortunately, this index is quite problematic when applied to a sample that includes small, agricultural, and less developed states. 10.8% of the observations for which COW capability data are available generate missing values on this index because their average share of system energy consumption and iron and steel production, which provides the denominator in the index, is zero. Those with very small but non-zero shares on the economic variables often generate extremely high values on the index. Of the 10.2 percent of observations on this index greater than 20, the *maximum* share of the economic variables was only 0.009, roughly one standard deviation less than the *mean* value for the sample as a whole (0.014).

level of industrial development. We will replicate Diehl's index for the analysis that follows.[4]

Diehl and Goertz (1986:564) indicate a possible weakness of this index. They point out that the fit of the models for the 1919–1938 period was substantially weaker than for the earlier and later periods. Our replication of Diehl's procedure on the updated COW capabilities data confirmed this. We found that the fit for the 1861–1913 period was also relatively poor.[5] These poor-fitting models may not generate very good estimates of "normal" military spending. This problem is exacerbated here by the huge values many states recorded during World War I, a period for which data were missing in the dataset Diehl originally used, and one not included in the regressions used here. We will estimate the model separately on the 1816–1860 and 1946–1997 periods, when the fit of the models was relatively good, in order to evaluate the impact of these problems on the index. Given the variation in the quality of model fit over time, these regressions may produce more reliable estimates of the relationship between regime type and military resource allocation.

None of these three indices perfectly captures the share of national resources allocated to the military. In principle, military spending as a percentage of GDP is best, but it suffers from serious problems of data availability. By using multiple indicators of the military allocation and checking for the potential weaknesses of each, we hope to provide the best possible test of the liberal argument that democratic states will resist the burdens of high military expenditures using the widest available data. Table 1 presents descriptive statistics and sources on the indicators of military allocation used here.

Influences on Resource Allocation for Military Purposes

Most empirical studies of the democratic peace, including the work of Russett and Oneal, have operationalized democracy using data gathered by the Polity project, most recently updated in Marshall and Jaggers (2000). The Polity project assigns annual scores to each state reflecting its democratic and autocratic characteristics in executive recruitment, participation, and other features of aspects of the political system. The most commonly used composite measure of democracy, the "polity score," is computed by subtracting the autocracy score from the democracy score, yielding an index ranging from -10 (most autocratic) to 10 (most democratic). We will use this score to indicate the level of democracy. Other indices are available, but

[4] Our replication of his index differs from Diehl's original version in three relatively minor ways. First, because the Correlates of War Project has updated the National Military Capabilities Dataset, we have an additional 21 years of data not available when Diehl wrote his article. Second, as Diehl and Goertz (1986:564) suggest, we converted military spending data from the 1946–2001 period, when inflation was a serious problem, into constant 2000 dollars using the United States GDP deflator before estimating the model. Third, we used a GLS time-series cross-sectional regression model with fixed effects for each state. Because of the vast differences between the growing number of states in the sample during the 1946–2001 period, regression models without fixed effects produced predicted values less than zero.

[5] R^2 statistics for the regressions used to produce the index were as follows.

	Independent Variable		
Period:	*Population*	*Iron and Steel Production*	*Energy Consumption*
1816–1860	0.64		
1861–1913		0.34	0.34
1919–1939		0.15	0.21
1946–1997		0.82	0.65

TABLE 1. Descriptive Statistics and Sources on Indicators of Military Allocation

	Mean	*SD*	*Min*	*Max*	*States*	*Mean Time Periods*	*Total n*
Military spending as a percentage of GDP							
All states, 1950–1997*	2.61	4.78	0	136.87	191	32.26	6161
Major powers, 1816–1997†	6.12	8.39	0.34	80.60	8	98.63	789
Estimated values for all states, 1816–1997‡	2.08	4.76	0	136.87	202	50.35	10171
Military personnel as a percentage of population§	0.76	1.06	0	21.13	213	56.18	11967
Regression-based index of military allocation¶	0.59	2.21	0	117.75	212	51.38	10892

Note: Four states with extraordinarily long periods of foreign rule—Latvia, Lithuania, Estonia, and Morocco—were treated as different states before and after these interruptions. Germany was treated as a continuation of West Germany (COW state code 260) after 1990.

Source notes:

*Military spending was taken from the COW National Military Capabilities Dataset, version 3.0 (http://cow2.la.psu.edu/). Gross domestic product data compiled by Gleditsch (2002).

†Military spending data are from the COW National Military Capabilities Dataset (http://cow2.la.psu.edu/), transformed to current year original currencies using the COW conversion rates in the Polity II dataset (Gurr, 1990) through 1985, and the Penn World Tables (Heston and Summers, 2000) through 1997. Gross domestic product data are from Mitchell (1998a, b) for all states expect the United States. United States data are from the Department of Commerce (1975) through 1939, and the National Income and Product Accounts, as presented by the Office of Management and Budget (2002) from 1940–1992. Comparable data were not available on China (1950–1992) or Austria-Hungary (1816–1918).

‡Estimated values were produced by regressing observed GDP data for the 1950–1998 period from Gleditsch (2002) on total population, urban population, iron and steel production, and energy consumption, all from the COW National Military Capabilities Dataset, version 3.0 (http://cow2.la.psu.edu/). Estimates from this model were used along with COW data on military expenditures to produce estimates of the defense burden for the 1816–1949 period. Observed values were used for major powers and for all states after 1949.

§COW National Military Capabilities Dataset, version 3.0 (http://cow2.la.psu.edu/).

¶Military spending and personnel data, iron and steel production, and energy consumption data are from the Correlates of War National Military Capabilities Dataset, version 3.0 (http://cow2.la.psu.edu/). Spending data on the 1946–2001 period were transformed into 1929–1939 dollars before the index was computed using the United States gross domestic product deflator from the National Income and Product Accounts produced by the U.S. Department of Commerce, Bureau of Economic Analysis (http://www.bea.gov).

considerations of space, and the fact that they are highly correlated with the polity score, preclude examining them here.[6]

A simple examination of the bivariate relationship between democracy and militarization would not be very convincing. Liberal theorists do not argue that democracies will resist military spending under all circumstances: only when it is used to provide private goods, such as profits for military contractors, rather than the public good of defending the society against foreign threats. Also, a bivariate comparison would not provide any basis for comparing the substantive effect of regime type with that of other variables commonly thought to influence military allocation. A multivariate model allows us to put the effect of regime type on the defense burden into perspective.

In their comprehensive review of the economic literature on the demand for military spending, Sandler and Hartley (1995:60) suggest three considerations that are also relevant to a study of the military burden: the state's income, the threats it faces, and the military power of its allies.[7] Although the implications of these con-

[6] Examples of other democracy scores include the indices of the size of the selectorate and winning coalition suggested by Bueno de Mesquita et al. (2003) and the index of democracy presented by Vanhanen (2000). The size of the winning coalition, which is constructed using indicators drawn from the Polity data, is correlated with the polity score at $\rho = 0.80$. The Vanhanen index of democracy is correlated with the polity score at $\rho = 0.77$.

[7] Sandler and Hartley also offer a fourth consideration—the relative price of military as opposed to civilian goods. If military prices rise more rapidly than prices in the civilian sector, the real amount of military goods and services demanded should decline. Military prices indeed appear to have risen more rapidly than civilian prices in both the U.S. and British cases (Smith, 1980; Fordham, 2003). Unfortunately, as Sandler and Hartley (1995:61)

siderations are somewhat different when modeling defense burden rather than the level of military expenditure, they provide a useful starting point when considering other influences on military spending.

Sandler and Hartley argue that military spending should rise with national income as the state has both more to protect and more resources with which to protect it. This is certainly true of the absolute level of military expenditure, but the public-good character of military spending makes a negative relationship between income and the share of resources allocated for military use likely. The fact that the benefits of national defense are non-rivalrous implies that economic growth or increases in population do not necessarily require additional expenditures to provide the same level of this good to the population. Moreover, relatively large states do not need as large a share of their national resources in order to compete militarily with smaller states. In order to capture this effect, we will include indicators of state size related to the resource pool used in the dependent variable. We will use GDP in models of military spending as a percentage of GDP. We will use total population in models of the percentage of the population under arms. We will treat Diehl's regression-based index of military allocation as a function of the share of total population through 1860, and its mean share of energy consumption and iron and steel production after that date.

Threats to the state can increase both the level of military spending and the defense burden. In order to represent the threat posed by other states, we will consider the military power of the "strategic rivals" that William Thompson (2001) has identified for each state. Thompson's conception of rivalry is useful in this context because it focuses on states that are perceived to pose an ongoing military threat, and thus are likely to influence decisions about military spending.[8] In the analysis that follows we will use the total value of the COW Project's widely used composite index of national capabilities (CINC) for these rivals to indicate the level of threat faced by a given state.[9]

Ongoing wars make even more acute demands on national resources than do threats posed by rival states. Even a cursory examination of any military spending or defense burden series reveals large spikes in times of war. To capture the intensity of involvement in military conflict, we will use the annual number of battle deaths incurred in interstate or extrastate wars as a percentage of the state's population.[10] In order to capture the militarizing effect of internal wars, we will include the percentage of the state's population killed in intrastate wars within the country each year.[11] We chose to treat internal and external wars separately because their effects may differ. Internal wars that split a state's military, or prevent it from

point out, data on the relative prices are not readily available for very many states. Moreover, the implications of rising military prices for the share of national resources allocated to military uses are uncertain. While demand for military goods and services may fall, the share of national resources required to obtain this diminished amount may remain unchanged, or even rise as the relative price of military goods and services increases.

[8] The rivalries Diehl and Goertz (2000) identify include many relationships that, while conflictual, are not as likely to influence decisions about military spending. For example, U.S. rivals in the postwar era have included Canada, Ecuador, and Peru.

[9] The CINC score is derived from the state's share of the indicators of national capabilities gathered by the COW Project: military spending, military personnel, iron and steel production, energy consumption, urban population, and total population. It is generally computed by summing all observations on each of the six capability components for a given year, converting each state's absolute component to a share of the international system, and then averaging across the six components (Singer, Bremer, and Stuckey, 1972; Singer, 1987; http://cow2.la.psu.edu/).

[10] Data are from the Correlates of War Project's war data, version 3.0 (Sarkees, 2000). Because the COW data do not record annual battle death totals, but only the total number of casualties incurred in the war, we divided the state's total battle deaths by the maximum duration of the war in days, and then aggregated the daily average for each year of the war. Although the assumption that battle deaths were evenly distributed over time is certainly not true, we have no reason to believe that it will bias our results.

[11] Battle deaths incurred while intervening in other states' civil wars were treated as deaths in external wars. In the Correlates of War Project's intrastate war data, this means that only data on the initiating state were used for our internal war death variable.

extracting resources from society for military use might be associated with a lower (apparent) level of military resource allocation. Furthermore, many internal wars are conducted in part by paramilitary forces that do not draw exclusively on the state military resources measured in our data. Internal wars are likely to influence military resource allocation in the broadest sense, but may not have the same effects in the data we use.

The military power of allies may also influence decisions about military resource allocation. Olson and Zeckhauser (1966) suggested that states with powerful allies might enjoy the benefits of collective defense while devoting a relatively small share of national resources to the military. Empirical tests of whether states actually engage in this form of free-riding have produced mixed results, in part because defense among alliance members is not a pure public good.[12] Nevertheless, the possibility that the military power of its allies could affect a state's defense burden remains theoretically relevant. We will test for this effect by including in the model the total CINC scores of a state's allies. We define allies as those states with which a given state has a Type I alliance (defense pact) in the COW alliance dataset (Gibler and Sarkees, forthcoming; http://cow2.la.psu.edu/).

Because states do not use their militaries exclusively for national defense, we will include a variable indicating one of the other purposes for which it has been used: the size of empire. The effect of imperialism on military resource allocation provides another useful baseline for assessing the substantive impact of democracy because it reflects a policy choice rather than an externally imposed condition. In some cases, involvement in war and international rivalry may stem from the choice of an aggressive foreign policy, but these conditions could just as easily result from the aggressive behavior of other states. By contrast, liberal theory generally treats imperialism as a policy states adopt largely of their own volition, and contrary to liberal advice. Liberals, like Hobson (1902:138) warned that imperialism "makes for war and militarism, and has brought a great and limitless increase of expenditure of national resources upon armaments." Recent research on the behavior of democracies underscores what is obvious to anyone familiar with the history of 19th century imperialism: having a democratic regime does not rule out such aggressive policy choices (Bueno de Mesquita et al., 1999:801; Reiter and Stam, 2002:144–163; Bueno de Mesquita et al., 2003). In assessing the substantive importance of regime type for military resource allocation, it is useful to know if the militarizing effects of imperialism exceed the demilitarizing effects of democracy, as Hobson and other liberal critics of imperialism feared they would. Our model will include the population of the state's empire reported by Banks (2002) to indicate the scope of the state's imperial commitment.

Empirical Results

Table 2 presents the results of three time-series cross-sectional regressions using the three indicators of military allocation discussed in the last section. The models were estimated using Prais–Winsten regression with panel-corrected standard errors, and assume a first-order autoregressive error process. We selected this approach because it avoids some potential pitfalls associated with other time-series cross-sectional methods with data like ours. In recommending panel-corrected standard errors, Beck and Katz (1995) argue that some GLS models may greatly underestimate the standard errors in datasets with relatively long time series. Although we got very similar results using the GLS approach suggested by Baltagi and Wu (1999), we decided to present the model with panel-corrected standard errors in view of these concerns. Another alternative is to employ a population-averaged generalized estimating equations (GEE) model. Unfortunately, Zorn (2001:477)

[12]For a review of this large body of research, see Sandler and Hartley (1995:19–51).

TABLE 2. Regime Type and Other Determinants of Military Allocation

	Military Spending as a Percentage of GDP (1950–1997)	*Military Personnel as a Percentage of State Population (1816–1997)*	*Regression-Based Index of Military Allocation (1816–1997)*
Polity score	− 0.04*	− 0.001	− 0.009
	(0.01)	(0.004)	(0.006)
External war battle deaths	12.10*	1.06*	7.10*
(percentage of population)	(3.83)	(0.08)	(0.70)
Internal war battle deaths	0.07	0.002	0.05*
(percentage of population)	(0.05)	(0.016)	(0.01)
Total CINC score of rivals	6.89*	2.00*	4.16
	(2.49)	(0.55)	(2.17)
Total CINC score of allies	− 0.37	0.63*	2.07*
	(1.07)	(0.21)	(0.48)
Size	− 0.35	− 0.001*	− 0.52
	(0.26)	(0.0003)	(2.78)
Population of empire (thousands)	0.004	0.002	0.007
	(0.005)	(0.001)	(0.006)
Constant	2.58*	0.71*	0.11
	(0.31)	(0.06)	(0.06)
Rho	0.91	0.89	0.86
Total *n*	5622	10745	9886
States	165	177	176
Mean years/state	34.07	60.71	56.17

Note: Asterisks indicate statistical significance at the $p < .05$ level. Coefficients were estimated using Prais–Winsten regression with panel corrected standard errors in Stata 8.1/SE, using the xtpcse procedure, assuming an AR(1) correlation structure common to all panels (Beck and Katz, 1995). Panel-corrected standard errors are in parentheses under each coefficient. The "size" variable is based on the dependent variable. See the text for details.

warns that the GEE model may not produce consistent estimates in the presence of missing data, a serious issue in this analysis.

The first model uses military spending as a percentage of GDP to indicate military resource allocation, and is estimated using all states for which data are available since 1950. The first model in Table 2, which uses military spending as a percentage of GDP as the dependent variable, indicates that regime type had a statistically significant and substantively meaningful effect on military resource allocation. It supports the liberal hypothesis that relatively democratic states will resist devoting large shares of their national resources to the military. In the broad sample of states since 1950, a 10-point shift in the polity score—from a neutral "0" to a fully democratic "10"—was associated with a reduction of 0.42 percentage points in the share of GDP spent on the military, a change of about 16 percent in the predicted value.

Although the results concerning military spending as a percentage of GDP support the liberal hypothesis, those based on the other two indicators do not. These are also presented in Table 2. In light of the shortcomings of these indicators of defense burden discussed in the last section, these results raise two possibilities. First, the finding that democracies allocate a smaller portion of GDP to military spending could be an accident of the limited sample of states. Because many democracies could rely on the United States for their security between 1950 and 1997, this period might be unusual. Second, the failure to reject the null hypothesis with respect to the other two indicators might be a result of the shortcomings of these indicators of resource allocation discussed in the last section, rather than the absence of an underlying relationship.

Table 3 presents the results of the alternative specifications discussed in the last section intended to test the potential problems of these indicators. The results

TABLE 3. Additional Evidence on the Determinants of Military Allocation

	Military Spending as a Percentage of GDP		*Military Personnel as a Percentage of State Population*		*Regression-based index of military allocation*	
	Major Powers, 1816–1997	*All states, 1816–1997 (estimates)*	*1816–1860*	*1946–1997*	*1816–1860*	*1946–1997*
Polity score	− 0.21*	− 0.05*	− 0.02*	− 0.006*	− 0.01	0.0002
	(0.07)	(0.01)	(0.01)	(0.002)	(0.01)	(0.002)
External war battle deaths	42.05*	7.74*	0.30	0.68*	0.36	2.86*
(percentage of population)	(4.14)	(0.65)	(0.49)	(0.37)	(0.55)	(0.65)
Internal war battle deaths	61.07	0.09	0.14	− 0.008	0.16	− 0.002
(percentage of population)	(92.34)	(0.05)	(0.16)	(0.014)	(0.13)	(0.005)
Total CINC score of rivals	− 0.75	4.51*	0.33	0.60*	0.41	2.28*
	(2.40)	(1.96)	(0.28)	(0.45)	(0.41)	(0.75)
Total CINC score of allies	− 2.03	1.03	0.07	0.08	0.08	0.05
	(2.10)	(0.53)	(0.07)	(0.19)	(0.09)	(0.10)
Size	0.06	− 0.03	− 0.007*	− 0.001*	1.04	− 0.40
	(0.60)	(0.07)	(0.005)	(0.0002)	(1.84)	(1.68)
Population of empire (thousands)	0.03*	0.03*	0.002	0.0000	0.003*	0.008*
	(0.005)	(0.005)	(0.001)	(0.0006)	(0.001)	(0.001)
Constant	3.81*	1.45*	0.76*	0.73*	0.60*	0.31*
	(1.13)	(0.17)	(0.09)	(0.05)	(0.06)	(0.03)
Rho	0.83	0.89	0.86	0.93	0.88	0.91
Total *n*	766	9349	1137	6208	1137	5834
States	8	169	38	166	38	165
Mean years/state	95.75	55.32	29.92	36.31	29.92	35.36

See note for Table 2.

suggest that relatively democratic states indeed allocate less to the military than do autocracies. First, the results concerning military spending as a percentage of domestic products hold up when the sample is augmented with estimated GDP data for the 1816–1949 period. In fact, the estimated effect is nearly identical. The hypothesis is also supported when tested against data on major powers from 1816–1997. In this case, the estimated effect is somewhat larger, but major powers have a higher baseline level of military resource allocation.

Second, the other two indicators offer more support for the liberal hypothesis when the shortcomings discussed in the last section are considered. Because of the changing relationship between military personnel and defense burden before and after industrialization, and the poor fit of the models used to generate the regression-based index during the 1861–1938 periods, both models were estimated separately on the 1816–1860 and 1950–1997 periods. The polity score was related to military personnel as a percentage of the population during both of these periods. As one might expect given its stronger association with the overall defense burden during the preindustrial era, this relationship was larger during the 1816–1860 period. Although the Diehl index was not significant during the 1950–1997 period, it was nearly significant during the 1816–1860 period ($p = 0.068$). Overall, the liberal hypothesis receives strong support from the best indicator of defense burden, and limited support from other indicators. Although this evidence is not as unambiguous as support for the democratic peace proposition, democracies indeed appear to allocate fewer resources to the military than do autocracies.

How important was regime type in shaping military resource allocation compared with other considerations? In order to put the impact of regime type into perspective, Table 4 presents the changes in three other variables that would be required to produce a shift in military spending as a percentage of GDP equivalent to that associated with a 10-point decrease in the polity score. For the sake of comparison, it also presents a range of relevant familiar historical examples. The estimated effect of regime type is slightly larger over estimated GDP data for the entire 1816–1997 than over the 1950–1997 period for which more reliable data are available; thus the equivalent changes in other variables are slightly larger as well. On balance, the effects of democracy on the defense burden were substantively comparable with those of major power rivalry and imperialism, but not as great as the effect of war.

In all the models, battle deaths in external wars had large and statistically significant effects on the defense burden. (Civil war deaths had a smaller effect on military resource allocation that was not statistically significant in most of the models we estimated.) The death rate required to equal the effect of a 10-point shift in the polity score was roughly equal to that suffered by the United States in the Mexican War, or Russia in the Crimean War. Very intense wars had effects several times larger than the highest predicted effect of regime type. For example, the death rate suffered by France in World War I was associated with a 7.6 percent increase in the proportion of the economy allocated to the military in the model. (In fact, France allocated much more than this. Our estimate for 1916 is 29 percent.) Overall, of the variables considered here, war had the greatest potential effect on the defense burden.

Not surprisingly, the changes in defense burden associated with external threats were somewhat less than those associated with actual war. The models suggest that only the acquisition of a relatively powerful rival would equal the effect of a 10-point shift in the democracy score. Across the entire 1816–1997 period, only acquiring a rival as powerful as present-day China or the United States would have an effect this large. Less powerful rivals had much less impact. For example, as Table 4 indicates, a rivalry with a state as powerful as North Korea would increase a state's expected defense burden by 0.04–0.07 percentage points, a substantively meaningless amount.

TABLE 4. Estimated Effects on Military Spending as a Percentage of GDP Equivalent to a 10-Point Shift in the Polity Score

Variable	*Change*	*Historical Cases for Comparison*	
External war battle deaths (percentage of population):			
1950–1997	+ 0.04	North Korea 1951: 1.13%	United States 1847: 0.04%
		France 1916: 0.99%	Germany 1866: 0.04%
1816–1997	+ 0.07	Japan 1941: 0.11%	China 1951: 0.03%
		Russia 1854 0.06%	Egypt 1967: 0.03%
Rival state CINC score:			
1950–1997	+ 0.06	United States 1945: 0.38	China 2001: 0.13
		United Kingdom 1816: 0.34	Japan 2001: 0.05
1816–1997	+ 0.11	Germany 1939: 0.18	North Korea 2001: 0.01
		United States 2001: 0.15	
Population of Empire:			
1950–1997	—	India 1857: 241.7 million	Vietnam 1870: 10.5 million
		Nigeria 1950: 31.8 million	Philippines 1898: 9.9 million
1816–1997	+ 21 million	Iraq 2003: 24.7 million	Egypt 1870: 7.0 million

Note: Estimated effects on military spending as a percentage of gross domestic product are from the first models in Tables 2 and 3. Data on battle deaths and composite index of national capabilities for the historical cases are taken from the Correlates of War Project's War data (version 3.0), and National Military Capabilities data (version 3.0), both used to estimate the models. Data on population of actual or potential colonies are from Maddison (2003).

A state can be subject to war and international threat regardless of the decisions its leaders make. Imperialism, because it is more likely to be an unforced policy choice, offers a better baseline for comparing the relative effects of democracy and particular policy choices states make. Although the evidence is less conclusive here, it suggests that the acquisition and maintenance of empire had effects on military allocation roughly comparable with the effects of the imperial state's political institutions. The population of empire was related to the percentage of gross domestic product spent on the military only when the dataset included the pre-1950 estimates of military spending as a percentage of GDP. An increase of roughly 21 million in the population of the empire would produce a shift in the defense burden equivalent to a 10-point change in the polity score. As the comparisons in Table 4 suggest, this figure, while tiny in comparison with the largest European empires of the 19th century, is greater than the population of some relatively populous areas actually subjected to direct foreign rule. A fairly substantial imperial enterprise was necessary to match the effect of democracy on the defense burden. However, democracies that adopt this course of action may end up more militarized than autocracies that refrain from doing so. Regime type is only one of many influences on the defense burden.

Conclusion

As liberal international relations theorists have long argued, democratic states allocate a smaller share of their national resources to military uses than do autocracies, other things being equal. The demilitarizing effect of democracy is an important and often-cited feature of classical liberal theory, and it probably deserves more attention than it has received. The empirical evidence presented here strongly supports this crucial aspect of the liberal argument. Two of the three indicators we examined—including military spending as a percentage of GDP—supported the liberal hypothesis. These relationships persist even when controlling for other influences on military allocation, including war, international threats, alliances, the overall wealth of the nation, and imperialism.

Although the relationship between greater democracy and decreased militarization is important, the "other things being equal" in the opening sentence of our

conclusion must be taken seriously. Regime type is not necessarily the strongest influence on military resource allocation. Our results suggest that international pressures or choices made by democratic states on their own initiative may overwhelm the demilitarizing effect of democracy. Democracies may find themselves militarized by war and international pressure, or they may adopt aggressive or imperialistic foreign policies that produce the same result.

While regime type is only a partial explanation of military resource allocation, our evidence still suggests that democracies generally devote less to their militaries than do autocratic regimes. Some democracies still devote a great deal of resources to their militaries in absolute terms. The United States, which currently spends nearly as much on its military as does the rest of the world combined, is the clearest example of this fact. Given Kant's caution regarding progress and peace, these anomalies and deviations are not surprising. Kant (1786:232) was characteristically vague concerning the timing of the developments he discussed. He safely argued that "only when culture has reached its full development—and God only knows when that will be—will perpetual peace become possible and of benefit to us." Along with other indications of an emerging democratic peace, the evidence of decreased militarization among democratic states may be one small indication of the slow transformation of global politics that Kant began to anticipate over 200 years ago.

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