



## Wealth and Power

**P**ower lies at the heart of international politics, yet there is considerable disagreement about what power is and how to measure it. In this chapter and the next, I define power and offer rough but reliable ways to measure it. Specifically, I argue that power is based on the particular material capabilities that a state possesses. The balance of power, therefore, is a function of tangible assets—such as armored divisions and nuclear weapons—that each great power controls.

States have two kinds of power: latent power and military power. These two forms of power are closely related but not synonymous, because they are derived from different kinds of assets. Latent power refers to the socio-economic ingredients that go into building military power; it is largely based on a state's wealth and the overall size of its population. Great powers need money, technology, and personnel to build military forces and to fight wars, and a state's latent power refers to the raw potential it can draw on when competing with rival states.

In international politics, however, a state's effective power is ultimately a function of its military forces and how they compare with the military forces of rival states. The United States and the Soviet Union were the most powerful states in the world during the Cold War because their military establishments dwarfed those of other states. Japan is not a great

power today, even though it has a large and wealthy economy, because it has a small and relatively weak military, and it is heavily dependent on the United States for its security. Therefore, the balance of power is largely synonymous with the balance of military power. I define power largely in military terms because offensive realism emphasizes that force is the *ultima ratio* of international politics.<sup>1</sup>

Military power is based largely on the size and strength of a state's army and its supporting air and naval forces. Even in a nuclear world, armies are the core ingredient of military power. Independent naval forces and strategic air forces are not suited for conquering territory, nor are they much good by themselves at coercing other states into making territorial concessions. They certainly can contribute to a successful military campaign, but great-power wars are won mainly on the ground. The most powerful states, therefore, are those that possess the most formidable land forces.

This privileging of military power notwithstanding, states care greatly about latent power, because abundant wealth and a large population are prerequisites for building formidable military forces. During the Cold War, for example, American leaders worried about Soviet economic growth and were especially alarmed by Soviet scientific achievements (such as the Sputnik satellite launched in 1957), which they saw as signs that the Soviet Union's latent capabilities might one day exceed those of the United States. Today, the United States is increasingly worried about China, not because of its military, which is still relatively weak, but because China has more than 1.2 billion people and a rapidly modernizing economy. Should China become especially wealthy, it could readily become a military superpower and challenge the United States. These examples show that states pay careful attention to the balance of latent power as well as the balance of military power.

The next section discusses why it makes sense to define power in terms of material capabilities rather than outcomes, an approach favored by some scholars. I also explain why the balance of power is not an especially good predictor of military victory. The three sections that follow it focus on latent power. First, I discuss the fundamental importance of wealth for building powerful military forces, and then I describe the measures of wealth that I employ to capture latent power. Second, I use some histori-

cal cases to show that the rise and fall of great powers over the past two centuries has been due in good part to changes in the distribution of wealth among the major actors in the international system. Third, I explain why wealth and military power, although closely connected, are not synonymous, and I show that wealth cannot be used as a substitute measure for military might. Accordingly, I argue, we need separate indicators for latent power and military power.

### THE MATERIAL BASIS OF POWER

**A**t its most basic level, power can be defined in two different ways. Power, as I define it, represents nothing more than specific assets or material resources that are available to a state. Others, however, define power in terms of the outcomes of interactions between states. Power, they argue, is all about control or influence over other states; it is the ability of one state to force another to do something.<sup>2</sup> Robert Dahl, a prominent proponent of this view, maintains that “A has power over B to the extent that [A] can get B to do something that B would not otherwise do.”<sup>3</sup> According to this logic, power exists only when a state exercises control or influence, and therefore it can be measured only after the outcome is determined. Simply put, the most powerful state is the one that prevails in a dispute.

It might seem that there is no meaningful difference between these two definitions. After all, when two great powers get into a conflict, should not the side with greater material capabilities prevail? Some students of international politics seem to believe that in war the state with greater resources should win almost all of the time, and that, therefore, the balance of power should do an excellent job of forecasting victory in war. There is a large body of quantitative studies, for example, that employs different measures of power to try to account for the outcome of interstate conflicts.<sup>4</sup> This belief also underpins Geoffrey Blainey’s famous argument that war breaks out in good part because states cannot agree on the balance of power, but the subsequent fighting then establishes “an orderly ladder of power between victors and losers.”<sup>5</sup> If the rival states had recognized the true balance beforehand, he argues, there would have been no

war. Both sides would have foreseen the outcome and been motivated to negotiate a peaceful settlement based on existing power realities, rather than fight a bloody war to reach the same end.

But it is impossible to conflate these definitions of power, because the balance of power is not a highly reliable predictor of military success.<sup>6</sup> The reason is that non-material factors sometimes provide one combatant with a decisive advantage over the other. Those factors include, among others, strategy, intelligence, resolve, weather, and disease. Although material resources alone do not decide the outcome of wars, there is no question that the odds of success are substantially affected by the balance of resources, especially in protracted wars of attrition in which each side is trying to wear down the other by virtue of material superiority.<sup>7</sup> States certainly want to have more rather than less power over their rivals, because the more resources a state has at its disposal, the more likely it is to prevail in war. Of course, this is why states seek to maximize their share of world power. Nevertheless, increasing the likelihood of success does not mean that success is virtually certain. Indeed, there have been numerous wars where the victor was either less powerful or about as powerful as the loser, yet the victor prevailed because of non-material factors.

Consider strategy, which is how a state employs its forces against an opponent's forces, and which is probably the most important of the non-material factors. Clever strategies sometime allow states that are less powerful or no more powerful than their battlefield rivals to achieve victory.<sup>8</sup> The Germans, for example, employed a blitzkrieg strategy in the spring of 1940 to defeat the British and French armies, which were roughly of the same size and strength as the Wehrmacht.<sup>9</sup> The famous Schlieffen Plan, however, failed to produce a German victory against the same opponents in 1914, although a case can be made that the original version of the plan, which was more daring than the version that was finally executed, provided a blueprint for defeating France and the United Kingdom.<sup>10</sup> Strategy sometimes matters a lot.<sup>11</sup>

Russia's decisive defeat of Napoleon's army in 1812 highlights how these non-material factors can even help an outgunned defender win a war.<sup>12</sup> The French forces that spearheaded the invasion of Russia on June 23,

1812, outnumbered the Russian front-line armies by 449,000 to 211,000.<sup>13</sup> Counting reserve forces, Napoleon had a total of 674,000 troops at his disposal for the Russian campaign, while the entire Russian army numbered 409,000 regular soldiers at the start of the conflict. Moreover, the French forces were qualitatively superior to the Russian forces. Yet the Russians completely destroyed Napoleon's army during the next six months and won a decisive victory. By January 1, 1813, Napoleon had only 93,000 soldiers left to fight the Russians. A stunning 470,000 French soldiers had perished in Russia and another 100,000 were prisoners of war. The Russians, by contrast, lost a total of only 150,000 soldiers.

Weather, disease, and a smart Russian strategy defeated Napoleon. The Russians refused to engage the invasion force along their western border and instead withdrew toward Moscow, implementing a scorched-earth policy as they moved eastward.<sup>14</sup> The French army tried to catch the retreating Russian army and decisively defeat it in battle, but bad weather thwarted Napoleon's game plan. Torrential rain followed by blistering heat in the early weeks of the invasion slowed the attacking armies and allowed the Russians to escape. Disease and desertion soon became major problems for the French forces. Napoleon finally managed to engage the retreating Russian army in major battles at Smolensk (August 17) and Borodino (September 7). The French army won both battles, but they were Pyrrhic victories: French losses were high, the Russians refused to surrender, and the French army was drawn deeper into Russia. Napoleon occupied Moscow on September 14 but was forced to retreat in mid-October when the Russians still refused to quit the war. The subsequent retreat westward was a disaster for the French army, which disintegrated despite holding its own in battles with the pursuing Russian forces.<sup>15</sup> Weather again played an important role as winter set in on the retreating forces. Despite never winning a major battle in the 1812 campaign, the less powerful Russian army routed the more powerful French army.

It should be apparent that Blainey is wrong to argue that there would be no war if states could accurately measure the balance of power, because less powerful states can sometimes defeat more powerful states.<sup>16</sup> Therefore weaker states are sometimes going to initiate wars against stronger states.

The same logic also applies to states of roughly equal might. Furthermore, weaker states are sometimes going to stand up to stronger states that threaten to attack them, because there are often good reasons for defenders to think that they can fight, although outnumbered, and win.

In essence, then, it is not possible to equate the balance of tangible assets with outcomes, because non-material factors such as strategy sometimes profoundly affect outcomes. When defining power, therefore, one has to choose between material capabilities and outcomes as the basis for definition; the latter effectively incorporate the non-material as well as material ingredients of military success.

There are three reasons not to equate power with outcomes. First, when focusing on outcomes it becomes almost impossible to assess the balance of power before a conflict, since the balance can be determined only after we see which side wins. Second, this approach sometimes leads to implausible conclusions. For example, Russia might have decisively defeated Napoleon's armies in 1812, but Russia was not more powerful than France. Defining power in terms of outcomes, however, would effectively force one to argue that Russia was more powerful than France. Moreover, few would deny that the United States was a vastly more powerful state than North Vietnam, yet the weaker state was able to defeat the stronger in the Vietnam War (1965–72) because non-material factors trumped the balance of power. Third, one of the most interesting aspects of international relations is how power, which is a means, affects political outcomes, which are ends.<sup>17</sup> But there is little to say about the matter if power and outcomes are indistinguishable; there would be no difference between means and ends. We are then left with a circular argument.

#### **POPULATION AND WEALTH: THE SINEWS OF MILITARY POWER**

**L**atent power constitutes the societal resources that a state has available to build military forces.<sup>18</sup> Although there are always a variety of such resources, the size of a state's population and its wealth are the two most

important components for generating military might. Population size matters a lot, because great powers require big armies, which can be raised only in countries with large populations.<sup>19</sup> States with small populations cannot be great powers. For example, neither Israel, with its population of 7.7 million, nor Sweden, with its population of 9.1 million, can achieve great-power status in a world in which Russia, the United States, and China have populations of 142 million, 317 million, and 1.35 billion, respectively.<sup>20</sup> Population size also has important economic consequences, because only large populations can produce great wealth, the other building block of military power.<sup>21</sup>

Wealth is important because a state cannot build a powerful military if it does not have the money and technology to equip, train, and continually modernize its fighting forces.<sup>22</sup> Furthermore, the costs of waging great-power wars are enormous. For example, the total direct cost of World War I (1914–18) for all the participants was about \$200 billion.<sup>23</sup> The United States alone spent roughly \$306 billion fighting the Axis powers between 1941 and 1945—roughly three times its gross national product (GNP) in 1940.<sup>24</sup> Accordingly, the great powers in the international system are invariably among the world's wealthiest states.

Although population size and wealth are essential ingredients of military power, I use wealth alone to measure potential power. This emphasis on wealth is not because it is more important than population, but because wealth incorporates both the demographic and the economic dimensions of power. As noted, a state must have a large population to produce great wealth. Therefore, it is reasonable to assume that the states with abundant wealth will also have large populations. In short, I am not ignoring population size, just assuming that it will be captured by the indicators I use to measure wealth.

It would be easier to use population size by itself to measure latent power, because a state's population is simpler to measure than its wealth. But it is not feasible to use population size to measure latent power, because population numbers often do not reflect wealth differences among states. Both China and India, for instance, had much larger populations than either the Soviet Union or the United States during the Cold

War, but neither China nor India achieved great-power status because they were nowhere near as wealthy as the superpowers. In essence, a large population does not ensure great wealth, but great wealth does require a large population. Therefore, only wealth can be used by itself as a measure of latent power.

The concept of wealth has various meanings and can be measured in different ways. For my purposes, however, it is essential to choose an indicator of wealth that reflects a state's latent power. Specifically, it must capture a state's mobilizable wealth and its level of technological development. "Mobilizable wealth" refers to the economic resources a state has at its disposal to build military forces. It is more important than overall wealth because what matters is not simply how wealthy a state might be, but how much of that wealth is available to spend on defense. It is also important to have industries that are producing the newest and most sophisticated technologies, because they invariably get incorporated into the most advanced weaponry. The development of steel in the mid-nineteenth century and jet aircraft in the mid-twentieth century, for example, profoundly changed the arsenals of the great powers. It behooved the great powers of the day to be on the cutting edge in those industries, as well as in other industries that contributed to building formidable military forces.

GNP, which represents a state's entire output over one year, is probably the most commonly used indicator of a state's wealth. In fact, I use it to measure wealth after 1960, as discussed below. But GNP is not always a good indicator of latent power, and employing it in the wrong circumstances can give a distorted picture of the balance of latent power. The essence of the problem is that GNP is primarily a measure of a state's overall wealth, and it does not always capture important differences in the mobilizable wealth and technological sophistication of different states.

Nevertheless, GNP does a reasonably good job of measuring these two dimensions of wealth when the relevant great powers are at similar levels of economic development. For example, two highly industrialized economies—such as the United Kingdom and Germany in 1890 or Japan and the United States in 1990—are likely to have similar leading-edge industries and roughly the same ratio of overall wealth to mobilizable



wealth. The same logic applies when comparing two largely agrarian societies, such as Prussia and France in 1750.

But GNP is a poor indicator of latent power when the states being compared are at different levels of economic development. Consider what can happen when GNP is used to assess the potential power of a semi-industrialized state and a highly industrialized state. GNP, which represents the market value of all the goods and services that a state produces in a fixed period of time, is a function of both the size and the productivity of a state's labor force. The size of a state's labor force is directly related to its population size, while the productivity of its labor force is directly linked to the state's level of economic development. It is therefore possible for two states to have similar GNPs but substantially different population sizes and markedly different levels of industrialization. For example, one state might have a weak industrial base, but a relatively large population, a substantial portion of which is employed on farms, while the other state is highly industrialized, but has a considerably smaller population.<sup>25</sup>

The United Kingdom and Russia fit this profile for the hundred-year period between the fall of Napoleon in 1815 and the start of World War I in 1914. Their GNPs were similar over that period, although the United Kingdom far outdistanced Russia in terms of industrial output, as Table 3.1 makes clear. But Russia was able to hold its own in terms of GNP, because its huge peasant population grew at a robust pace over the nineteenth century.

Differences in industrial might like those between the United Kingdom and Russia, however, have important consequences for the balance of latent power. First, highly industrialized states invariably have considerably more surplus wealth to spend on defense than do semi-industrialized states, mainly because much of the physical product of the peasantry is consumed on the spot by the peasants themselves. Second, only states with the most advanced industries are capable of producing the large quantities of sophisticated weaponry that militaries need to survive in combat.<sup>26</sup>

Focusing on GNP alone, however, might lead one to think that the United Kingdom and Russia had the most powerful economies in Europe

TABLE 3.1

## Indicators of British and Russian Wealth and Population, 1830–1913

	1830	1860	1880	1900	1913
<i>GNP (billions of dollars)</i>					
<b>United Kingdom</b>	8.2	16.1	23.6	36.3	44.1
<b>Russia</b>	10.6	14.4	23.3	32.0	52.4
<i>Relative share of European wealth (percent)</i>					
<b>United Kingdom</b>	53	68	59	37	28
<b>Russia</b>	15	4	3	10	11
<i>Energy consumption (millions of metric tons of coal equivalent)</i>					
<b>United Kingdom</b>	—	73.8	125.3	171.4	195.3
<b>Russia</b>	—	1.0	5.4	30.4	54.5
<i>Iron/steel production (thousands of tons)</i>					
<b>United Kingdom</b>	690	3,880	7,870	4,979	7,787
<b>Russia</b>	190	350	450	2,201	4,925
<i>Relative share of world manufacturing output (percent)</i>					
<b>United Kingdom</b>	9.5	19.9	22.9	18.5	13.6
<b>Russia</b>	5.6	7.0	7.6	8.8	8.2
<i>Total industrial potential (United Kingdom in 1900 = 100)</i>					
<b>United Kingdom</b>	17.5	45.0	73.3	100.0	127.2
<b>Russia</b>	10.3	15.8	24.5	47.5	76.6
<i>Population (millions)</i>					
<b>United Kingdom</b>	23.8	28.8	34.6	41.2	45.6
<b>Russia</b>	57.6	76.0	100.0	135.7	175.1

SOURCES: GNP figures, which are in 1960 U.S. dollars and prices, are from Paul Bairoch, "Europe's Gross National Product: 1800–1975," *Journal of European Economic History* 5, No. 2 (Fall 1976), p. 281. Relative shares of world manufacturing output are from Paul Bairoch, "International Industrialization Levels from 1750 to 1980," *Journal of European Economic History* 11, No. 2 (Fall 1982), p. 296. Figures for total industrial potential, which assign the United Kingdom in 1900 the baseline number of 100, are from *ibid.*, p. 292. The energy consumption figures, the iron/steel production figures, and the population figures are from J. David Singer and Melvin Small, *National Material Capabilities Data, 1816–1985* (Ann Arbor, MI: Inter-University Consortium for Political and Social Research, February 1993). The figures for relative shares of European wealth are from Table 3.3.

between 1815 and 1914, and that they had the wherewithal to build formidable military forces and dominate the region's politics. As a comparison of Table 3.1 with Table 3.2 indicates, the United Kingdom and Russia led the other European great powers in terms of GNP during most of the period. In fact, this conclusion is wrong.<sup>27</sup> The United Kingdom certainly had more latent power than any other European state during the nineteenth century, especially in the middle decades of that century, which are often called the "*Pax Britannica*."<sup>28</sup> But as discussed below, the Russian economy was in an anemic state from at least the mid-nineteenth century through the 1920s. Russia had relatively little latent power during this period, which explains in good part why its military suffered crushing defeats in the Crimean War (1853–56), the Russo-Japanese War (1904–5), and World War I (1914–17).<sup>29</sup> In short, GNP fails to capture the potentially sharp difference in latent power between industrialized and semi-industrialized states.

The same problem arises when GNP is used to compare the latent power of contemporary China with Japan and the United States. Despite its rapid economic development over the past two decades, China is still a semi-industrialized state. Roughly 10 percent of its wealth remains tied up in agriculture.<sup>30</sup> Japan and the United States, on the other hand, are highly industrialized states; only 1 percent of their wealth is in agriculture. China, however, has almost five times as many people as the United States and about ten times as many people as Japan. Therefore, the balance of latent power among those three states will be biased in China's favor if GNP is the chosen measure. This problem is likely to go away with time, because China's agricultural base will continue to shrink (it accounted for 30 percent of wealth in 1980) as its economy modernizes. But for now, it must be factored into any analysis that uses GNP to measure China's latent power.

Thus, GNP is sometimes a sound measure of latent power, whereas at other times it is not. In those latter cases, one can either find an alternative indicator that does a better job of capturing latent power, or use GNP but add the appropriate qualifiers.

In measuring the balance of latent power for the long historical period from 1792 to 2000, it is impossible to find one simple but reliable indica-

TABLE 3.2

**Indicators of French and Prussian/German  
Wealth and Population, 1830–1913**

	1830	1860	1880	1900	1913
<i>GNP (billions of dollars)</i>					
<b>France</b>	8.6	13.3	17.4	23.5	27.4
<b>Germany</b>	7.2	12.8	20.0	35.8	49.8
<i>Relative share of European wealth (percent)</i>					
<b>France</b>	21	14	13	11	12
<b>Germany</b>	5	10	20	34	40
<i>Energy consumption (millions of metric tons of coal equivalent)</i>					
<b>France</b>	—	13.2	29.1	48.0	62.8
<b>Germany</b>	—	15.0	47.1	113.0	187.8
<i>Iron/steel production (thousands of tons)</i>					
<b>France</b>	270	900	1,730	1,565	4,687
<b>Germany</b>	60	400	2,470	6,461	17,600
<i>Relative share of world manufacturing output (percent)</i>					
<b>France</b>	5.2	7.9	7.8	6.8	6.1
<b>Germany</b>	3.5	4.9	8.5	13.2	14.8
<i>Total industrial potential (United Kingdom in 1900 = 100)</i>					
<b>France</b>	9.5	17.9	25.1	36.8	57.3
<b>Germany</b>	6.5	11.1	27.4	71.2	137.7
<i>Population (millions)</i>					
<b>France</b>	32.4	37.4	37.5	38.9	39.7
<b>Germany</b>	12.9	18.0	45.1	56.0	67.0

NOTE: Figures labeled "Germany" are for Prussia in 1830 and 1860, and for Germany thereafter.

SOURCES: Same as those in Table 3.1.

tor of wealth. For one thing, there is little economic data available for the years between 1792 and 1815. The main place this causes problems is in Chapter 8, when the question arises of whether Napoleonic France had more latent power than its great-power rivals, especially the United Kingdom. I attempt to deal with the problem by describing what historians say about the relative wealth of the United Kingdom and France, and also by looking at population size, the other building block of military power. This information provides a rough but probably accurate picture of the balance of latent power during the Napoleonic years.

I measure latent power between 1816 and 1960 with a straightforward composite indicator that accords equal weight to a state's iron and steel production and its energy consumption. That indicator, which effectively represents a state's industrial might, does a good job of capturing both mobilizable wealth and level of technological development for that lengthy period.<sup>31</sup> From 1960 to the present, GNP is used to measure wealth. I switched indicators in 1960 for two reasons.<sup>32</sup> First, my composite indicator is not useful after 1970, because the role of steel in the major industrial economies began to decline sharply around that time.<sup>33</sup> Thus, a different measure of potential power is needed for the years after 1970; GNP was the obvious alternative. Second, the best available GNP figures for the Soviet Union and the United States, the two great powers in the system at the time, start in 1960 and run through the end of the Cold War.<sup>34</sup> So I employ GNP for the last thirty years of the Cold War (1960–90) and the first decade of the post–Cold War era (1991–2000), taking due note of the limits of GNP as an indicator of China's latent power today.<sup>35</sup>

## THE ECONOMIC FOUNDATION OF MILITARY POWER

**A** brief look at the rise and decline of three European great powers during the last two centuries buttresses my claim that wealth underpins military power and that wealth by itself is a good indicator of latent power. The profound change that took place in the balance of power between France and Germany (Prussia before 1870) during the nineteenth century,

as well as Russia's changing position in the balance of power between 1800 and 2000, shows the crucial role of wealth in determining power.

Napoleonic France was the most powerful state in Europe between 1793 and 1815; in fact, it came close to conquering the entire continent. Prussia was probably the weakest of the great powers at that time. It was decisively defeated by Napoleon's armies in 1806 and was effectively knocked out of the European balance of power until 1813, when it took advantage of France's devastating defeat in Russia to join the balancing coalition that finally finished off Napoleon at Waterloo in June of 1815. By 1900, however, the tables had turned almost completely, and Wilhelmine Germany was emerging as Europe's next potential hegemon, while France needed alliance partners to help check its German neighbor. France and its allies subsequently went to war in 1914 and 1939 to prevent Germany from dominating Europe.

Changes in the relative wealth of France and Germany during the hundred years after Waterloo largely account for the shift in military power between them. As is clear from Table 3.2, France was considerably wealthier than Prussia from 1816 until the late 1860s, when Otto von Bismarck transformed Prussia into Germany. In fact, Germany first gained an edge over France in steel production in 1870, the year that the Franco-Prussian War broke out.<sup>36</sup> From that point until the start of World War I, the wealth gap between France and Germany steadily widened in the latter's favor. By 1913, Germany was roughly three times as wealthy as France.

This marked change in the relative wealth of France and Germany was due in part to the fact that Germany industrialized more rapidly than France in the late nineteenth and early twentieth centuries. The main cause, however, was a significant shift in the size of their respective populations, which illustrates how changes in wealth also capture changes in population. The data in Table 3.2 show that France had about a 2.5:1 advantage in population over Prussia in 1830, but that by 1913 Germany had gained roughly a 1.7:1 population advantage over France. This demographic flip-flop was the result of two factors. The French birthrate in the nineteenth century was especially low, while the German birthrate was

among the highest in Europe. Furthermore, the unified German state that Bismarck built around Prussia had a substantially larger population than Prussia itself. For example, Prussia had 19.3 million people in 1865, whereas Germany had 34.6 million people in 1870.<sup>37</sup>

Russia offers another case of a state whose position in the balance of power has been markedly affected by the fortunes of its economy. Russia was probably Napoleonic France's most formidable military rival. Indeed, the Russian army played the key role in driving Napoleon from power between 1812 and 1815. There was even fear in the wake of France's collapse that Russia might try to dominate Europe.<sup>38</sup> But Russia did not make a run at hegemony after 1815. Instead, its position in the European balance of power declined over the next hundred years. As noted, Russia fought three wars against other great powers during that period and suffered humiliating defeats in each: the Crimean War, the Russo-Japanese War, and World War I.

A comparison of Russia's performance in the Napoleonic Wars, World War I, and World War II shows how weak Russia had become by 1914. Each conflict was dominated by a potential hegemon that invaded Russia. Napoleonic France and Nazi Germany were able to concentrate the bulk of their armies against Russia, although each had to maintain some forces in other theaters as well.<sup>39</sup> Nevertheless, Russia decisively defeated both of those aggressors. During World War I, however, Germany deployed approximately two-thirds of its fighting forces on the western front against the French and British armies, while the remaining one-third fought against the Russian army on the eastern front.<sup>40</sup> Although the German army was fighting the Russian army with its best hand tied behind its back, it still managed to defeat Russia and knock it out of the war, a feat that neither Napoleon nor Hitler could accomplish with both hands free.

Russia's decline reached its nadir in the years immediately after World War I, when Poland invaded the newly created Soviet Union and scored major victories.<sup>41</sup> The Red Army briefly turned the tide before the Poles regained the initiative and won a limited victory. Starting in the early 1930s, however, the Soviets began to build a formidable military machine,

which beat the Japanese army in a brief war in 1939, and then defeated the vaunted German Wehrmacht in World War II. The Soviet Union was so powerful after 1945 that only the United States could prevent it from dominating all of Europe. The Soviet Union remained a formidable military power for more than forty years after Hitler's defeat, until it broke apart into fifteen separate states in 1991.

The ups and downs in Russian military power over the past two centuries can be explained in good part by changes in Russia's position in the hierarchy of wealth. Although we do not have much data on the wealth of the great powers between 1800 and 1815, it seems clear that the United Kingdom and France had the most powerful economies in Europe.<sup>42</sup> Nevertheless, it does not appear that Russia was decidedly less wealthy than either the United Kingdom or France in those years.<sup>43</sup> But even if that were the case, the Russian economy was still able to support the Russian military in its fight against Napoleon, although Russia received subsidies from the United Kingdom at various points in the conflict. In short, there is no evidence that the French army had an important advantage over the Russian army because France was wealthier than Russia.<sup>44</sup>

Russia's position in the balance of wealth declined sharply over the seventy-five years following Napoleon's defeat (see Table 3.3), mainly because Russia industrialized much more slowly than did the United Kingdom, France, and Germany. Russia's lack of industrial might had important military consequences. For example, in the two decades before World War I, Russia could not afford to build large railroad networks in its western regions, which made it difficult for Russia to mobilize and move its armies rapidly to the Russo-German border. Germany, on the other hand, had a well-developed railroad system, so it could move its forces quickly to that same border. To rectify that asymmetry, France, which was allied with Russia against Germany, subsidized the building of Russian railroads.<sup>45</sup> In essence, by the eve of World War I, Russia was a semi-industrialized state about to go to war against a highly industrialized Germany.<sup>46</sup>

Not surprisingly, Russia's war economy could not support its army's needs. Rifle production was so woeful that in 1915, "only part of the army



**TABLE 3.3**

**Relative Share of European Wealth, 1816–1940**

	1816	1820	1830	1840	1850	1860	1870	1880	1890	1900	1910	1913	1920	1930	1940
<b>United Kingdom</b>	43%	48%	53%	64%	70%	68%	64%	59%	50%	37%	30%	28%	44%	27%	24%
<b>Prussia/Germany</b>	8%	7%	5%	5%	4%	10%	16%	20%	25%	34%	39%	40%	38%	33%	36%
<b>France</b>	21%	18%	21%	16%	12%	14%	13%	13%	13%	11%	12%	12%	13%	22%	9%
<b>Russia/Soviet Union</b>	19%	18%	15%	9%	7%	4%	2%	3%	5%	10%	10%	11%	2%	14%	28%
<b>Austria-Hungary</b>	9%	9%	7%	6%	7%	4%	5%	4%	6%	7%	8%	8%	—	—	—
<b>Italy</b>	—	—	—	—	—	—	0%	1%	1%	1%	2%	2%	3%	5%	4%

NOTE: “Wealth” here is a straightforward composite indicator that assigns equal weight to iron/steel production and energy consumption. Specifically, I determined the total amount of iron/steel that all the great powers produced for a given year, and then I calculated the percentage of that total accounted for by each great power. I performed a similar calculation for energy consumption. Then I averaged together each state’s percentages for iron/steel and energy. However, percentages for 1830–50 are based on iron/steel production alone because energy consumption data is unavailable. Note that the calculations of European wealth used here and throughout this book are based solely on figures for the relevant great powers and do not include minor powers such as Belgium and Denmark. Finally, note that Germany was Prussia before 1870.

SOURCES: All data are from Singer and Small, *National Material Capabilities Data*.

was armed, with others waiting for casualties to get arms."<sup>47</sup> Artillery was so lacking by as late as 1917 that Germany had 6,819 heavy pieces, while Russia had only 1,430. Jonathan Adelman estimates that at best only 30 percent of the Russian army's equipment needs were met during the war. Another way to look at Russia's problem is to consider the following comparisons for the period from 1914 through 1917:

- 1) Germany produced 47,300 airplanes; Russia produced 3,500.
- 2) Germany produced 280,000 machine guns; Russia produced 28,000.
- 3) Germany produced 64,000 artillery pieces; Russia produced 11,700.
- 4) Germany produced 8,547,000 rifles; Russia produced 3,300,000.

Thus, it is hardly surprising that less than half the German army was able to defeat the entire Russian army in World War I.

Stalin ruthlessly but effectively modernized the Soviet economy in the 1930s, so that by the start of World War II Germany enjoyed only a modest advantage in wealth over the Soviet Union (see Table 3.3).<sup>48</sup> Thus, the Soviet war economy was able to compete effectively with the German war economy in World War II. Indeed, the Soviets outproduced the Germans in virtually every category of military weaponry for the years from 1941 through 1945:

- 1) The Soviet Union produced 102,600 airplanes; Germany produced 76,200.
- 2) The Soviet Union produced 1,437,900 machine guns; Germany produced 1,048,500.
- 3) The Soviet Union produced 11,820,500 rifles; Germany produced 7,845,700.
- 4) The Soviet Union produced 92,600 tanks; Germany produced 41,500.
- 5) The Soviet Union produced 350,300 mortars; Germany 68,900.<sup>49</sup>

No wonder the Red Army defeated the Wehrmacht on the eastern front.<sup>50</sup>

Although the Soviet economy suffered enormous damage in World War II (see Table 3.4), the Soviet Union emerged from that conflict with the most powerful economy in Europe.<sup>51</sup> Not surprisingly, it had the military might in the late 1940s to dominate the region. But the United States, which was far wealthier than the Soviet Union (see Table 3.5), was determined to prevent the Soviets from becoming a European hegemon. In the first three decades after World War II, the Soviet economy grew rapidly as it recovered from that war, and the wealth gap with its bipolar rival narrowed considerably. It appeared that General Secretary Nikita Khrushchev's boast in 1956 that the Soviet Union would "bury" the United States might prove true.<sup>52</sup>

**TABLE 3.4**  
**Relative Share of European Wealth, 1941–44**

	1941	1942	1943	1944
<b>United States</b>	54%	58%	61%	63%
<b>Germany</b>	22%	23%	23%	19%
<b>Soviet Union</b>	12%	7%	7%	9%
<b>United Kingdom</b>	9%	9%	9%	9%
<b>Italy</b>	3%	3%	—	—

NOTE: "Wealth" is measured with the same composite indicator used in Table 3.3, save for the fact that I use energy production here instead of energy consumption. Although the United States is not a European power, it is included in this table because it was deeply involved in the fighting in Europe during World War II.

SOURCES: Energy and steel figures for the United States are from B. R. Mitchell, *International Historical Statistics: The Americas, 1750–1988*, 2d ed. (New York: Stockton Press, 1993), pp. 356, 397. The figures for the United Kingdom and Italy are from B. R. Mitchell, *International Historical Statistics: Europe, 1750–1988*, 3d ed. (New York: Stockton Press, 1992), pp. 457–58, 547. The figures for the Soviet Union are from Mark Harrison, *Soviet Planning in Peace and War, 1938–1945* (Cambridge: Cambridge University Press, 1985), p. 253. The German figures require explanation, because the numbers one uses depend on what territory is considered part of Germany. There are roughly three choices: 1) "older Germany," which covers the pre-1938 borders; 2) "greater Germany," which includes Austria, the Sudetenland, and territories conquered in the war, such as Alsace-Lorraine and the Polish

regions of Olsa and Dombrowa, all of which were incorporated into the Third Reich; and 3) "greater Germany plus the occupied states" that Germany exploited for gain. On these distinctions, see United States Strategic Bombing Survey (USSBS), *The Effects of Strategic Bombing on the German War Economy*, European War Report 3 (Washington, DC: USSBS, October 31, 1945), p. 249. Also see Patricia Harvey, "The Economic Structure of Hitler's Europe," in Arnold Toynbee and Veronica M. Toynbee, eds., *Hitler's Europe* (Oxford: Oxford University Press, 1954), pp. 165–282. For German steel production between 1941 and 1945, I used the relevant figures for the third category above, which are from USSBS, *Effects of Strategic Bombing*, p. 252. However, reliable energy production figures for Germany for the World War II years are difficult to find. See *ibid.*, p. 116. Using Soviet sources, Jonathan Adelman estimates the total amounts of electricity and steel produced by Germany and the Soviet Union during World War II. Adelman, *Prelude to the Cold War: The Tsarist, Soviet, and U.S. Armies in the Two World Wars* (Boulder, CO: Lynne Rienner, 1988), p. 219. Since Adelman's figure for German steel production (133.7 million tons) is close to my total (127 million), I assume his electricity figure is reliable. To apportion energy on a yearly basis, I simply applied the steel ratio for each year. For example, if 27 percent of German steel produced during the war was produced in 1943, I assume that 27 percent of all electricity was produced in that year, as well.

TABLE 3.5

## Relative Share of Superpower Wealth, 1945–90

	1945	1950	1955	1960	1965	1970	1975	1980	1985	1990
<b>United States</b>	84%	78%	72%	67%	67%	65%	63%	65%	66%	68%
<b>Soviet Union</b>	16%	22%	28%	33%	33%	35%	37%	35%	34%	32%

NOTE: Figures for 1945, 1950, and 1955 are based on the same composite indicator used in Table 3.3.

SOURCES: All data for 1945–55 are from Singer and Small, *National Material Capabilities Data*. Figures for 1960–90 are based on gross national product (GNP) data from the U.S. Arms Control and Disarmament Agency's *World Military Expenditures and Arms Transfer Database*. It should be noted that there is still uncertainty and disagreement among experts about the actual size of the Soviet Union's GNP during the period 1945–91. In my opinion, however, this is the best available data.

However, the Soviet economy began to falter in the early 1980s because it was not keeping pace with the American economy in developing computers and other information technologies.<sup>53</sup> This problem did not manifest itself in an abrupt drop in GNP relative to the United States, although Soviet leaders expected that over the long term. They also recognized that this incipient technological backwardness would eventually

hurt the Soviet military as well. Marshal Nikolai Ogarkov was dismissed as the chief of the Soviet general staff in the summer of 1984 for saying publicly that Soviet industry was falling badly behind American industry, which meant that Soviet weaponry would soon be inferior to American weaponry.<sup>54</sup> Soviet leaders recognized the gravity of the situation and tried to fix the problem. But their economic and political reforms went awry, touching off a crisis of nationalism, which not only allowed the United States to win the Cold War but shortly thereafter led to the dissolution of the Soviet Union.

This discussion of the importance of wealth for building military power might suggest that the distribution of latent power among states should roughly reflect the distribution of military power, and therefore it should be feasible to equate the two kinds of power. My argument that great powers aim to maximize their share of world power might reinforce that notion, since it seems to imply that states will translate their wealth into military power at roughly the same rate. But that is not the case, and thus economic might is not always a sound indicator of military might.

### **THE GAP BETWEEN LATENT POWER AND MILITARY POWER**

**T**he alliance patterns that formed during the Cold War illustrate the problems that arise when wealth is equated with military power. The United States was much wealthier than the Soviet Union from the start to the finish of that conflict, but that was especially true between 1945 and 1955, when the North Atlantic Treaty Organization and the Warsaw Pact were formed (see Table 3.5). Yet the United Kingdom, France, West Germany, and Italy in Europe, and Japan in Asia, opted to join an American-led coalition aimed at containing the Soviet Union. If wealth were an accurate measure of power, those less powerful states should have joined forces with the Soviet Union to check the United States, not the other way around. After all, if wealth is the metric for assessing power, the United States was clearly the mightier superpower.<sup>55</sup>

Power realities do not always reflect the hierarchy of wealth, for three reasons. First, states convert varying portions of their wealth into military might. Second, the efficiency of that transformation varies from case to case, occasionally with important consequences for the balance of power. And third, great powers buy different kinds of military forces, and those choices also have implications for the military balance.

### **Diminishing Returns**

Wealthy states sometimes do not build additional military forces—even though they could in principle afford them—because they recognize that doing so would not give them a strategic advantage over their rivals. Spending more makes little sense when a state’s defense effort is subject to diminishing returns (that is, if its capabilities are already on the “flat of the curve”) or if opponents can easily match the effort and maintain the balance of power. If launching an arms race is unlikely to leave the initiator in a better strategic position, in short, it will sit tight and wait for more favorable circumstances.

The United Kingdom in the nineteenth century is an example of a state that hit the flat of the curve in terms of the military payoff from additional defense spending. Between 1820 and 1890, the United Kingdom was far and away the wealthiest state in Europe. It never controlled less than 45 percent of great-power wealth during those seven decades, and in the middle two decades of the century (1840–60), it possessed close to 70 percent (see Table 3.3). France, which was the United Kingdom’s closest competitor during those twenty years, never controlled more than 16 percent of European industrial might. No other European great power has ever enjoyed such an overwhelming economic advantage over its rivals. If wealth alone was a sound indicator of power, the United Kingdom would probably have been Europe’s first hegemonic power, or at least a potential hegemon that the other great powers would have had to balance against.

But it is apparent from the historical record that this was not the case.<sup>56</sup> Despite its abundant wealth, the United Kingdom did not build a military force that posed a serious threat to France, Germany, or Russia. Indeed,

the United Kingdom spent a much smaller percentage of its wealth on defense between 1815 and 1914 than any of its great-power rivals.<sup>57</sup> The United Kingdom was just another state in the European balance of power. Consequently, the other great powers never formed a balancing coalition to contain it, as happened with Napoleonic France, Wilhelmine Germany, Nazi Germany, and the Soviet Union.<sup>58</sup>

The United Kingdom did not raise a large army and attempt to conquer Europe because it would have faced huge problems trying to project power across the English Channel and onto the European continent. Large bodies of water, as discussed in the next chapter, tend to rob armies of offensive capability. At the same time, the stopping power of water made it especially difficult for any continental power to cross the channel and invade the United Kingdom. Thus, the United Kingdom wisely concluded that it made no strategic sense to build a large army that was of little utility for offense and unnecessary for defending the homeland.

The United States provides another example from the nineteenth century of a rich state maintaining a relatively small military establishment. The United States was wealthy enough by 1850 to qualify as a great power, but it is generally agreed that it did not achieve that exalted status until 1898, when it began building a muscular military that could compete with those of the European great powers.<sup>59</sup> This matter is discussed at greater length in Chapter 7. Suffice it to say here that the tiny American army notwithstanding, the United States was a highly expansionist state during the nineteenth century, pushing the European great powers back across the Atlantic Ocean and expanding its borders westward to the Pacific Ocean. The United States was bent on establishing hegemony in the Western Hemisphere, a goal it clearly had achieved by the start of the twentieth century.

The American military remained much smaller than its European counterparts during the latter half of the nineteenth century because it could dominate the hemisphere on the cheap. Local rivals such as the various Native American tribes and Mexico were outgunned by even a small U.S. army, and the European great powers were unable to confront the United States in a serious way. The Europeans not only had to devote sig-

nificant resources to defending their homelands from attack by each other, but projecting power across the Atlantic Ocean onto the North American continent was a difficult task.

Another reason that states sometimes keep a lid on their military budgets is that they conclude that aggressive defense spending is likely to be bad for the economy, which will ultimately undermine state power, since economic might is the foundation of military might. During the 1930s, for example, British policymakers kept a tight rein on defense spending despite facing multiple threats around the globe, because they feared that massive increases would wreck the British economy, which they referred to as the “fourth arm of defence.”<sup>60</sup> Similarly, the administration of President Dwight Eisenhower (1953–61) was dominated by fiscal conservatives who tended to see high levels of defense spending as a threat to the American economy. This was one of the reasons why U.S. defense spending was curtailed in the 1950s and why greater emphasis was placed on nuclear weapons. A nuclear-based strategy, it was believed, would provide the basis for a stable and fiscally viable defense policy for the long haul.<sup>61</sup>

Allies also affect the level of resources that a great power devotes to its defense. For sure, any two great powers involved in an intense security competition or fighting a war with each other are going to spend heavily on their military. But if one of those rivals has wealthy allies and the other does not, the state with rich friends will probably have to spend less on defense than its rival. During the Cold War, for example, the Soviet Union committed a larger percentage of its wealth to defense than did the United States.<sup>62</sup> This asymmetry was due in part to the fact that the United States had wealthy allies such as the United Kingdom, France, Italy, and especially West Germany and Japan. The Soviet Union, on the other hand, had impoverished allies such as Czechoslovakia, Hungary, and Poland.<sup>63</sup>

Finally, there are those cases in which a wealthy state cannot build powerful military forces because it is occupied by a great power that wants it to remain militarily weak. Austria and Prussia, for example, were each defeated and knocked from the ranks of the great powers by France during the Napoleonic Wars, and France was occupied by Nazi Germany from



mid-1940 until the late summer of 1944, when it was finally liberated by British and American troops. The United States maintained troops in West Germany and Japan during the Cold War, and although it was surely a benevolent occupier, it did not allow either of its allies to build the requisite military might to become a great power. The United States preferred to keep Japan at bay, even though Japan was about as wealthy as the Soviet Union by the mid-1980s, if not sooner. Indeed, the available evidence indicates that Japan had a larger GNP than the Soviet Union's by 1987.<sup>64</sup> This case shows that although all great powers are wealthy states, not all wealthy states are great powers.

### **Different Levels of Efficiency**

It is also unwise to liken the distribution of economic might with the distribution of military might because states convert their wealth into military power with varying degrees of efficiency. Indeed, there is sometimes a large efficiency gap between rival great powers that has a marked effect on the balance of power. The fight to the death between Nazi Germany and the Soviet Union in World War II illustrates this point.

Germany controlled some 36 percent of European wealth by 1940, while the Soviet Union possessed about 28 percent (see Table 3.3). In the spring of 1940, Germany conquered Belgium, Denmark, France, the Netherlands, and Norway and immediately began exploiting their economies, adding to its wealth advantage over the Soviet Union.<sup>65</sup> The Wehrmacht then invaded the Soviet Union in June 1941, and within six months Germany controlled almost all Soviet territory west of Moscow, which was prime real estate. By late 1941, the Soviet Union had lost territory that held 41 percent of its railway lines, 42 percent of its electricity-generating capacity, 71 percent of its iron ore, 63 percent of its coal, and 58 percent of its capacity to make crude steel.<sup>66</sup> In the spring of 1942, the Nazi war machine further extended its reach by driving deep into the oil-rich Caucasus region. The Soviet Union lost roughly 40 percent of its national income between 1940 and 1942.<sup>67</sup> Germany appears to have held more than a 3:1 advantage in economic might over the Soviet Union by 1942 (see Table 3.4).

Despite Germany's profound advantage in latent power, the Soviet war economy amazingly outproduced the German war economy over the course of the war and helped shift the balance of power in the Red Army's favor. As described earlier, the Soviet Union produced 2.2 times as many tanks as Germany and 1.3 times as many airplanes between 1941 and 1945. What is most astonishing is that the Soviets even outproduced the Germans in the early years of the war, when German control of Soviet territory was at its peak and the Allied bombing campaign was having barely any effect on the German war economy. The Soviet Union, for example, produced 24,446 tanks in 1942; Germany produced 9,200. The ratio of artillery pieces for 1942 was 127,000 to 12,000 in the Soviets' favor.<sup>68</sup> This asymmetry in weapons production eventually led to a significant Soviet advantage in the balance of ground forces. When Germany invaded the Soviet Union in June 1941, the Soviets had a slight advantage in number of divisions—211:199—the key indicator of military strength. By January 1945, however, there were 473 Soviet divisions and only 276 German divisions, and the average Red Army division was far better equipped with weapons and vehicles than the average Wehrmacht division.<sup>69</sup>

How did the Soviet Union manage to produce so much more weaponry than a far wealthier Nazi Germany? One possible answer is that the Soviet Union spent a larger percentage of its available wealth on the military than did the Third Reich. But in fact Germany devoted a slightly larger percentage of its national income to defense than did the Soviet Union. The German advantage in defense spending over the Soviets in 1942, for example, was 63 to 61 percent; in 1943 it was 70 to 61 percent.<sup>70</sup> The Allies' strategic bombing campaign might well have hurt German war production in the last months of the war, but as noted above, the Soviet Union was turning out greater numbers of weapons than Germany long before the bombing campaign began to have any significant effect on German output. The Soviet effort was also helped by the U.S. Lend-Lease program, although that aid accounts for only a small percentage of Soviet output.<sup>71</sup> The main reason that the Soviet Union produced so many more weapons than Germany is that the Soviets did a much better job of rationalizing their economy to meet the demands of total war. In particular, the

Soviet (and American) economy was far better organized than the German economy for mass producing weaponry.<sup>72</sup>

### **Different Kinds of Military Forces**

The final reason why wealth is not a reliable indicator of military might is that states can buy different kinds of military power, and how they build their armed forces has consequences for the balance of power. This matter is discussed at length in the next chapter. The key issue here is whether a state has a large army with significant power-projection capability. But not all states spend the same percentage of their defense dollars on their army, and not all armies have the same power-projection capabilities.

During the period from 1870 to 1914, for example, when great powers spent their defense dollars on either their army or their navy, the United Kingdom earmarked a significantly larger share of its military budget to its navy than did either France or Germany.<sup>73</sup> These different patterns of defense spending made good strategic sense, since the United Kingdom was an insular state that needed a large and powerful navy to protect its seaborne commerce and to transport its army across the large bodies of water that separated it from the European continent as well as the vast British empire. France and Germany, on the other hand, were continental powers with much smaller empires, so they were less dependent on their navies than was the United Kingdom. They were also more dependent on their armies than the United Kingdom, however, because they had to worry constantly about an invasion by a neighboring state. The United Kingdom was much less concerned about being attacked, because it was separated from the other European great powers by the English Channel, a formidable barrier to invasion. Consequently, the United Kingdom had a much smaller army than did either France or Germany.

Furthermore, the small British army had little power-projection capability against the other European great powers, because the same geographical obstacle that made it difficult for rivals to invade the United Kingdom made it difficult for the United Kingdom to invade the continent. Kaiser Wilhelm summed up the U.K. military weakness when he

said to a British visitor in 1911, "Excuse my saying so, but the few divisions you could put into the field could make no appreciable difference."<sup>74</sup> In short, the United Kingdom was not as powerful as either France or Germany during the forty-four years before World War I, even though it was wealthier than France for that entire period, and wealthier than Germany for roughly three-quarters of that time (see Table 3.3).

It should be apparent that there are sometimes important differences in how wealth and power are distributed among the great powers, but that those incongruities are not caused by states passing up opportunities to maximize their share of world power. For sound strategic reasons, states build different kinds of military establishments, and they expend different amounts of their wealth on their fighting forces. Moreover, states distill military power from wealth at varying levels of efficiency. All of these considerations affect the balance of power.

Thus, although wealth is the foundation of military might, it is impossible to simply equate wealth with military might. It is necessary to come up with separate indicators of military power; the next chapter takes on this task.