MEASURING POWER, POWER CYCLES, AND THE RISK OF GREAT-POWER WAR IN THE 21ST CENTURY

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Measuring Global Power

The Trump administration’s 2018 National Defense Strategy signals that great-power competition has supplanted terrorism as the primary focus of U.S. defense planning. This reflects a growing concern in recent years that U.S. power, particularly its military power, has been declining relative to the growing global power of Russia and China. This concern renews longstanding questions about how we should measure international power, which nations have the most power, which states are gaining and losing power, and when such shifts in relative or perceived power might portend conflict between major powers. In this report, we explore these questions, illustrating a quantitative, scenario-based approach for policymakers who are interested in measuring the interstate balance of power, assessing the impact of shocks on the balance of power, and identifying periods during which shifts in the balance of power could potentially portend conflict between major powers. There are different theories that describe conditions under which the balance of power could increase the threat of conflict. We use one such theory—power cycle theory—to illustrate how the approach presented in this analysis can be used to quantitatively assess the balance of power and associated risks in a systematic way across a variety of potential future scenarios. Policymakers could use this approach to assess which nations have the most power and then identify—and attempt to avoid—risky scenarios.

The approach we illustrate in this report, as well as the theories on which it is built, focus on great-power wars: conflicts that involve intense and direct combat between major powers. The ability to identify and avoid these conflicts is particularly important because the stakes of these wars are high. They involve significant potential changes to the global order, and participants mobilize their societies to bring all elements of power to bear. These wars are not simply fought with the weapons on hand when they start. Great-power wars, fortunately, are rare events. It has been more than 70 years since the last great-power war ended in 1945. There have been even longer periods between great-power wars; there were 99 years between the end of the Napoleonic Wars and the start of World War I (WWI). While great-power wars are rare, their consequences are dramatic. The combination of full mobilization and intense competition between powerful states leads to very high death tolls and widespread destruction. For example, Figure 1 illustrates that battle deaths during great-power wars dwarf those from other interstate conflicts.

The consequences of major wars between great powers go beyond the deaths of soldiers and civilians. Wars of this magnitude can lead to major changes in the international system. WWI led to the breakup of the Ottoman and Austro-Hungarian Empires and the creation of new states in the Middle East and Eastern Europe, for example. World War II (WWII) led to the

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creation of the United Nations (UN) and a U.S.-led economic order based on trade and economic liberalization. Defeat in these wars can have grave consequences; the Ottoman Empire disintegrated because of WWI, Germany was partitioned and occupied for decades after WWII, and Japan shifted from imperial rule to a constitutional monarchy.

After a post–Cold War hiatus, there has been growing concern in the past decade that competition between the great powers could lead to a major war in the next decade or two. This concern underscores the importance of finding ways to anticipate—and avoid—great-power conflict. This analysis explores one approach to this problem based on the balance of power.

Political scientists, economists, and international relations theorists have yet to agree on the most meaningful metrics for understanding—let alone forecasting—the balance of power. Competing views on how to define, measure, and interpret global power are based on different assumptions that lead to different conclusions about the implications of the global balance of power. Over the past 70 years, the United States has wrestled with competing prophecies of declinism and triumphalism. These assessments were generally wrong. Sputnik did not, in fact, presage the Soviets winning the Space Race. The energy crises of the 1970s did not spell the end of American prosperity. Predictions of Japan as Number One evaporated after the collapse of Japan’s asset bubble in the mid-1990s was followed by two decades of economic stagnation. Claims in the 1990s that the United States had led the world into a new era of stability collapsed along with the World Trade Center in 2001. Today, the United States is experiencing record prosperity yet is once again uneasy about its place in the world. China’s sustained economic and military growth has raised concerns about whether the United States can maintain its military and economic dominance. The simultaneous deterioration of the U.S.-Russia relationship has also raised concerns about a costly military competition. The reemergence of power politics and spheres of influence harks back to dangerous eras of history when major powers engaged in brinksmanship and overt and proxy conflicts on multiple continents.

A particular focal point of the concern over renewed great-power competition relates to Sino-American competition and whether China’s rise means that the two states are destined for war. Despite this focus on the rise of China, however, we do not have a reliable way to measure China’s power relative to U.S. power. As this report shows, the
The perceived balance of power depends on assumptions about how components of power are measured and assumptions about how power is defined in the first place. For this reason, there is much to be gained from a framework that not only assesses power using a clear set of well-defined assumptions but that allows researchers the flexibility to compare the implications of trading one set of assumptions for another set. This research develops such a framework and applies it to three alternative assumptions about future economic, demographic, and climate outcomes.

The Role of Perspective

To illustrate the challenge, we present three ways of comparing the size of the U.S. and Chinese economies, showing that each perspective tells a different story. Figure 2 shows what many may think of when they hear that China will soon eclipse the United States. It shows the gross domestic product (GDP) of each country, measured using purchasing power parity (PPP). This choice of metric shows the exponential growth of China’s economy. Its GDP doubled between 2003 and 2008, and the global financial crisis of 2008 barely slowed China’s growth. In contrast, the United States plods along at a steady rate of growth, with a noticeable impact of the financial crisis in 2009. Through this lens, China’s GDP passed that of the United States in 2013 and continues to rocket away.

Figure 2 tells a story of relentless Chinese growth that leaves the United States lagging behind. But Figure 2 does not come close to telling the full economic story, in part because of how it measures GDP. When comparing two economies that use different currencies, one must develop a conversion factor. PPP measures use a common basket of goods to develop a relative price index. This is useful for comparing the standard of living between two countries. But American unease over China’s growth has less to do with the rising standard of living of the Chinese people and more to do with the potential of China channeling that economic growth into international influence, including through military force.10

The common basket of goods researchers generally use to calculate PPP measures may be less relevant to questions of latent military power.11 A haircut may be cheaper in Beijing than in Manhattan, but is an advanced fighter jet cheaper for the People’s Liberation Army (PLA) than for the U.S. Department of Defense? Fighter jets are not in the basket of goods...
used by the PPP, and the PLA still relies on foreign sources for some key high-tech components, such as jet engines.12

Figure 3 shows how the relative position of the United States and China appears through the lens of GDP compared using market exchange rates rather than PPP. This tells a very different story from Figure 2. Through this lens, China still had a period of exponential growth in the early 2000s, but the magnitude of this growth was significantly less. At market exchange rates, Chinese GDP grew faster than U.S. GDP between 2005 and 2015, but it did not catch U.S. GDP, nor is it clear whether China can maintain this rapid growth.

Even if the story of U.S. and Chinese GDP did not depend on the assumptions of the storyteller, no single statistic provides a complete basis for understanding the relative economic power of two large and complex economies. GDP is a measure of flow; it concerns the value of a country’s annual production but not its stock of wealth. We might think of GDP as a person’s salary. If we asked who had the highest salary in a given year, we’d get a very different answer than if we asked who had the most wealth in that year. It is even more complicated to measure a country’s wealth than its GDP, and only recently have researchers attempted to build frameworks to do so. One recent approach by a team from UN University has begun funding research into measuring what it calls “inclusive wealth,” an attempt to quantify a country’s human, physical, and natural capital.13 Figure 4 shows how the relative position of the United States and China appears from this perspective.

Through this lens, we would conclude that not only does the United States have a massive lead, but this lead grew in absolute terms between 1990 and 2010. In 1990, the United States had roughly $84 trillion more inclusive wealth than China, using the inclusive wealth metric; in 2010, it had roughly $111 trillion more.

These three measures of the economic balance between the United States and China lead to vastly different interpretations of economic power. One might ask which of these stories is true. The answer is that all of them are. Each is accurate within its scope; each illustrates a different dimension of a complex and multidimensional component of global power.

One might argue that none of the metrics presented above fully captures the complexity of a modern economy. For example, all three illustrations take Chinese-reported GDP figures at face value.

FIGURE 3

![Graph showing U.S. and China Real GDP at Market Exchange Rates, 1990–2017](image)

SOURCE: Data from International Monetary Fund, 2018.
There are many reasons to doubt the accuracy of official Chinese economic statistics, which could lead to yet another perspective on the relative economic sizes of China and the United States. And a nation’s economy represents just one element of global power. Diagnosing whether the United States is ahead of or behind China, and whether its position is stable or eroding, depends very much on the assumptions that go into the diagnosis.

Global Power Metrics

Researchers in various countries have proposed many potential metrics for measuring global power. In China, a small academic industry is now devoted to building measures of what it calls “comprehensive national power.” Some Chinese indices include dozens of variables. A Western example of a global power metric can be found in the Correlates of War project, which in 1963 developed a six-factor Composite Index of National Capability (CINC) that includes (1) total population, (2) urban population, (3) military personnel, (4) military expenditures, (5) primary energy consumption, and (6) iron and steel production. These demographic, industrial, and military indicators reflect the “breadth and depth of the resources that a nation could bring to bear in instances of militarized disputes.” The Correlates of War project has gathered data for the CINC from 1816 through 2012 for historical research on interstate wars. Consequently, the CINC has an industrial-age focus, using such indicators as energy consumption and iron and steel production to assess a nation’s industrial might that could, in wartime, be translated into military power. The CINC is perhaps the most widely used method of measuring national power; by one estimate, over 1,000 studies have employed it. However, analysts have noted that the CINC may not accurately reflect the current and future balance of power in the postindustrial age. One might argue that future power hinges on new factors, such as supercomputing power or prowess in research and development. The focus of the CINC on traditional and tangible measures of military power tends to neglect the important roles that technology and human capital play in contemporary military capabilities. Figure 5 illustrates how the three decades between 1980 and 2012 appear through the lens of the CINC and suggests why the CINC may not accurately reflect the balance of power in the postindustrial age. According to the CINC, the Soviet Union was the most powerful state until 1989 and China surpassed the United States in 1995, neither of which seems plausible.

To respond to the challenge of measuring power in the postindustrial or information age, researchers have developed new ways of measuring global power that extend industrial-age measures, such as the CINC. One such measure is the Global Power Index (GPI), developed under the auspices of the National Intelligence Council (NIC). The GPI includes measures of the military, economic, technological, political, and demographic capacity of nations. Unlike industrial-age indices like the CINC, the GPI includes nuclear weapons as a factor in the military capacity of a state, trade as a factor in the economic capacity of a state, research and development (R&D) expenditures as a measure of technological capacity, government revenues as a measure of political capacity, and working-age population (rather than total population) as a measure of labor capacity.

The full GPI has six distinct periods during which the elements of power and the weights on those
elements change. It also measures a state’s share of power relative to the rest of the world (a denominator of 186 countries). The International Futures (IF) model maintained at the University of Denver’s Pardee Center for International Futures has incorporated the GPI into its modeling framework and used the IF model to create forecasts to 2050.\textsuperscript{22} The IF model includes feedback loops between disparate factors in an attempt to reflect systemic effects; all of these feedback loops involve input parameters that modelers must set to try to match reality. Figure 6 illustrates how the period between 1980 and 2012 appears through this lens. Here we see a more intuitive and plausible story. During the last decade of the Cold War, the Soviet Union was the second-most-powerful state after the United States, until the fall of the Soviet Union in 1991 caused it to become less powerful than Japan. Japan remained the second-most-powerful state until 2004, when China passed it.

For this report’s illustrative effort, we wanted a more transparent way to create alternative scenarios, which prevented us from using the full GPI. The modified GPI presented here uses a subset of the full GPI’s measures and weights, a smaller set of countries as the denominator, and scenarios built by aggregating the individual elements of our modified GPI measures. Table 1 summarizes the elements and weights of the modified GPI. While distinct from the full GPI, our modified GPI is more consistent with standard views of the distribution of power in the 21st century than is the main alternative methodology (the CINC). While we used independent data sources and spreadsheets to aggregate data, the resulting picture is closer to the full GPI view than the CINC is and seems broadly more consistent with our understanding of the past 30 years of history—certainly more consistent than the picture offered by the CINC.

When considering how to measure a nation’s power, researchers must decide whether to focus on absolute or relative capabilities. The proper modeling choice depends on the purpose of the model. When considering inherently competitive questions, such as the risk of warfare between states, relative measures of power are particularly informative. In other cases, such as when considering nations’ abilities to provide health and economic opportunities to their citizens, absolute levels are more informative than relative ones. Investigations of the balance of power between

\begin{figure}
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\caption{Balance of Power, 1980–2012, Measured Using CINC}
\includegraphics[width=\textwidth]{figure5.png}
\label{fig:5}
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\textsuperscript{SOURCE: Data from Singer, Bremer, and Stuckey, 1972.}
FIGURE 6
Balance of Power, 1980–2012, Measured Using Full GPI

SOURCE: Data from Moyer and Markle, 2017.

Table 1
Elements and Weights of the Modified GPI Used in This Report

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Indicator</th>
<th>Weight</th>
<th>Measure</th>
<th>Source</th>
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</thead>
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<tr>
<td>Military capacity</td>
<td>Nuclear weapons</td>
<td>5</td>
<td>Logarithm of number of warheads</td>
<td>Federation of American Scientists Nuclear Notebook, 2019</td>
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<tr>
<td></td>
<td>Military power</td>
<td>20</td>
<td>Military expenditures</td>
<td>Stockholm International Peace Research Institute, 2019(^a)</td>
</tr>
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<td>GDP</td>
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<td>GDP (PPP)</td>
<td>Maddison Project Database, 2018</td>
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<td></td>
<td>Trade</td>
<td>15</td>
<td>Total trade (exports plus imports)</td>
<td>World Trade Organization historical trade data, 2019</td>
</tr>
<tr>
<td>Technological capacity</td>
<td>Innovation</td>
<td>10</td>
<td>Research and development expenditure</td>
<td>UN Educational, Scientific and Cultural Organization, 2019</td>
</tr>
<tr>
<td>Political capacity</td>
<td>Governance</td>
<td>15</td>
<td>Government revenues</td>
<td>International Centre for Tax and Development, 2019; World Trade Organization, 2019(^b)</td>
</tr>
<tr>
<td>Human capacity</td>
<td>Population</td>
<td>10</td>
<td>Working-age population(^c)</td>
<td>UN Population Division, 2019</td>
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</tbody>
</table>

\(^a\) We used data from the Correlates of War Project National Material Capabilities to fill in gaps for Russia and China pre-1988.

\(^b\) Start dates vary by country, with most countries’ data beginning in 1980. We use imputed missing revenues using linear regression analysis based on country fixed effects and an interaction between country fixed effects and changes in GDP.

\(^c\) Population between 15 and 64 years old.
major powers are typically focused on competitive challenges, so metrics like the GPI measure a state’s power relative to other states. The full GPI compares each state’s power to that of the world as a whole (a total of 186 countries). For our illustration in this report, we chose to use a smaller set. As an initial screening measure, we calculated the modified GPI for all 19 state members of the G20. We then focused our analysis on the eight countries with the highest GPI scores. Figure 7 shows the share of power among the states of the G20 in 2015. The United States had about 25 percent of the share of power, driven by its large economy and military spending. China follows, with about 20 percent of the share of power. These two states, combined with India, Russia, Germany, Japan, France, and the United Kingdom, have had more than 75 percent of the total power of the current G20 countries throughout the period of 1980 to 2017—again, measured by the modified GPI. Figure 8 shows that, in all three measures of power (the full GPI, modified GPI, and CINC), these eight countries have consistently represented a majority of power. Through all three lenses, these eight great

**FIGURE 7**
Balance of Power in 2015 of the G20, Measured Using Modified GPI

**FIGURE 8**
Combined Share of Global Power for United States, China, India, USSR/Russia, Germany, Japan, France, and the United Kingdom, Measured Using Full GPI, Modified GPI, and CINC, 1980–2010

powers possess the preponderance of power in the international system.

We use GPI as the metric of global power in our illustrative examples because of its pedigree (it is used by the NIC in some of its Global Trends reports) and because we assess that it is a more accurate measure of state capacity than are alternative methodologies. This modeling choice—an assumption—could certainly be replaced with an alternative or modified index. For example, one might consider adding other factors, such as metrics related to energy production, ability to project military force, or resilience to climate change.

Changes in Global Power over Time

Figure 7 provides a snapshot estimate of the balance of power at a single point in time. To inform discussions regarding how the balance of power has changed in the past and might change in the future, it can help to examine how these relative shares of power shift over time. Figure 9 shows how the relative share of power for the eight great powers (the United States, China, India, Russia, Germany, Japan, France, and the United Kingdom) has shifted from 1980 through 2017. If we look at 2015, we can see similar results to the snapshot provided in Figure 7; at that point in time, the United States had about 25 percent of the G20’s power, followed by China with about 20 percent. Comparing this view of the balance of power using our modified GPI with that provided by the full GPI in Figure 6, one can see that this is a larger share of power than China had in the full GPI (about 12 percent in 2012). This is because the modified GPI we use here omits some of the parameters included in the full GPI, on which China is relatively weaker. This once again illustrates how one’s choice of lens can affect perceptions of relative power and why we recommend explicitly examining how a different lens can change the narrative.

The methodology presented in this analysis could use either measure of power (and could even do an explicit sensitivity analysis comparing the two), but the rest of this report will use the modified GPI for purposes of illustration.

From this vantage point, the United States is still the most powerful country, but its edge has eroded. Looking over the past several decades, we can see...
Even though some scholars may view indicators of global power like the GPI as incomplete, these measures can provide useful insight into situations in which military force is the ultimate arbiter.

the impact of some major events, such as the precipitous decline of Russian power with the collapse of the Soviet Union. We can also see America’s relative dominance during the 1990s (what some scholars called its “unipolar moment”) and then China’s dramatic rise during the first 15 years of the 21st century. On a smaller scale, we can see Japan’s relative rise and fall and India’s climb into the No. 3 position circa 2007. In 2017, the United States remained the most powerful country, but by the smallest margin during this period. This perspective also shows that Russia’s overall share of power has remained quite stable and relatively small over the past 20 years. Short-term crises, such as the oil price spike in 2008, did not dramatically shift the long-term balance of power.

The modified GPI perspective in Figure 9 echoes the relative market exchange rate GDP perspective displayed in Figure 3, even though the GPI includes many more factors. China had a rapid period of relative growth in the 2000s, but that growth has begun to slow. The factors that contribute to the United States retaining an edge over China include its advantage in nuclear weapons and military expenditures.

This perspective suggests part of the reason why the United States may be currently experiencing a bout of declinism. In some elements of power, the United States has been eclipsed, and the margin between the United States and the next-most-powerful state is the smallest it has been in at least four decades. Historical fluctuations in the distribution of relative power can shape current perspectives.

Expectations of the future can also cast shadows onto the present, coloring how we perceive current events. If leaders feel that everything is going their way, then they may become more risk-averse, lest they accidentally alter their expected positive trajectory. Conversely, if leaders feel that they face an impending decline in power, then they might become more risk-acceptant and try to find a way to prevent or slow that decline. In the most extreme setting, research suggests that significant shifts in global power might create heightened tensions and sensitivities that increase the risk of major interstate war. While policymakers and commentators debate the scope and nature of American interests, most would agree that U.S. core interests include managing great-power competition and preventing major war. Even though some scholars may view indicators of global power like the GPI as incomplete, these measures can provide useful insight into situations in which military force is the ultimate arbiter.

Global Power Dynamics and Global Conflict

There are many models that link the distribution of global power to the prospects for major interstate war, according to different theories of why wars occur. Put broadly, when assessing whether one scenario is more stable than another, analysts apply a model (ranging from a heuristic to a formal model) to assess the prospects for crisis or war under different distributions of global power. One such approach would be to use a quantitative metric (such as the GPI) within a theoretical model that evaluates the likelihood of a war erupting under different distributions of global power.

There are many theoretical models that an analyst could use for this purpose. Among these models, power cycle theory represents an intriguing option due to its quantitative nature and its ability...
to operate on aggregated metrics, such as the GPI. *Power cycle theory* relates the relative distribution of power in the international system to the likelihood of major wars—that is, large wars that will reorder the international system.²⁹ For this reason, it focuses on *latent* indicators of military power. The theory concerns long-term shifts in power that take place over decades, rather than the year-to-year fluctuations in military capabilities that arise as states actualize their latent power by fielding new weapon systems, testing new technologies, or training their militaries in new concepts of operation. Power cycle theory posits that the largest wars—measured by duration and number of casualties—tend to occur when multiple great powers simultaneously experience *critical points* at which their relative rates of growth fundamentally shift. These major wars are also sometimes called *extensive* wars because they involve multiple major powers that fully mobilize, leading to a large number of casualties and restructuring of the international system. Scholars have found confirming evidence for the theory when testing it against the historical record as a whole and when examining case studies in specific major wars (such as WWI).³⁰ By focusing on fundamental elements of national power and the risk of wars that could reorder the international system, these sorts of frameworks can help strategists step back and look for structural shifts in power that can destabilize the international system. Of course, destabilizing shifts represent only one concern out of many that national security strategists confront on a daily basis—from terrorism and power vacuums to nuclear proliferation and transnational crime—but they are a necessary concern that requires attention and foresight. Power cycle theory, like all models, is a simplification of reality, but we judge that it has value in helping analysts understand the balance of power and prospects for major wars in a systematic and quantifiable way. We do not view it as a replacement for critical thinking, the study of history, regional expertise, or other methods. We consider it to be a valuable tool to add to the larger toolbox used by national security analysts and those concerned about how future trends could affect great-power competition and war.

There are many theories of warfare involving cycles.³¹ While each differs in particulars, they share some broad characteristics because they emphasize long-term causes of war. In these theories, uneven rates of growth among states play an important role in creating systemic disequilibria. Theories differ on which rates of growth matter most; some focus exclusively on economic growth, while others focus on broader indexes that include population. Theories also differ on what configurations of powers are the most dangerous; for example, transition theories focus on when a rising power’s capabilities approach those of the leading power in absolute terms, while power cycle theory focuses on when the trend in a nation’s growth changes (peaks, bottoms out, or reaches an inflection point). All theories generally accept the argument that a discrepancy between a state’s perceived status and its desired status influences its behavior. We use power cycle theory in this report because of its unambiguous and quantifiable character (the theory leads to specific predictions tied to quantitative conditions). Although we apply power cycle theory, we do so mainly as an illustration of how one can combine international relations theory with future balance-of-power scenarios to consider which ones may be more unstable than others; we encourage strategists to consider many lenses when evaluating scenarios.

**Power Cycle Theory**

To answer questions about whether a balance of power in a given scenario makes a major war more or less likely, one needs to apply a theory that relates certain configurations of power to predictions about stability. Power transition theory, for example, might focus on the period around 2023, when China’s modified GPI score surpasses that of the United States. Power cycle theory, however, suggests that the risk of war is higher when several major powers go through critical points at similar times—not when their shares of global power cross each other. As mentioned earlier, critical points occur when the direction or acceleration of a state’s relative growth trend changes, such as when a state’s power falls after reaching its zenith or rises after reaching its nadir.

Critical points may also occur when the *rate* of growth or decline accelerates or decelerates. For example, in our baseline scenario, Chinese relative
growth experiences an inflection point around 2011. Before 2011, Chinese relative growth was accelerating, in line with the economic trends that we discussed in the opening. After 2011, however, Chinese relative growth decelerates. While it is still growing in absolute and relative terms, its rate of relative growth slowed. Figure 10 highlights that, between 1990 and 2010, China’s relative power growth rate accelerated. After 2010, its relative power growth rate began decelerating. In the baseline scenario, its relative rate of growth continues to slow, but it does not peak. The point where China’s relative power growth rate stops accelerating and begins to decelerate (marked with the black dot in Figure 10) is a particular type of critical point called an inflection point, and it has special significance for a rising power.

Before the inflection point, time is on the side of the rising power. Rising powers have unrealized goals and aspirations. Before the first inflection point, however, the rising power has many incentives to be patient in achieving those goals and realizing its aspirations. If it waits, it will have more relative power in the future and therefore more bargaining leverage to achieve its goals. The strategy espoused by Deng Xiaoping, which is sometimes translated as hide and bide, reflects this sort of patient strategy.32

The first inflection point changes these incentives. When relative power growth begins to decelerate, the state’s leaders begin to experience the first reminders that their country will not rise indefinitely. Leaders start to make hard choices about whether it is time to start pursuing their goals more assertively before the window of opportunity closes. In China’s case, we have witnessed growing evidence since 2011 that China has abandoned Deng’s patient strategy and begun to act more assertively.33 Some in China argue that what has changed is the world’s reaction to China rather than China’s behavior.34 However, many analysts observed that, by 2010, China had begun to debate the hide and bide strategy.35 Since then, China has become significantly more assertive in pursuing its foreign policy goals. In 2013, China began a large-scale campaign to build artificial islands in the South China Sea to bolster its ability to enforce its claims there.36 In 2015, the China-led Asian Infrastructure Investment Bank (AIIB) began operation after several years of proposals and organization. The AIIB is seen by many as a potential rival to the World Bank and the International Monetary Fund, which China views as dominated by American, European, and Japanese interests. In 2016, China announced the creation of its first overseas military base in Djibouti. During a 2017 speech to the Chinese Communist Party Congress, President Xi broke with Deng’s strategy, saying “It is time for us to take center stage in the world” and calling China a “great power.”

Power cycle theory argues that it is not coincidence that a state’s foreign policy behavior would change as it passes through this sort of critical point. Other types of critical points are when its relative power peaks (an upper turning point), when a declining power’s rate of decline slows (the second inflection point), and when its relative power bottoms out and begins to rebound (the lower turning point). The theory argues that each type of critical point presents challenges for national leaders as they assess the country’s position and trajectory in the international system and decide how to adjust their policies to achieve their goals in a new environment.

Rising states tend to have role deficits as international institutions are slow to accommodate their growing power (for example, China’s complaints about an underrepresentation in the World Bank and International Monetary Fund or India’s push for a permanent seat on the UN Security Council) and give them commensurate influence; states on the decline tend to have capability deficits as their power...
erodes despite their maintaining prominent roles in institutions such as the UN Security Council (such as France and the United Kingdom retaining permanent seats on the UN Security Council). Research by Doran and Parsons suggests that when multiple great powers pass through critical points, the risk of miscalculation increases, and the systemwide risk of a major war increases. For example, Figure 11 shows that, in the years leading up to WWI, five major powers (Germany, Italy, Austria-Hungary, the United States, and France) all passed through critical points, and four were in their critical window—the period from three years before to seven years after the critical point.

Power cycle theory does not claim that these overlaps cause conflict but rather that they create conditions ripe for major conflict, similar to the buildup of dry kindling increasing the risk of a major forest fire. The key idea is about expectations; countries are more likely to reassess their role in the global order or be unusually sensitive to challengers when the trajectory of their share of global power changes: Their share of global power starts to decline, their share of global power starts to rise, their rate of global power increase (or decrease) starts to slow, or their rate of global power increase (or decrease) starts to speed up. Several major powers going through such periods at the same time does not guarantee a war between these countries but increases the risk of such a conflict.

To be clear, power cycle theory does not predict how individual leaders will respond to these critical periods. Rather, it suggests that critical periods are important environmental factors that shape the perceptions, incentives, and policy choices of individuals. These factors can affect leaders, as well as their constituencies. Research suggests that, during periods around a critical point, it is more difficult for leaders to make accurate assessments of the relative balance of power, increasing the risk of miscalculation, including the risk of underestimating an opponent’s willingness to fight. The combination of this uncertainty and a heightened sense of urgency contributes to the increased risk of armed conflict.

As we noted earlier, power cycle theory is just one lens that analysts can use to assess the risk of war in the alternative scenarios. An alternative lens would be power transition theory. One perspective on power transition theory posits that the risk of war increases when the ratio of the established power’s capacity (in this case, the United States) to the rising power’s capacity (in this case, China) falls below two. In the

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**FIGURE 11**
States in Critical Window, by Year, During the Lead-Up to World War I, 1900–1920

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**SOURCE:** Data from Tessman and Chan, 2004, and Doran, 1991.
baseline case of the balance of power using the modified GPI summarized in Figure 9, China breached this threshold in 2007, so by that measure the power transition had already begun, and therefore this example does not meaningfully diverge from the baseline case.41

Scenario Thinking

As discussed earlier, it is difficult to diagnose the current balance of power. As we consider future scenarios, these difficulties compound. Despite these challenges, there are potential benefits to considering future scenarios. A major benefit of scenario thinking is to help analysts and policymakers quickly recognize when fundamental conditions have changed, requiring a different policy response. Another prominent use of scenarios in policy analysis involves developing adaptive strategies to handle a wide range of potential futures.42 Scenario thinking is also a fundamental way to handle uncertainty in defense analysis.43

A classic example of how scenario-based planning can enable quicker recognition of fundamental changes and more perceptive reactions to them can be found in Shell Oil’s experience in the 1960s and 1970s.44 In the 1960s, Shell engaged in a scenario planning exercise in which executives considered a range of alternative futures. In one of these futures, oil supply suddenly contracted. The executives thought through the second-order effects of this shock, including how the resulting price spike would lead to demand destruction in the medium term, meaning that oil refining capacity would not need to expand as quickly as it had since the early 1950s. When the 1973 oil embargo hit, Shell executives remembered the scenario planning exercise and the second-order implications of the price spike. Shell moved to quickly reduce its refining capacity, enabling it to avoid costly excess capacity when oil demand dropped in the following years. In contrast, the oil industry as a whole kept adding refining capacity at the same rate for two years, and industry-wide refining capacity did not stop growing until 1980. To be clear, the Shell scenario planning exercise did not predict the Yom Kippur War or the following 1973 oil crisis. The exercise did help Shell executives recognize a fundamental change before their competitors, enabling a quicker and more effective response. This example highlights another benefit of scenario thinking: It does not require perfect foresight or prediction.

A full scenario planning exercise is beyond the scope of this report. Instead, we designed examples that explicitly show the flexibility of our framework to support a broader scenario planning exercise.

We begin by constructing a baseline scenario of a future balance of power, measured using the modified GPI. For each element of the GPI, we constructed a baseline projection out to 2040.45 Table 2 describes how we projected each element of the GPI to construct this baseline scenario. After describing this baseline scenario, we illustrate how alternative projections may or may not alter conclusions about the risks identified by power cycle theory. Specifically, for completeness, we illustrate the impact of altering the projection of one measure for one country, one measure for all countries, and multiple measures for multiple countries.

Figure 12 summarizes how the balance of power shifts in the baseline scenario. We can see that the baseline assumptions, which include sustained Chinese GDP growth that gradually moderates, lead to China steadily continuing to gain power relative to the United States. This scenario means that China shakes off the temporary pause (circa 2015) in its relative rise that we noted when we introduced the modified GPI in Figure 9. While China continues to gain power relative to the United States in this scenario, it does so at a slower rate than it did during the meteoric Chinese expansion from 2000 to 2015. We can also see that this scenario includes a steady growth in Indian power, with India emerging as the clear third-most-powerful state. Japan’s relative power remains stable, and Russia’s relative power continues to erode.

Assessing Future Scenarios

A benefit of this framework is that we can compare the risk of conflict predicted in the baseline scenario with the risk of conflict predicted in alternative scenarios. We constructed three illustrative examples by making different assumptions about what the future might look like. As long as alternative assumptions
can be articulated in ways that have quantifiable implications for nations’ share of global power, we can use power cycle theory to describe the risk of conflict in alternative scenarios in comparison with the baseline scenario.

We illustrate the flexibility of this approach using three illustrative examples, as listed in Figure 13. The first example, “Chinese Lost Decade,” uses an alternative assumption about a single GPI factor, GDP, for a single country, China. The second example, “Rapid Global Population Increase,” uses an alternative assumption about a single GPI factor, population, for many countries. The third example, “SSP2 Climate Change,” looks at one of five commonly used collections of assumptions about the future implied by climate change, called the shared socioeconomic pathways (SSPs), that results in changes to GDP and population for many countries. In particular, we use the second SSP, known as SSP2 or the “Middle of the Road–Intermediate Challenges” scenario. These illustrative examples were chosen in part for their political and economic relevance and in part for their ability to demonstrate the flexibility of this methodology.

**Illustrative Example 1: Chinese Lost Decade**

The Chinese Lost Decade example considers the implications of China experiencing a decade of slower economic growth than is currently forecast. Some
scholars argue that expectations for China’s future growth are overstated and that events will eventually transpire to cause a drastic slowdown in the Chinese economy, followed by a period of more-modest growth.\(^{46}\) We can examine how such an example differs from the baseline scenario by replacing baseline GDP forecasts of China’s economic growth (which are based on OECD forecasts) with a 1-percent growth rate from 2020 to 2030 and a 3-percent growth rate from 2031 to 2040. Other elements of the GPI are not changed directly, although because government revenue and R&D spending are forecast as a fraction of GDP, the changes in GDP also change the total amount of government revenue and R&D spending. Alternative assumptions involving feedback loops between Chinese GDP and other elements of China’s GPI could be implemented but are not necessary for our illustrative purposes. This illustration also does not include any feedback loops between the change in Chinese economic growth and other countries’ economic growth, which is another factor that should be considered in a full application of this approach.

Figure 14 shows how GPI shifts under this alternative assumption for the eight major powers.\(^{47}\) Unsurprisingly, China’s power falls, and, since GPI is a relative measure, other countries’ share of global power rises. These gains are most notable for the United States and India.

Is the risk of global conflict greater in the Chinese Lost Decade example or the baseline scenario? If one uses the lens of power cycle theory, then multiple major powers going through critical points around the same time increases the risk of global conflict, and the location of countries’ critical points can shift under different assumptions about the future. Figures 15 and 16 show the alignment of
critical points in the baseline and in the Chinese Lost Decade example. For each critical point, we consider a window starting three years prior to the year of the critical point and seven years after the year of the critical point, for a total of an 11-year (inclusive) window. This window represents a period during which the state must wrestle with the challenges of the changing trends and expectations created by the critical point. The size of the window is based on power cycle theory research, but alternative assumptions could easily be applied.
First, the figures remind us that critical points are rare events. They represent identity crises on a national scale—hence, not something that happens regularly. The baseline scenario shows no sign of critical points on the horizon (to 2040) for any of the eight largest powers. China and Japan are both emerging from the end of their critical point windows—China’s caused by a realization that its rapid growth is slowing, and Japan’s caused by stabilization after years of relative decline. Otherwise, the baseline scenario could be viewed as showing a “business as usual” future.

There are a few notable changes in the Chinese Lost Decade example in Figure 14. The United States experiences a critical point in the early 2020s, around the start of the Chinese economic crisis, as China’s decline slows the decline in U.S. relative power. As for China, the economic slowdown itself does not trigger a critical point because the Chinese economy had already been slowing (albeit at a calmer rate). However, China does experience a critical point as it emerges from the economic crisis because the rate at which China gains relative power begins to increase again. In the assumptions of this example, the two critical windows overlap slightly, creating a period in which the two largest powers are both reassessing their role in the world, increasing the risk of global conflict.

**Illustrative Example 2: Rapid Global Population Increase**

The Rapid Global Population Increase example considers the implications of different assumptions about future fertility rates. The baseline scenario uses the “medium variant” of the UN’s forecast for population ages 15 to 64. In this example, we replace the UN’s medium variant population forecast with assumptions of a higher global population growth rate—the UN’s “high variant” population forecast. Specifically, for all countries, we replace the median population forecast for ages 15 to 64 with the upper 95th percentile from the same UN forecast. Although the magnitude varies slightly from country to country, all countries see an increase in forecast working-age population relative to the medium variant in the baseline. Figure 17 shows the resulting modified GPI scores; we find in this case...
that this alternative assumption about global fertility rates makes no noticeable difference in the relative GPI. The same story is true if we use the bottom 95th percentile of the population forecast. This is a largely intuitive result—because GPI is a relative measure, there is no noticeable change when all countries face a similar shock that moves all the countries in the same direction. If one country, such as the United States, maintained higher population growth while the other major powers suffered population declines, then we would expect to see a shift in the GPI. This is a useful example because it reminds us that there are cases where, at least under the assumptions of power cycle theory, alternative assumptions do not significantly alter the probability of major-power conflict. Even extreme assumptions about global demographic trends make little difference in this assessment of risk because GPI is a relative measure.

Illustrative Example 3: SSP2 Climate Change

The SSP2 Climate Change example considers the implications of replacing the GDP and population projections from the baseline scenario with GDP and population projections associated with standard climate change assumptions. Projections of how GDP and other outcomes will be affected by climate change depend on assumptions about future decisions by governments, institutions, and the general population, including assumptions about the probability of future conflict. There are five commonly used collections of assumptions about these future decisions, called the SSPs. These SSPs were constructed by a global consortium of climate scientists to provide a common set of assumptions for discussing and researching the impacts of climate change.50 SSPs are the global standard for this purpose and are being incorporated into the Intergovernmental Panel on Climate Change’s sixth assessment report.51 We choose one of these pathways, known as SSP2 or the “Middle of the Road–Intermediate Challenges” scenario, because it makes no assumptions about radical changes in the probability of conflict. In SSP2, “social, economic, and technological trends do not shift markedly from historical patterns.”52 We do this because we want changes in the probability of conflict to be the output of our model, not an input. Note that we choose to focus on SSP2, but the same approach could easily be used to examine other SSP assumptions.

Different SSP scenarios are assumptions about how societies will behave. They are complemented by another set of assumptions known as Relative Concentration Pathways (RCPs). RCPs measure (in watts per square meter, W/m²) the amount of additional energy the Earth will absorb rather than return to space due to the greenhouse effect. This in turn causes the outcomes associated with climate change—temperature changes, sea-level rise, and changes in the frequency and severity of extreme weather events. There are four RCPs that make different assumptions about the amount of additional energy the Earth will absorb: 2.6 W/m², 4.5 W/m², 6.0 W/m², and 8.5 W/m².

**FIGURE 18**

Temperature Changes Associated with RCP4.5 and RCP8.5

Mean RCP4.5 temperature 2021–2040 minus 1986–2005 January–December AR5 CMIP5 subset

Mean RCP8.5 temperature 2021–2040 minus 1986–2005 January–December AR5 CMIP5 subset


NOTE: AR5 = 5th Assessment Report; CMIP5 = Coupled Model Intercomparison Project Phase 5.
RCP2.6 is associated with the least increase in global temperatures and other elements of climate change, while RCP4.5, RCP6.0, and RCP8.5 are associated with increasingly large changes in global temperatures and other elements of climate change. As shown in Figure 18, the impacts associated with any RCP vary across the globe, foreshadowing and underpinning this example’s varying impact on power across countries.

The economic, demographic, and climatic impacts associated with different SSP and RCP assumptions involve large and complex modeling efforts. Our SSP2 Climate Change example is comparatively simplistic: We make two specific changes to our baseline scenario. First, we replace our baseline forecasts of countries’ populations ages 15 to 64 with SSP2’s population assumptions. Second, we replicate the methodology of Burke, Hsiang, and Miguel (2015) to map the temperature changes associated with all four RCPs and the population assumptions associated with SSP2 to changes in countries’ GDP growth rates. In this way, our SSP2 Climate Change example involves changes to both population and GDP for all countries.

Figure 19 shows the GPI under the SSP2 Climate Change example and RCP8.5. Relative to baseline, China in this example sees significant gains in GPI, the United States and India see moderate declines, and Russia sees a slight gain.

Figures 20 and 21 show clearly why this is the case. Under SSP2 and RCP8.5, global GDP continues to increase but by significantly less than in the baseline scenario. Figure 20 shows the GDP of India and Russia as examples. India takes the largest hit relative to baseline, with its GDP in 2040 being more than $10 trillion lower than it would have been under baseline scenario assumptions. Russia is largely unaffected, and therefore gains power relative to India. Figure 21 shows the growth in GDP from 2017 to 2040 for all eight countries. China, Russia, and Germany see increases in GDP under less drastic RCP assumptions, and Japan is largely unaffected. India, the United Kingdom, the United States, and France miss out on a large amount of GDP growth relative to baseline. Another element we notice from Figure 20 is that, for many countries, the difference in GDP growth is driven largely by switching from baseline assumptions to growth rates based on SSP2 assumptions and the Burke, Hsiang, and Miguel
(2015) model, with variation among the different RCPs being relatively minor. This helps illustrate the flexibility of this approach, showing how the methodology can easily incorporate a wide variety of assumptions.

Despite the shifts in outcomes, we again see no new critical points arise under any RCP assumptions as the future GPI forecasts of major powers remain smooth. Under the most extreme RCP8.5 assumption, we do see minor changes in the timing of earlier critical points, which shifts the end date of preexisting critical point windows (Figure 22). Because critical points are calculated by identifying where a smoothed measure of GPI experiences a minimum, maximum, or inflection point, a change in the future trajectory of a country’s GPI can sometimes shift the location of critical points in recent years.

Insights

In this work, we present a methodology for quantitatively comparing the risk of major-power conflict across a variety of future scenarios. We used three illustrative examples to show the potential of this methodology: Chinese Lost Decade, Rapid Global
power among the largest states. Such shocks might still affect the risk of conflict for reasons unrelated to the balance of power.

This Methodology Enables Comparison of Different Assumptions

One of the major benefits of this methodology is its versatility. If a researcher finds the assumptions behind a particular GPI forecast unpalatable or prefers an alternative measure of national power, the implications of those alternative assumptions can be evaluated as long as they can be described quantitatively. Thus, this methodology provides flexibility on two levels. First, it provides a quantitative method for assessing the risk of future conflict between global powers under alternative scenarios. Second, the methodology provides a framework for systematically comparing the implications of different assumptions in determining the global balance of power and the associated risk of conflict. An important limitation is that the framework does not assess risks of great-power conflict that are unrelated to the balance of power.

The Believability of the Outputs Depends on the Believability of the Inputs

In highlighting this framework’s capability to flexibly incorporate any assumptions, it is important to remember that the believability of the risk assessment output by the model depends on the believability of the assumptions that are inputs. Because the model is agnostic to the believability of the input assumptions, it provides a common ground for comparing alternative assumptions. That does not mean that all possible scenarios are equally likely, and the model user will need to assess separately the likelihood of the scenario inputs. As noted in our first insight, our illustrative exercises remind users that the risk of global conflict is not likely to radically change overnight.

Insights This Approach Could Provide

A Tool to Help Avoid World War III

There are many reasons that great powers might end up engaged in war. No theory can predict with
certainty when conflict between great powers will and will not happen. Instead, theories such as power cycle theory identify conditions that correspond with increased risk of global power conflict. The methodology presented in this report illustrates a quantitative and flexible approach to assessing the future risk of great-power conflict in hundreds or thousands of potential future scenarios.

Although the baseline and three examples we examined do not describe conditions that are ripe for a conflict between major powers, we emphasize that these examples were picked for illustrative purposes and do not represent a systematic assessment of potential future scenarios. Alternative scenarios might produce greater risk, and this methodology does not capture risks unrelated to global power. Further, this methodology provides neither a probabilistic forecast nor a diagnosis of the problem. Rather, the approach is akin to the “check engine” light on a car’s dashboard: If it indicates an increased risk of a major war, then policymakers and analysts should pause and examine why before continuing to drive forward.

A Tool That Can Help Decisionmakers Identify and Avoid Emerging Threats

Another benefit of this model is that it enables us to think about the importance of changes in the future. While power can be “sticky,” when it does shift, that shift can create serious consequences. Therefore, there is value in aids that help distinguish between day-to-day crises and the rare but important shifts in the global balance of power. Future researchers could use this model to examine a variety of different scenarios and see which ones create conditions of heightened risk. Armed with that knowledge, decisionmakers can then work to avoid those paths of heightened risk or put extra precautions in place should they occur. The Chinese Lost Decade example reminds decisionmakers that if such an economic decline occurs in China, it could elevate tensions between the United States and China, creating major risks for both. Decisionmakers, armed with strategic context, could then seek to avoid provoking such a conflict or proceed with additional caution should a similar scenario occur. Though this framework is illustrated with a small set of illustrative examples, the approach is designed to be fully quantified so that it could be used to generate, assess, and compare thousands of alternative scenarios.

Appendix: Mathematical Details of Calculating Critical Points

In line with other power cycle analyses, this analysis used the following asymmetric logistic growth function to model each state’s power cycle.*

\[ P(t) = d + \frac{k}{1 + \exp[F(t)]]} \]

The term \( P \) represents a country’s relative power at time \( t \). The terms \( d \) and \( k \) are related to the minimum and maximum scores for the state’s relative power during the time frame. These values can be derived by inspecting the time series of a state’s relative power, as measured by the GPI.† \( F(t) \) is a polynomial:

\[ F(t) = b_1 + b_2 * t + b_3 * t^2 + b_4 * t^3. \]

For each country, the coefficients \( b1 \) through \( b4 \) are estimated using a least squares regression, which leads to a function that estimates a state’s relative power at time \( t \). To calculate the upper and lower turning points of the state’s power cycle, we set the first derivative equal to zero \((P'(t) = 0)\) and solve for \( t \). To calculate the first and second inflection points, we set the second derivative equal to zero \((P''(t) = 0)\) and solve for \( t \). This process generated the critical points summarized in the report for the various examples.

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† The maximum value, or upper asymptote, is equal to \((k + d)\), and the minimum value, or lower asymptote, is equal to \(d\).

9  Graham Allison’s work has catalyzed public discussion of the risk that the United States and China could fall into conflict; see Allison, 2017. For an academic survey of the lessons of history and the risk of a war between the United States and China, including two critiques of Allison’s “Thucydides Trap” argument, see Richard N. Rosecrance and Steven E. Miller, eds., The Next Great War? The Roots of World War I and the Risk of U.S.–China Conflict, Cambridge, Mass.: MIT Press, 2015.

10  Another form of influence is economic influence, such as the infrastructure investments China is pursuing through its Belt and Road Initiative.

11  For example, in its annual Military Balance report, the International Institute of Strategic Studies (IISS) generally uses exchange rates to measure the military budgets of most countries, but it uses PPP conversion rates for Russia and China owing to caveats concerning the reliability of official economic statistics and to China being a transitional economy “whose productive capabilities are similar to those of developed economies, but where cost and price structure are often much lower than world levels.” However, IISS goes on to caution that “No specific PPP rate exists for the military sector, and its use for this purpose should be treated with caution. Furthermore, there is no definitive guide as to which elements of military spending should be calculated using the limited PPP rates available.” IISS, Military Balance, Vol. 118, No. 1, 2018, p. 511.

12  For example, China continues to use Russian-built engines for its J-20 advanced fighter because China’s indigenously produced engine for the J-20 remains behind schedule. See Guy Norris, “Key Milestones Loom for New Civil and Military Engines,” Aviation Week and Space Technology, December 22, 2017, p. 84; and Andrew Tate, “Aerial Refuelling Capability of China’s J-20 Fighter Confirmed,” Jane’s Defence Weekly, November 19, 2018.


14  Economists have raised concerns that China has significantly overstated its GDP for at least 20 years; see, for example, Thomas Rawski, “What Is Happening to China’s GDP Statistics?” China Economic Review, Vol. 12, No. 4, 2001, pp. 347–354; and Alice Siqi Han, “China’s Economic Black Box,” Foreign Policy, March 17, 2019. Some economists have even argued that there is a fundamental divergence between China’s reported GDP and the country’s underlying economy; see Michael Pettis, “What Is GDP in China?” China Financial Markets, blog, Carnegie Endowment for International Peace, January 16, 2019.


20 Human capital considerations include such things as the training and motivation of military personnel, as well as the effectiveness of military organizations. It is hard to quantify the effectiveness of these sorts of factors, which may lead to their importance being underestimated. See Lanyi and Brickell, 1999.

21 See NIC Global Trends reports (National Intelligence Council, “Global Trends,” webpage, Office of the Director of National Intelligence, undated). There have been industrial-age measures of power, and there is a broad literature on how to update them for the 21st century. For an example, see Tellis et al., 2000.

22 For more on how the IF model uses the GPI and for an example forecast using it, see Jonathan Moyer and Alanna Markle, Relative National Power Codebook, Denver, Colo.: Frederick S. Pardee Center for International Futures, Josef Korbel School of International Studies, University of Denver, 2017.

23 The choice of denominator—here the total power of all G20 countries—makes no mechanical difference, because what matters is the power of the countries displayed relative to each other. The eight countries we examine have a smaller share of total global power than total G20 power, but their power relative to each other is unchanged—the United States would still have twice the global power of China in 2007. In other words, the choice of denominator may double or halve the y-axis measure of power, but the shape and relation of the power curves, and the resulting implications of the power cycle theory we use to assess risk, are identical regardless of whether the denominator is all countries, the G20, or just the power of the eight countries included in our examples.

24 For example, the full GPI uses working-age population adjusted by years of schooling, while our modified GPI uses total working-age population, so China’s lower rate of education in its workforce reduces the relative contribution of its population to the full GPI.

25 In other words, this is the smallest margin of advantage that the majority of the U.S. population has ever experienced (because about half of the U.S. population was 37 years old or younger in 2017). “Annual Estimates of the Resident Population by Single Year of Age and Sex for the United States: April 1, 2010 to July 1, 2017,” U.S. Census Bureau, Population Division, American FactFinder database, release date: June 2018.


27 There are several different taxonomies that one can use to organize the various theories of why wars occur. A classic framework developed by Kenneth Waltz divided theories into three broad types, according to the independent variable the theory uses to explain why wars occur. “First image” theories focus on human nature as the fundamental cause of conflict, “second image” theories focus on the nature of regimes, and “third image” theories focus on the nature of the international system (Kenneth Waltz, Man, the State, and War, New York: Columbia University Press, 1959). An extensive RAND study synthesized a variety of international relations theories to develop a statistical model of both interstate and intrastate wars (Stephen Watts, Bryan Frederick, Jennifer Kavanagh, Angela O’Mahony, Thomas S. Szayna, Matthew Lane, Alexander Stephenson, and Colin P. Clark, A More Peaceful World? Regional Conflict Trends and U.S. Defense Planning, Santa Monica, Calif.: RAND Corporation, RR-1177-A, 2017).


32 Lee Kuan Yew assessed that “the Chinese have figured out that if they stay with ‘peaceful rise’ and just contest for first position economically and technologically, they cannot lose” (Graham Allison and Robert D. Blackwill, “Will China Ever Be No. 1?” YaleGlobal Online newsletter, February 20, 2013).

33 For example, “. . . we’ve been told for a long, long time that Deng Xiaoping’s action was this: ‘Hide your strength, bide your time, never take the lead.’ Xi Jinping in his last five years turned that on its head, now we see consciously and deliberately a more overtly activist Chinese foreign policy and security policy and
international economic policy in the world at large” (Tobin Harshaw, “Emperor Xi’s China Is Done Biding Its Time: A Q&A with Former Australian Prime Minister Kevin Rudd, Who Is Going to School to Study the Chinese President,” Bloomberg News, March 3, 2018).

One scholar likens China attempting to maintain a low profile in 2018 to an elephant trying to hide behind a small tree (Ruan Zongze, “Chinese Scholar Ruan Zongze Comments on Whether China Has Stopped ‘Hide and Bide’ Strategy,” Huanqiu Shibao Online in Chinese, May 11, 2018).


China’s claims to the South China Sea date to the founding of the country, and it fought skirmishes over the decades to defend and expand its influence there. China’s island-building campaign, however, has dwarfed the scale and speed of those of other countries. In less than two years, it created approximately 3,000 acres of artificial islands in the South China Sea, two orders of magnitude more area than any other claimant. Vietnam, for example, has reclaimed only 80 acres. Matthew Southelder, China’s Island Building in the South China Sea: Damage to the Marine Environment, Implications, and International Law, Washington, D.C.: U.S.-China Economic and Security Review Commission Staff Report, April 12, 2016.


For example, recent RAND research explored this lens; see Watts et al., 2017.

One could further adjust the balance of power analysis to include the aggregated power of alliances rather than individual countries, which could shift when a power transition occurs. See, again, Watts et al., 2017.

For example, the robust decision making methodology examines a wide range of plausible futures to help create adaptive and robust strategies. An early overview can be found in Robert J. Lempert, Steven W. Popper, and Steven C. Bankes, Shaping the Next One Hundred Years: New Methods for Quantitative, Long-
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**Acknowledgments**

The authors would like to thank Cedric Kenney, Sonni Efron, Andrew Parasiliti, Robin Meili, Alan Vick, Rob Lempert, Mike Spirtas, and King Mallory for their assistance, support, and insights throughout the development of this report. The authors also thank Timothy J. Smith, Bryan Frederick, and Greg Treverton for reviews that improved the quality of this work.
About This Report

There is growing concern that U.S. power has been declining relative to the growing power of Russia and China. This concern renews long-standing questions about how we should measure national power, which nations have the most power, which states are gaining and losing power, and when such shifts in relative or perceived power might portend conflict. In this report, the authors explore these questions, proposing a new tool for measuring the interstate balance of power and identifying periods during which shifts in the balance of power could potentially portend conflict. The research was conducted within the RAND Center for Global Risk and Security.

Funding

Funding for this report was provided by gifts from RAND supporters and income from operations.

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There is growing concern that U.S. power has been declining relative to the growing power of Russia and China. This concern renews longstanding questions about how we should measure national power, which nations have the most power, which states are gaining and losing power, and when such shifts in relative or perceived power might portend conflict. The authors explore these questions, illustrating a quantitative, scenario-based approach for policymakers who are interested in measuring the interstate balance of power, assessing the impact of shocks on the balance of power, and identifying periods during which shifts in the balance of power could potentially portend conflict between major powers. The methodology defines how different climate change scenarios, population projections, or economic growth forecasts lead to different balances of global power, then uses power cycle theory to map those changes in the distribution of global power to changes in the risk of conflict between major global powers. The authors demonstrate the potential of this methodology using three illustrative examples. They find that global power can be “sticky,” meaning it takes drastic assumptions about the future to create meaningful changes in the global balance of power. Further, because their model treats global power as a relative concept, the authors find that the types of shocks that affect the risk of conflict are the types that create relative “winners” and “losers.”