China's Century?

Why America's Edge Will Endure

Michael Beckley

According to the Global Language Monitor, which tracks the top 50,000 media sources throughout the world, the "rise of China" has been the most read-about news story of the twenty-first century, surpassing the September 11 terrorist attacks, the Iraq War, the election of Barack Obama, and the British royal wedding.[1] One reason for the story's popularity, presumably, is that the rise of China entails the decline of the United States. While China's economy grows at 9 percent annually, the United States reels from economic recession, costly wars in Iraq and Afghanistan, and massive budget deficits. This divergence in fortunes has produced two pieces of conventional wisdom in U.S. and Chinese foreign policy debates.[2] First, the United States is in decline relative to China. Second,

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1. "Top News Stories of the 21st Century," Global News Monitor, http://www.languagemonitor.com/top-news/bin-ladens-death-one-of-top-news-stories-of-21th-century/.

2. Many studies make these arguments. See, for example, Arvind Subramanian, "The Inevitable Superpower: Why China's Rise Is a Sure Thing," *Foreign Affairs,* Vol. 90, No. 5 (September/October 2011), pp. 66–78; Gideon Rachman, "American Decline: This Time It's for Real," *Foreign Policy,* No. 184 (January/February 2011), pp. 59–65; Wu Xinbo, "Understanding the Geopolitical Implications of the Global Financial Crisis," *Washington Quarterly,* Vol. 33, No. 4 (October 2010), pp. 155–163; Christopher Layne, "The Waning of U.S. Hegemony—Myth or Reality? A Review Essay," *International Security,* Vol. 34, No. 1 (Summer 2009), pp. 147–172; Robert A. Pape, "Empire Falls," *National Interest,* No. 99 (January/February 2009), pp. 21–34; Martin Jacques, *When China Rules the World: The Rise of the Middle Kingdom and the End of the Western World* (New York: Penguin, 2009); National Intelligence Council (NIC), *Global Trends 2025: A Transformed World* (Washington, D.C.: NIC, 2008); Cui Liru "Quanqiu shidai yu duoji shijie" [A multipolar world in the era of globalization], *Xiandai Guoji Guanxi,* No. 1 (2010), pp. 1–4; and Chen Yugang, "Jinrong weiji, Meiguo shuailuo yu guoji guanxi geju bianpinghua" [The financial crisis, American decline, and the flattening of the international structure], *Shijie Jingji yu Zhengzhi,* No. 5 (2009), pp. 28–34. For the alternative, but less prevalent perspective that the United States is not in decline, see, for example, Joseph S. Nye Jr., *The Future of Power* (New York: Perseus, 2011), chap. 6; Daniel W. Drezner, "China Isn't Beating the U.S.," *Foreign Policy,* No. 184 (January/February 2011), p. 67; Eric S. Edelman, *Understanding America's Contested Primacy* (Washington, D.C.: Center for Strategic and Budgetary Assessments, 2010), chap. 3; Josef Joffe, "The Default Power: The False Prophecy of America's Decline," *Foreign Affairs,* Vol. 88, No. 5 (September/October 2009), pp. 21–35; Edward Luttwak, "The Declinists, Wrong Again," *American Interest,* Vol. 4, No. 2 (November/December 2008), pp. 7–13; Song Wei, "Guoji jinrong weiji yu Meiguo de danji diwei" [The global financial crisis and America's unipolar status], *Shijie Jingji yu Zhengzhi,* No. 5 (2010), pp. 25–48; and Xu Jin, "Jinrong weiji nanyi dianfu yi chao duo qiang geju," [The financial crisis will not likely overturn the one superpower, many strong powers structure], *Shijie Jingji yu Zhengzhi Zhengzhi,* No. 12 (2008), pp. 26–27.

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much of this decline is the result of globalization—the integration of national economies and resultant diffusion of technology from developed to developing countries—and the hegemonic burdens the United States bears to sustain globalization.

An alternative, though less prevalent, perspective rejects both of these assumptions.[3] In this view, U.S. power is durable, and globalization and America's hegemonic role are the main reasons why. The United States derives competitive advantages from its preponderant position, and globalization allows it to exploit these advantages, attracting economic activity and manipulating the international system to its benefit.

Resolving the debate between these two perspectives is imperative for prudent policymaking. If proponents of the dominant, or "declinist," perspective are correct, then the United States should contain China's growth by "[adopting] a neomercantilist international economic policy" and subdue China's ambitions by "disengag[ing] from current alliance commitments in East Asia."[4] If, however, the United States is not in decline, and if globalization and hegemony are the main reasons why, then the United States should do the opposite: it should contain China's growth by maintaining a liberal international economic policy, and it should subdue China's ambitions by sustaining a robust political and military presence in Asia.

With few exceptions, however, existing studies on the decline of the United States and the rise of China suffer from at least one of the following shortcomings.[5] First, most studies do not look at a comprehensive set of indicators. Instead they paint impressionistic pictures of the balance of power, presenting tidbits of information on a handful of metrics. In general, this approach biases

3. Salvatore Babones, "The Middling Kingdom: The Hype and Reality of China's Rise," *Foreign Affairs,* Vol. 90, No. 5 (September/October 2011), pp. 79–88; Nye, *The Future of Power,* chap. 6; Drezner, "China Isn't Beating the U.S.," p. 67; Edelman, *Understanding America's Contested Primacy,* chap. 3; Joffe, "The Default Power"; Stephen G. Brooks and William C. Wohlforth, *World Out of Balance: International Relations and the Challenge of American Primary* (Princeton, N.J.: Princeton University Press, 2008); Edward Luttwak, "The Declinists, Wrong Again," pp. 7–13; Song Wei, "Guoji jinrong weiji yu Meiguo de danji diwei," pp. 25–48; and Xu Jin, "Jinrong weiji nanyi dianfu yi chao duo qiang geju," pp. 26–27.

4. Christopher Layne "From Preponderance to Offshore Balancing: America's Future Grand Strategy," *International Security,* Vol. 22, No. 1 (Summer 1997), pp. 87, 118. See also Paul K. MacDonald and Joseph M. Parent, "Graceful Decline? The Surprising Success of Great Power Retrenchment," *International Security,* Vol. 35, No. 4 (Spring 2011), pp. 7–44; and Barry Posen, "The Case for Restraint," *American Interest,* Vol. 3, No. 2 (November/December 2007), pp. 7–32.

5. Partial exceptions include Sheena Chestnut and Alastair Iain Johnston, "Is China Rising?" in Eva Paus, Penelope B. Prime, and Jon Western, eds., *Global Giant: Is China Changing the Rules of the Game?* (New York: Palgrave, 2009), chap. 12; and Titus Galama and James Hosek, *U.S. Competitiveness in Science and Technology* (Santa Monica, Calif.: RAND, 2008).

results in favor of the declinist perspective because most standard indicators of national power—for example, gross domestic product (GDP), population, and energy consumption—conflate size with power and thereby overstate the capabilities of large but underdeveloped countries. For example, in a recent study Arvind Subramanian contends that "China's dominance is a sure thing" based on "an index of dominance combining just three factors: a country's GDP, its trade (measured as the sum of its exports and imports of goods), and the extent to which it is a net creditor to the world."[6] The United States and China, however, are each declining by some measures while rising in terms of others. To distinguish between ascendance and decline writ large, therefore, requires analyzing many indicators and determining how much each one matters in relation to others.

Second, many studies are static, presenting single-year snapshots of U.S. and Chinese power. This flaw tends to bias results in favor of the alternative perspective because the United States retains a significant lead in most categories. The key question, however, is not whether the United States is more powerful than China at present, but whether it will remain so in the future. Without a dynamic analysis, it is impossible to answer this question.

This study addresses these shortcomings by comparing the United States and China across a large set of economic, technological, and military indicators over the past twenty years. The results are mixed, but the bulk of the evidence supports the alternative perspective. Over the last two decades, globalization and U.S. hegemonic burdens have expanded significantly, yet the United States has not declined; in fact it is now wealthier, more innovative, and more militarily powerful compared to China than it was in 1991.

China has narrowed the gap in terms of GDP and now exports a greater volume of high-technology products and employs more scientists than any country in the world. However, GDP correlates poorly with national power; more than 90 percent of China's high-tech exports are produced by foreign firms and consist of low-tech components; and China's quantitative advantage in scientists has not yet translated into qualitative advantages in innovation. The United States suffers from a huge debt problem that its political system appears ill-suited to solve. China, however, faces its own fiscal mess, which may be more intractable than America's.

The widespread misperception that China is catching up to the United States stems from a number of analytical flaws, the most common of which is

6. Subramanian, "The Inevitable Superpower," p. 67.

the tendency to draw conclusions about the U.S.-China power balance from data that compare China only to its former self. For example, many studies note that the growth rates of China's per capita income, value added in high-technology industries, and military spending exceed those of the United States and then conclude that China is catching up. This focus on growth rates, however, obscures China's decline relative to the United States in all of these categories. China's growth rates are high because its starting point was low. China is rising, but it is not catching up.[7]

This article proceeds in three sections. First, I discuss the theoretical foundations of the declinist and alternative perspectives. Second, I test these two perspectives empirically. Finally, I discuss the dangers of the false belief in American decline.

The Decline Debate

At its core, the debate about U.S. decline is a debate about the relevance of history. Declinists contend that history tends to repeat itself and that the history of world politics can be characterized as a "succession of hegemonies,"[8] as the recurrent "rise and fall of the great powers,"[9] as an "observable pattern of great power emergence,"[10] or as a series of "long cycles."[11] The Habsburg, French, and British Empires were defeated and surpassed by rising challengers. It is therefore natural for America's "unipolar moment" to be similarly consigned to the ash-heap of history.[12]

Several established academic theories underpin this cyclical view of history. First, declinists fuse hegemonic stability theory with traditional balance of power theory.[13] In this view, the United States, like Great Britain in the nineteenth century, supplies the world with public goods. Weaker states not only

7. On the distinction between "rising" and "catching up," see Chestnut and Johnston, "Is China Rising?"
8. Robert Gilpin, *War and Change in World Politics* (Cambridge: Cambridge University Press, 1981).
9. Paul Kennedy, *The Rise and Fall of the Great Powers: Economic Change and Military Conflict from 1500–2000* (New York: Vintage, 1987).
10. Christopher Layne, "The Unipolar Illusion: Why New Great Powers Will Rise," *International Security,* Vol. 17, No. 4 (Spring 1993), p. 9.
11. George Modelski, "The Long Cycle of Global Politics and the Nation-State," *Comparative Studies in Society and History,* No. 20 (April 1978), pp. 214–235.
12. Charles Krauthammer, "The Unipolar Moment," *Foreign Affairs,* Vol. 70, No. 1 (Winter 1990/91), pp. 23–33.
13. On hegemonic stability theory, see Charles P. Kindleberger, *The World in Depression, 1929–1939* (Berkeley: University of California Press, 1973); and Robert O. Keohane, "The Theory of Hegemonic Stability and Changes in International Economic Regimes, 1967–1977," in Ole R. Holsti, Randolph M. Siverson, and Alexander L. George, eds., *Change in the International System* (Boulder,

free-ride on these services, but also engage in sabotage, erecting diplomatic and economic obstacles to U.S. initiatives and forming anti-American alliances.[14] As a result, others rise while the United States suffers from "imperial overstretch."[15]

Second is the theory of convergence and its claim that, in an open global economy, poor countries tend to grow faster than rich countries.[16] China, like Germany, Japan, and South Korea before it, can reap the "advantages of backwardness," adopting modern technologies and methods while skipping the long, arduous process of inventing them.[17] Meanwhile U.S. investment in foreign countries "tends to abort the reinvigoration of the American domestic economy and its technical infrastructure."[18] Globalization thus stimulates growth abroad while undercutting it at home, diffusing not just technology but also technological and military capabilities.

By contrast, the basic argument of the alternative perspective is that the laws of history do not apply to contemporary world politics. The United States is not like Britain; rather, its "combination of quantitative and qualitative material advantages is unprecedented, and it translates into a unique geopolitical position."[19] Moreover, China is not like past rising challengers; "its emergence is occurring in the context of a transformation in the manner in which production is organized, a shift that makes China's rise categorically different from that of predecessors such as Germany, Japan, and South Korea."[20] In sum, the declinist perspective emphasizes how U.S. hegemony and the current global economy resemble those of past eras, whereas the alternative perspective em-

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Colo.: Westview, 1980), pp. 131–162. On balance of power theory, see Kenneth N. Waltz, *Theory of International Politics* (New York: Random House, 1979).

14. Layne, "The Unipolar Illusion"; Kenneth N. Waltz, "The Emerging Structure of International Politics," *International Security,* Vol. 18, No. 2 (Fall 1994), pp. 44–79; and Robert A. Pape, "Soft Balancing against the United States," *International Security,* Vol. 30, No. 1 (Summer 2005), pp. 7–45.

15. Kennedy, *The Rise and Fall of the Great Powers,* p. 515.

16. William J. Baumol, "Productivity Growth, Convergence, and Welfare: What the Long-Run Data Show," *American Economic Review,* Vol. 76 (December 1986), pp. 1072–1085; Harvey Leibenstein, *General X-Efficiency Theory and Economic Development* (New York: Oxford University Press, 1978), pp. 98–112; and Walt W. Rostow, *Why the Poor Get Richer and the Rich Slow Down* (Austin: University of Texas Press, 1980), pp. 259–301. On the argument that open economies converge, see Jeffrey Sachs, Andrew Warner, Anders Aslund, and Stanley Fisher, "Economic Reform and the Process of Global Integration," *Brookings Papers on Economic Activity,* Vol. 1 (1995).

17. Alexander Gerschenkron, *Economic Backwardness in Historical Perspective* (Cambridge, Mass.: Harvard University Press, 1962), chap. 1.

18. Robert Gilpin, *U.S. Power and the Multinational Corporation: The Political Economy of Foreign Direct Investment* (New York: Basic Books, 1975), p. 204.

19. William C. Wohlforth, "The Stability of a Unipolar World," *International Security,* Vol. 24, No. 1 (Summer 1999), p. 17.

20. Edward S. Steinfeld, "China's Shallow Integration: Networked Production and the New Challenges for Late Industrialization," *World Development,* Vol. 32, No. 11 (April 2004), p. 1971.

phasizes how they are unique. I elaborate these two focal points of debate below.

HEGEMONY: COSTLY OR PROFITABLE?

According to declinists, the United States is suffering from a classic case of the "hegemon's dilemma."[21] To maximize its absolute economic gains, the United States must provide and police a regime of free commerce regardless of what other countries do. This policy, however, "insures that it will experience a relative economic decline and in time, therefore, a decline in its hegemonic position."[22] In this view, the United States is either benevolent or impotent, unwilling or unable to force others to help maintain the international order.[23] Declinists do not agree on why the hegemon sacrifices its resources and energy to support the system—for some, the hegemon acts out of self-interest;[24] for others, the hegemon is motivated by "conscience, duty, obligation, or such old-fashioned notions as noblesse oblige"[25]—but they do agree that the public goods the United States provides "are not productive investments, they constitute an economic drain on the economy of the dominant state."[26]

The hegemon's dilemma is most pronounced in three areas: security, finance, and trade. First, in the security realm, the very extent of the hegemon's influence multiplies and magnifies threats to its core interests and, as a result, the resources the hegemon must expend to defend them.[27] Ancient Rome, for example, sought security through territorial expansion, but this strategy simply created more distant frontiers to defend. U.S. hegemony may depend less on direct territorial control, but the basic pattern of greater power begetting greater military burdens still seems to apply—the United States now formally guarantees the security of more than fifty countries, has fought twice as many wars after the Cold War as during it, and spends 25 percent more (in real

21. Arthur Stein, "The Hegemon's Dilemma: Great Britain, the United States, and the International Economic Order," *International Organization,* Vol. 38, No. 2 (Spring 1984), p. 384.
22. Ibid.
23. On hegemonic feebleness, see David Lake, "Leadership, Hegemony, and the International Economy: Naked Emperor or Tattered Monarch with Potential?" *International Studies Quarterly,* Vol. 37, No. 4 (December 1993), pp. 467–468.
24. Duncan Snidal, "The Limits of Hegemonic Stability," *International Organization,* Vol. 39, No. 4 (Autumn 1985), p. 589; and Gilpin, *War and Change in World Politics,* pp. 138–139.
25. Charles P. Kindleberger, "Hierarchy versus Inertial Cooperation," *International Organization,* Vol. 40, No. 4 (Autumn 1986), p. 845.
26. Gilpin, *War and Change in World Politics,* pp. 156–157.
27. Robert Jervis, "The Remaking of a Unipolar World," *Washington Quarterly,* Vol. 29, No. 3 (Summer 2006), pp. 7–19; Kennedy, *The Rise and Fall of the Great Powers,* pp. 488–540; Gilpin, *War and Change in World Politics,* chap. 4; and Layne, "From Preponderance to Offshore Balancing."

dollars) on defense today than it did in 1968 at the height of combat in Vietnam.[28]

Second, because the United States allows the dollar to function as a global reserve and exchange unit, it must run persistent balance-of-payments deficits to supply the world with liquidity. Doing so, however, undermines not only the competitiveness of U.S. exports but also the confidence of markets and central banks in the dollar, thereby increasing the risk of a dollar collapse.[29] Even if foreigners hold on to their dollar-denominated assets, the United States' rising deficits trigger higher interest rates and, as a consequence, slower rates of economic growth.[30] In addition, foreign creditors can wield their dollars as weapons, manipulating U.S. policy by threatening to sell their reserves.[31] China's holdings, at $1.5 trillion and climbing, loom especially large in this respect.[32]

Third, because its economy accounts for a large portion of the world economy, the United States must maintain an open market, even in the face of foreign protectionism, to prevent the collapse of the global free trade regime.[33] As Arthur Stein writes, "Hegemons do not impose openness, they bear its

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28. On U.S. alliances, see Douglas M. Gibler, *International Military Alliances from 1648 to 2008* (Washington, D.C.: Congressional Quarterly Press, 2010); Mancur Olson Jr. and Richard Zeckhauser, "An Economic Theory of Alliances," *Review of Economics and Statistics,* Vol. 48, No. 3 (August 1966), pp. 266–279; and David Gompert and Richard Kugler, "Free-Rider Redux," *Foreign Affairs,* Vol. 74, No. 1 (January/February 1995), pp. 7–12. On recent American war-proneness, see Nuno Monteiro, "Three Essays on Unipolarity," Ph.D. dissertation, University of Chicago, 2009, chap. 1. On U.S. defense spending, see Richard K. Betts, "A Disciplined Defense," *Foreign Affairs,* Vol. 86, No. 6 (November/December 2007), pp. 67–80.

29. Robert Triffin, *Gold and the Dollar Crisis: The Future of Convertibility* (New Haven, Conn.: Yale University Press, 1960); Francis E. Warnock, *How Dangerous Is U.S. Government Debt?* (New York: Council on Foreign Relations Press, 2010); Maurice Obstfeld and Kenneth Rogoff, "The Unsustainable U.S. Current Account Position Revisited," *Proceedings,* Federal Reserve Bank of San Francisco (2005); and NIC, *Global Trends 2025,* pp. 7–14.

30. Carmen M. Reinhart and Kenneth S. Rogoff, "Growth in a Time of Debt," *American Economic Review,* Vol. 100, No. 2 (May 2010), pp. 573–578; and Roger C. Altman and Richard N. Haass, "American Profligacy and American Power," *Foreign Affairs,* Vol. 89, No. 6 (November/December 2010), pp. 25–34.

31. Albert O. Hirschman, *National Power and the Structure of Foreign Trade* (Berkeley: University of California Press, 1945), chaps. 1–2; Robert Gilpin, *The Political Economy of International Relations* (Princeton, N.J.: Princeton University Press, 1987), pp. 323–340; and Brad Sester, *Sovereign Wealth and Sovereign Power: The Strategic Consequences of American Indebtedness* (New York: Council on Foreign Relations Press, 2008).

32. Subramanian, "Inevitable Superpower"; and Brad Sester and Arpana Pandey, "China's $1.5 Trillion Bet: Understanding China's External Portfolio," Working Paper (New York: Center for Geoeconomic Studies, Council on Foreign Relations, May 2009).

33. Charles P. Kindelberger, "Dominance and Leadership in the International Economy: Exploitation, Public Goods, and Free Riders," *International Studies Quarterly,* Vol. 25, No. 2 (June 1981), pp. 242–254; Keohane, "The Theory of Hegemonic Stability"; and Giplin, *U.S. Power and the Multinational Corporation,* p. 48.

costs."[34] Declinists tout Britain's unilateral repeal of the Corn Laws in 1849 and the United States' tolerance of Japanese, Korean, and European trade barriers during the Cold War as prime examples of such "asymmetrical trade agreements."[35]

Hegemony is indeed expensive and provocative, but these declinist arguments tell only part of the story. The United States is both "system-maker and privilege-taker"—it pays a large share of system-maintenance costs but takes a disproportionate share of the benefits.[36] The basic claim of the alternative perspective is that these benefits outweigh the costs.

Most obvious, the United States, as hegemon, possesses an array of tools with which to reward and punish. It can provide, restrict, or deny access to the U.S. market, technology, foreign aid, support for membership in international organizations, bribes, and White House visits. These tit-for-tat bargains with individual states, however, are not as consequential as the United States' power over aspects of the international system itself. In the alternative perspective, hegemony is not just preponderant power, it is "structural power."[37] It is the power to set agendas, to shape the normative frameworks within which states relate to one another, and to change the range of choices open to others without putting pressure directly on them. It is, at once, less visible and more profound than brute force.

Seen in this light, the United States is neither benevolent nor feeble, but coercive and capable, and the goods it produces "are less collective goods than private ones, accruing primarily to the hegemon and thus helping maintain its hegemony."[38] Military superiority, for example, allows the United States to employ "force without war," pressuring other countries into making concessions by shifting military units around or putting them on alert.[39] It also allows

34. Stein, "The Hegemon's Dilemma," p. 386.
35. Ibid., p. 359.
36. Michael Mastanduno, "System Maker, Privilege Taker: U.S. Power and the International Political Economy," *World Politics,* Vol. 61, No. 1 (January 2009), pp. 121–154.
37. Susan Strange, *States and Markets* (New York: St. Martin's, 1994). See also Michael Mandelbaum, *The Case for Goliath: How America Acts as the World's Government in the Twenty-First Century* (New York: PublicAffairs, 2005); Carla Norrlof, *America's Global Advantage: U.S. Hegemony and International Cooperation* (New York: Cambridge University Press, 2010); G. John Ikenberry, "American Power and the Empire of Capitalist Democracy," *Review of International Studies,* Vol. 27 (December/January 2001–02), pp. 191–212; Stephen Gill, *American Hegemony and the Trilateral Commission* (New York: Cambridge University Press, 1992), chap. 4; Nye, *The Future of Power,* chap. 1; and Bruce M. Russett, "The Mysterious Case of Vanishing Hegemony; or, Is Mark Twain Really Dead?" *International Organization,* Vol. 39, No. 2 (Spring 1985), pp. 207–231.
38. Russett, "The Mysterious Case of Vanishing Hegemony," p. 208. See also Isabelle Grunberg, "Exploring the 'Myth' of Hegemonic Stability," *International Organization,* Vol. 44, No. 4 (Autumn 1990), pp. 439–444.
39. Barry Blechman and Stephen Kaplan, *Force without War* (Washington, D.C.: Brookings Institution, 1978), chap. 4.

the United States to run a protection racket, garnering influence through the provision of security. As Joseph Nye explains, "Even if the direct use of force were banned among a group of countries, military force would still play an important political role. For example, the American military role in deterring threats to allies, or of assuring access to a crucial resource such as oil in the Persian Gulf, means that the provision of protective force can be used in bargaining situations. Sometimes the linkage may be direct; more often it is a factor not mentioned openly but present in the back of statesmen's minds."[40]

To be sure, the costs of maintaining U.S. military superiority are substantial. By historical standards, however, they are exceptionally small.[41] Past hegemons succumbed to imperial overstretch after fighting multifront wars against major powers and spending more than 10 percent (and often 100 or 200 percent) of their GDPs on defense.[42] The United States, by contrast, spends 4 percent of its GDP on defense and concentrates its enmity on rogue nations and failed states. Past bids for global mastery were strangled before hegemony could be fully consolidated. The United States, on the other hand, has the advantage of being an extant hegemon—it did not overturn an existing international order; rather, the existing order collapsed around it. As a result, its dominant position is entrenched to the point that "any effort to compete directly with the United States is futile, so no one tries."[43]

The dollar's global role may handicap American exports, but it also comes with perks including seigniorage,[44] reduced exchange rate risks for U.S. firms involved in international commerce, competitive advantages for American banks in dollarized financial markets, and the ability to delay and deflect current account adjustments onto other countries.[45] More important, foreign governments that hold dollar reserves depend on U.S. prosperity for their continued economic growth and are thus "entrapped," unable to disentangle their interests from those of the United States.[46] Rather than

40. Joseph S. Nye Jr., *Bound to Lead: The Changing Nature of American Power* (New York: Basic Books, 1991), p. 31.
41. Paul Kennedy, "The Greatest Superpower Ever," *New Perspectives Quarterly,* Vol. 19, No. 2 (Spring 2002), pp. 8–18.
42. Kennedy, *The Rise and Fall of the Great Powers.*
43. Wohlforth, "The Stability of a Unipolar World," p. 18. See also Brooks and Wohlforth, *World Out of Balance,* chap. 2.
44. Benjamin J. Cohen estimates that the United States earns $20 billion annually from seignorage. See Cohen, *Global Monetary Governance* (New York: Routledge, 2008), p. 258.
45. On the benefits of reserve currency status, see David P. Calleo "Twenty-First Century Geopolitics and the Erosion of the Dollar Order," in Eric Helleiner and Jonathan Kirshner, eds., *The Future of the Dollar* (Ithaca, N.Y.: Cornell University Press, 2009), chap. 8.
46. Jonathan Kirshner, *Currency and Coercion: The Political Economy of International Monetary Power*

seeking to undermine the American economy, they invest in its continued expansion.[47]

Finally, given its position at the top of the world trade regime, the United States can distort international markets in its favor.[48] Declinists expect the hegemon to use its power magnanimously. According to the alternative perspective, however, American foreign economic policy involves the routine use of diplomatic leverage at the highest levels to create opportunities for U.S. firms.[49] U.S. trade officials, "acting as self-appointed enforcers of the free trade regime, asserted the right with their own national law to single out and punish countries they judged to be unfair traders."[50] Globalization, therefore, may not be a neutral process that diffuses wealth evenly throughout the international system, but a political process shaped by the United States in ways that serve its interests.

Globalization: Diffusion or Polarization?

Economic growth does not appear everywhere and all at once. Instead it clusters in particular places at different times. The relative strength of two opposing tendencies determines where growth takes place. On one hand, there is what Albert Hirschman called the "polarization effect" by which wealth and power concentrate in areas that are already wealthy and powerful.[51] On the other hand, there is an opposing "diffusive effect"; the tendency for ideas and technology to trickle down from established centers to peripheral areas and, as a result, for economic activity to spread to new locations.

(Princeton, N.J.: Princeton University Press, 1995), pp. 117–119. See also Strange, *States and Markets,* chap. 5.

47. Daniel W. Drezner, "Bad Debts: Assessing China's Financial Influence in Great Power Politics," *International Security,* Vol. 34, No. 2 (Fall 2009), pp. 7–45; Joseph S. Nye Jr., "American and Chinese Power after the Financial Crisis," *Washington Quarterly,* Vol. 33, No. 4 (October 2010), pp. 146–149; Brooks and Wohlforth, *World Out of Balance,* pp. 121–129; and Norrlof, *America's Global Advantage.*

48. Jagdish Bhagwati and Hugh T. Patrick, eds., *Aggressive Unilateralism: America's 301 Trade Policy and the World Trading System* (Ann Arbor: University of Michigan Press, 1990); Nye, *Bound to Lead,* pp. 90–95; Lutao Ning, *China's Rise in the World Information and Communication Technology Industry* (New York: Routledge, 2009), chaps. 5, 8; Michael Mastanduno, "Preserving the Unipolar Moment: Realist Theories and U.S. Grand Strategy after the Cold War," *International Security,* Vol. 21, No. 4 (Spring 1997), pp. 49–88; and Brooks and Wohlforth, *World Out of Balance,* chap. 4. For an application of this argument to the defense industry, see Jonathan D. Caverley, "United States Hegemony and the New Economics of Defense," *Security Studies,* Vol. 16, No. 4 (October/December 2007), pp. 598–614; and Ethan B. Kapstein, "America's Arms-Trade Monopoly: Lagging Sales Will Starve Lesser Suppliers," *Foreign Affairs,* Vol. 73, No. 3 (May/June 1994), pp. 13–20.

49. On this point, see John Stremlau, "Clinton's Dollar Diplomacy," *Foreign Policy,* No. 97 (Winter 1994/95), pp. 18–35.

50. Michael Mastanduno, "System Maker, Privilege Taker," p. 126.

51. Albert O. Hirschman, *The Strategy of Economic Development* (New Haven, Conn.: Yale University Press, 1958), pp. 187–192.

Declinists associate globalization with diffusion. Robert Pape, for example, calculates that "just over half" of the United States' relative decline from 2000 to 2008, which he calls "one of the largest relative declines in modern history," resulted from "the spread of technology to the rest of the world."[52] Similarly, Fareed Zakaria writes, "The unipolar order of the last two decades is waning not because of Iraq but because of the broader diffusion of power across the world."[53]

Several conventionally accepted assumptions undergird this view. First, many scholars believe it is easier for developing countries to adopt existing technologies than for developed countries to invent new ones. Developing countries can therefore advance rapidly "from imitation to innovation," and perhaps even "leap-frog" up the value chain, by importing and copying foreign high-technology products.[54]

The second assumption is that economic backwardness is not a handicap, but rather a source of competitive advantage.[55] Low living standards allow developing countries to engage in "cost innovation"—the production of high-technology products at a fraction of the cost of technological leaders.[56] To remain competitive, firms from rich nations may have little choice but to outsource parts of their business to the developing world, a strategy that further increases developing countries' access to advanced technology.[57] Over time, "with lower costs and equivalent technology backward societies fre-

52. Pape, "Empire Falls," p. 26.
53. Fareed Zakaria, *The Post-American World* (New York: W.W. Norton, 2008), p. 43.
54. Linsu Kim, *Imitation to Innovation: The Dynamics of Korea's Technological Learning* (Boston: Harvard Business School, 1997), pp. 88–93, 193–194; Ronald Findlay, "Relative Backwardness, Direct Foreign Investment, and the Transfer of Technology: A Simple Dynamic Model," *Quarterly Journal of Economics,* Vol. 92, No. 1 (February 1978), pp. 1–16; Sanghamitra Das, "Externalities and Technology Transfer through Multinational Corporations," *Journal of International Economics,* Vol. 22, Nos. 1–2 (February 1987), pp. 171–182; and Richard A. Bitzinger, "The Globalization of the Arms Industry: The Next Proliferation Challenge," *International Security,* Vol. 19, No. 2 (Autumn 1994), pp. 170–198. For an application of this argument to China, see Adam Segal, "The Global Diffusion of S&T and the Rise of China," in Titus Galama and James Hosek, eds., *Perspectives on U.S. Competitiveness in Science and Technology* (Santa Monica, Calif.: RAND, 2007), pp. 29–36; and Loren Brandt and Eric Thun, "The Fight for the Middle: Upgrading, Competition, and Industrial Development in China," *World Development,* Vol. 38, No. 11 (November 2010), pp. 1555–1574.
55. Gerschenkron, *Economic Backwardness in Historical Perspective,* chap. 1.
56. Ming Zeng and Peter J. Williamson, *Dragons at Your Door: How Chinese Cost Innovation Is Disrupting Global Competition* (Boston: Harvard Business School Press, 2007); and Orit Gadiesh, Philip Leung, and Till Vestring, "The Battle for China's Good-Enough Market," *Harvard Business Review,* September 2007, pp. 80–89.
57. Robert D. Atkinson, "The Globalization of R&D and Innovation: How Do Companies Choose Where to Build R&D Facilities?" testimony given to the Subcommittee on Technology and Innovation, U.S. House of Representatives, October 4, 2007; and Richard Freeman, "Does Globalization of the Scientific/Engineering Workforce Threaten U.S. Economic Leadership?" Working Paper, No. 11457 (Cambridge, Mass.: National Bureau of Economic Research [NBER], July 2005).

quently can outcompete the more affluent advanced society economically and militarily."[58]

Third, some scholars assume that exposure to global competition provides beneficial discipline for developing economies.[59] Unemployment may rise as inefficient firms are weeded out of the market, but those that survive will become more efficient and gain access to wealthy, foreign consumers, thereby enabling a strategy of export-oriented growth. Japan, Korea, and Taiwan all became rich by selling their wares in foreign markets.[60] Declinists expect China to follow suit.

There is much to these arguments, but once again the declinist case tells only part of the story. Globalization has increased developing countries' access to advanced technology, but it has also spawned a new mode of production—globally networked production—that may undercut their long-term technological development.

In the past, industries were mostly self-contained within countries, allowing rising states (e.g., the United States, Germany, Japan, and South Korea) to use targeted investment and trade barriers to cultivate internationally competitive industries.[61] Today, however, such protective barriers may no longer be available because "the world's wealthiest countries—though hardly paragons of free trade—do not tolerate the sorts of protectionism they once did."[62] In other words, "[T]he conventional technological upgrading ladders have been kicked away in the [World Trade Organization] era."[63] The international trade regime affords poor countries some leeway to protect their infant industries, but these

58. Gilpin, *War and Change in World Politics,* p. 179. See also Bitzinger "The Globalization of the Arms Industry"; and Sacha et al., "Economic Reform and the Process of Global Integration."
59. James R. Tybout, "Plant- and Firm-Level Evidence on 'New' Trade Theories," in James Harrigan and Kwan Choi, eds., *Handbook of International Trade* (New York: Blackwell, 2003), pp. 388–415; Romain Wacziarg and Karen Horn Welch, "Trade Liberalization and Growth: New Evidence," *World Bank Economic Review,* Vol. 22, No. 2 (June 2008), pp. 187–231; and Ataman Aksoy and Gonzalo Salinas, "Growth before and after Trade Liberalization," Policy Research Working Paper, No. 4062 (Washington, D.C.: World Bank, November 2006).
60. Anne O. Krueger, "East Asian Experience and Endogenous Growth Theory," in Ito Takatoshi and Krueger, eds., *Growth Theories in Light of the East Asian Experience* (Chicago: University of Chicago Press, 1995), chap. 1; Jeffrey A. Frankel, David Romer, and Teresa L. Cyrus, "Trade and Growth in East Asian Countries: Cause and Effect?" Working Paper, No. 5732 (Cambridge, Mass.: NBER, August 1996); and World Bank, *The East Asian Miracle* (Washington, D.C.: World Bank, 1993), chaps. 3, 6.
61. Alice H. Amsden, *The Rise of the Rest* (New York: Oxford University Press, 2001), pp. 171, 185–188; and Ha-Joon Chang, *The East Asian Development Experience* (New York: Zed, 2006), pp. 31–45, 51–52, 65, 113.
62. Edward S. Steinfeld, "China's Shallow Integration: Networked Production and the New Challenges for Late Industrialization," *World Development,* Vol. 32, No. 11 (April 2004), p. 1981.
63. Ning, *China's Rise,* p. 154. See also Robert Wade, *Governing the Market: Economic Theory and the Role of Government in East Asian Industrialization* (Princeton, N.J.: Princeton University Press, 2003), pp. xv–xlviii, 84, 112.

countries generally lack the legal capacity necessary to take advantage of such provisions.[64]

Lower trade barriers, coupled with advances in technology (particularly digitization), allow lead firms to "slice up the value-chain—to produce a good in a number of stages in a number of locations, adding a little bit of value at each stage."[65] According to the alternative perspective, the result is a global division of labor in which firms in developed states specialize in research and development (R&D), branding, and marketing while outsourcing manufacturing and basic engineering to developing countries.[66]

By farming out production activities to the developing world, U.S. companies reap "dynamic self-reinforcing competitive advantages," tapping pools of cheap labor and investing the savings in technological modernization and rejuvenation.[67] They have become "global flagships," deriving power from their control over proprietary resources and their capacity to coordinate transactions among the various nodes of the production system.[68] By controlling integral technologies and standards, lead firms can discipline lower-tier partners and constrain their development.

Latecomers face pernicious competition not only from powerful incumbents but also from hordes of low-cost competitors from elsewhere in the developing world. The globalization of production makes cheap, high-quality manufacturing a widely available commodity. And because technology diffuses rapidly across borders, shop-floor innovations quickly spread from one manufacturer

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64. Joanne Gowa and Soo Yeon Kim, "An Exclusive Country Club: The Effects of the GATT on Trade, 1950–1994," *World Politics,* Vol. 57, No. 4 (July 2005), pp. 453–478; Marc L. Busch and Eric Reinhardt, "Developing Countries and GATT/WTO Dispute Settlement," *Journal of World Trade,* Vol. 37, No. 4 (August 2003), pp. 719–735; Gregory Shaffer, "Developing Country Use of the WTO Dispute Settlement System," in James Hartigan, ed., *Trade Disputes and the Dispute Settlement Understanding of the WTO* (Bingley, U.K.: Emerald Group, 2009), chap. 7; Christina L. Davis and Sarah Blodgett, "Who Files? Developing Country Participation in GATT/WTO Adjudication," *Journal of Politics,* Vol. 71, No. 3 (July 2009), pp. 1033–1049; and Marc L. Busch, Eric Reinhardt, and Gregory Shaffer, *Does Legal Capacity Matter?: Explaining Dispute Initiation and Antidumping Actions in the WTO,* Issue Paper, No. 4 (Geneva: International Center for Trade and Sustainable Development, 2008).

65. Paul Krugman, "Growing World Trade: Causes and Consequences," *Brookings Papers on Economic Activity,* Vol. 1995, No. 1 (1995), p. 334.

66. Jonathan Eaton and Samuel Kortum, "Innovation, Diffusion, and Trade," Working Paper, No. 12385 (Cambridge, Mass.: NBER, July 2006).

67. Lutao Ning, "China's Leadership in the World ICT Industry," *Pacific Affairs,* Vol. 82, No. 1 (Spring 2009), p. 83. See also Carlota Perez, "Technological Change and Opportunities for Development as a Moving Target," *CEPAL Review,* No. 75 (December 2001), 109–130; and Mike Hobday, Andrew Davies, and Andrea Prencipe, "Systems Integration: A Core Capability of the Modern Corporation," *Industrial and Corporate Change,* Vol. 14, No. 5 (2005), pp. 1109–1143.

68. Alan M. Rugman and Joseph R. D'Cruz, *Multinationals as Flagship Firms: Regional Business Networks* (New York: Oxford University Press, 2000); and Dieter Ernst, "The New Mobility of Knowledge: Digital Information Systems and Global Flagship Networks," *Economics Study Area Working Papers,* No. 56 (Honolulu: East-West Center, 2003).

to another. As competition rises, profit margins and time horizons shrink. In response, fledgling firms eschew long-term investments in R&D and instead focus on lowering costs in existing activities, "mastering open processes instead of developing proprietary ones."[69]

In theory, globalization should help developing countries obtain and absorb advanced technology. In practice, however, this may not occur because some of the knowledge and infrastructure necessary to absorb certain technologies cannot be specified in a blueprint or contained within a machine. Instead they exist in peoples' minds and can be obtained only through "hands-on" experience.[70] The World Bank recently calculated that 80 percent of the wealth of the United States is made up of intangible assets, most notably, its system of property rights, its efficient judicial system, and the skills, knowledge, and trust embedded within its society.[71] If this is the case, then a huge chunk of what separates the United States from China is not for sale and cannot be copied.

Economies and militaries used to consist primarily of physical goods (e.g., conveyor belts and tanks), but today they are composed of systems that link physical goods to networks, research clusters, and command centers.[72] Developing countries may be able to purchase or steal certain aspects of these systems from abroad, but many lack the supporting infrastructure, or "absorptive capacity," necessary to integrate them into functioning wholes.[73] For example, in the 1960s, Cummins Engine Company, a U.S. technological leader, formed joint ventures with a Japanese company and an Indian company to

69. Steinfeld, "China's Shallow Integration," p. 1983. See also Phillippe Aghion, Nick Bloom, Richard Blundell, and Rachel Griffith, "Competition and Innovation: An Inverted-U Relationship," *Quarterly Journal of Economics,* Vol. 120, No. 2 (May 2005), pp. 701–728.

70. Kenneth Arrow, "The Economic Implications of Learning by Doing," *Review of Economic Studies,* Vol. 29, No. 80 (June 1962), p. 155–173. See also Martin Bell and Keith Pavitt, "Technological Accumulation and Industrial Growth: Contrasts between Developed and Developing Countries," *Industrial and Corporate Change,* Vol. 2, No. 2 (1993), pp. 157–210; Howard Pack and Larry E. Westphal, "Industrial Strategy and Technological Change: Theory versus Reality," *Journal of Development Economics,* Vol. 22, No. 1 (June 1986), pp. 87–128; and Robert E. Evenson and Larry E. Westphal, "Technological Change and Technology Strategy," Jere Behrman and T.N. Srinivasan, eds., *Handbook of Development Economics,* Vol. 3 (Amsterdam: Elsevier Science, 1995). For an application of this argument to militaries, see Eliot A. Cohen, "Distant Battles: Modern War in the Third World," *International Security,* Vol. 10, No. 4 (Spring 1986), pp. 164–166.

71. World Bank, *Where Is the Wealth of Nations? Measuring Capital for the 21st Century* (Washington, D.C.: World Bank, 2006), p. 4.

72. Arnold S. Kling and Nick Schultz, *From Poverty to Prosperity: Intangible Assets, Hidden Liabilities, and the Lasting Triumph over Scarcity* (New York: Encounter Books, 2009); and Eliot A. Cohen, "A Revolution in Warfare," *Foreign Affairs,* Vol. 75, No. 2 (March/April 1996), pp. 37–55.

73. Wesley M. Cohen and Daniel A. Levinthal, "Absorptive Capacity: A New Perspective on Learning and Innovation," *Administrative Science Quarterly,* Vol. 35, No. 1 (March 1990), pp. 128–152; Susanto Basu and David N. Weil, "Appropriate Technology and Growth," *Quarterly Journal of Economics,* Vol. 113, No. 4 (November 1998), pp. 1025–1054; and David E. Bloom, David Canning, and Jaypee Sevilla, "Technological Diffusion, Conditional Convergence, and Economic Growth," Working Paper, No. 8713 (Cambridge, Mass.: NBER, January 2002).

produce the same truck engine. The Japanese plant quickly reached U.S. quality and cost levels while the Indian plant turned out second-rate engines at three to four times the cost. The reason, according to Jack Baranson, was the "high degree of technical skill . . . required to convert techniques and produce new technical drawings and manufacturing specifications."[74] This case illustrates how an intangible factor such as skill can lead to significant productivity differences even when two countries have access to identical hardware.

Compared to developing countries such as China, the United States is primed for technological absorption. Its property rights, social networks, capital markets, flexible labor laws, and legions of multinational companies not only help it innovate, but also absorb innovations created elsewhere.[75] Declinists liken the U.S. economic system to a leaky bucket oozing innovations out into the international system. But in the alternative perspective, the United States is more like a sponge, steadily increasing its mass by soaking up ideas, technology, and people from the rest of the world. If this is the case, then the spread of technology around the globe may paradoxically favor a concentration of technological and military capabilities in the United States.

The Empirical Record

For a theory to be useful, significant changes in the key independent variables should produce noticeable changes in the dependent variable. Over the last twenty years, globalization and U.S. hegemony have expanded significantly.[76] If the United States has not declined relative to China during this period, then declinism has failed a critical test and should be regarded as suspect.[77] Such a finding would also provide suggestive evidence in favor of the alternative per-

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74. Jack Baranson, *Manufacturing Problems in India: The Cummins Diesel Experience* (Syracuse, N.Y.: Syracuse University Press, 1967), pp. 58–59, 80–81.

75. Amar Bhidé, *The Venturesome Economy: How Innovation Sustains Prosperity in a More Connected World* (Princeton, N.J.: Princeton University Press, 2008), bk. 2; Paul M. Romer, "Increasing Returns and Long-Run Growth," *Journal of Political Economy*, Vol. 94, No. 5 (October 1986), pp. 1002–1037; and Thomas L. Friedman, *The Lexus and the Olive Tree* (New York: First Anchor, 2000), chap. 17.

76. On globalization, see *KOF Index of Globalization,* http://globalization.kof.ethz.ch/. On hegemony, note that the number of U.S. military bases, foreign countries hosting at least 100 American soldiers, formal U.S. alliances, formal U.S. memberships in international organizations, and U.S. imports and exports have all increased since 1989. On military bases, see U.S. Department of Defense, *Base Structure Report 2009* (Washington, D.C.: Office of the Deputy Under Secretary of Defense, 2009). On foreign hosts of American soldiers, see Tim Kane, *U.S. Troop Deployment Dataset,* http://www.heritage.org/research/reports/2006/05/global-us-troop-deployment-1950-2005. On alliances, see Gibler, *International Military Alliances.* On imports and exports, see Katherine Barbieri, Omar Keshk, and Brian Pollins, *Correlates of War Project Trade Data Set Codebook,* ver. 2, http://www.correlatesofwar.org/.

77. On critical tests, see Harry Eckstein "Case Study and Theory in Political Science," in Fred

spective, though confirmation of the specific hypotheses discussed above requires more detailed analyses. If the United States has maintained its lead over China, it may have done so because of hegemony and globalization, or in spite of them. The analyses that follow cannot rule out the latter possibility. Instead they merely constitute a first-cut test of declinism's fundamental claim that the United States declines as globalization and U.S. hegemonic burdens increase.

How should national power be measured? In this article, power is defined in terms of resources rather than influence. Resources, of course, are simply the raw materials that underlie power relationships, and whether these resources produce desired outcomes depends on the context and manner in which they are employed. As Nye explains, the poker player with the best cards or the most chips does not necessarily win every hand, but possessing these resources certainly helps, so it is important to figure out who has what.[78]

How should the U.S.-China balance be measured? In 2000, the RAND Corporation conducted a comprehensive review of studies on national power and concluded that three interrelated sets of resources are most vital in international politics: wealth, innovation, and conventional military capabilities.[79]

Wealth functions as a source of power because it insulates a state from dependence on others and provides things of value that can be used in bargaining situations. As Robert Keohane and Joseph Nye point out, economic interdependence involves relations of asymmetric vulnerability.[80] Wealthy states are better equipped to wield market access and economic sanctions as tools of influence over others. They also have more capital to fund technological innovation and military modernization. All states face the dilemma of balancing short-term spending against long-term economic growth. This predicament, however, is less acute for wealthy states, which can sustain significant investments in innovation and military power with a relatively small percentage of their total resources.

The ability to innovate, defined as the creation of new products and methods of production, also constitutes a source of power. Like wealthy states, innovative countries are less dependent on others and more capable of producing goods that others value. Innovation also creates wealth and tends to beget further innovation as individual discoveries spawn multiple derivative products and improvements. Innovative activity therefore tends to cluster in

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Greenstein and Nelson Polsby, eds., *The Handbook of Political Science,* Vol. 7: *Strategies of Inquiry* (Menlo Park, Calif.: Addison-Wesley, 1975), pp. 79–137.

78. Nye, *The Future of Power,* chap. 1.

79. Ashley J. Tellis, Janice Bially, Christopher Layne, and Melissa McPherson, *Measuring National Power in the Postindustrial Age* (Santa Monica, Calif.: RAND, 2000).

80. Robert O. Keohane and Joseph S. Nye, *Power and Interdependence* (Boston: Little, Brown, 1977).

particular places and provide certain countries with significant technological and military advantages. As Joshua Goldstein has shown, "The country creating a major cluster of innovations often finds immediate military applications and both propels itself to hegemonic status and maintains that status by that mechanism."[81]

Military power is generally considered to be the "ultima ratio" of power because it functions as a decisive arbiter of disputes when it is used and shapes outcomes among states even when it is not. Military capabilities can be used to destroy, to back up coercive threats, and to provide protection and assistance. When performed well, these actions can alter the behavior of other states. Military superiority can also generate wealth by, for example, making a country a more secure and attractive place to invest, as well as provide the means to coerce other countries into making economic concessions. The RAND study found that nuclear weapons were of less importance than conventional capabilities for national influence. Thus, I do not consider them in the following analyses. The authors of the RAND study explain: "Even though nuclear weapons have become the ultima ratio regum in international politics, their relative inefficacy in most situations other than those involving national survival implies that their utility will continue to be significant but highly restricted. The ability to conduct different and sophisticated forms of conventional warfare will, therefore, remain the critical index of national power because of its undiminished utility, flexibility, responsiveness and credibility."[82]

The key point is that national power is multifaceted and cannot be measured with a single or a handful of metrics. In the analyses that follow, I allot more space to economic indicators than to military indicators. This is not because economic power is necessarily more important than military power, but rather because most declinist writings argue that the United States is in economic, not military, decline. Moreover, military power is ultimately based on economic strength. International relations scholars tend to view civilian and military realms as separate entities, but militaries are embedded within economic systems. In a separate study, I show that countries that excel in producing commercial products and innovations also tend to excel in producing military force.[83] Part of this advantage stems from greater surplus wealth, which allows

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81. Joshua S. Goldstein, *Long Cycles: Prosperity and War in the Modern Age* (New Haven, Conn.: Yale University Press, 1988), p. 140. See also Nicole Bousquet, "From Hegemony to Competition: Cycles of the Core?" in Terrence K. Hopkins and Immanuel Wallerstein, eds., *Processes of the World-System* (Beverly Hills, Calif.: Sage, 1980); and William R. Thompson, "Long Waves, Technological Innovation, and Relative Decline," *International Organization,* Vol. 44, No. 2 (Spring 1990), pp. 201–233.
82. Ibid., p. 43.
83. Michael Beckley, "Economic Development and Military Effectiveness," *Journal of Strategic Studies,* Amos Perlmutter Prize Essay, Vol. 33, No. 1 (February 2010), pp. 43–79.

rich states to sustain large military investments. Economically developed states, however, also derive military benefits from their technological infrastructures, efficient production capacities, advanced data analysis networks, stocks of managerial expertise, and stable political environments. In short, economic indicators are, to a significant degree, measures of military capability. Focusing on the former, therefore, does not imply ignoring the latter.

WEALTH

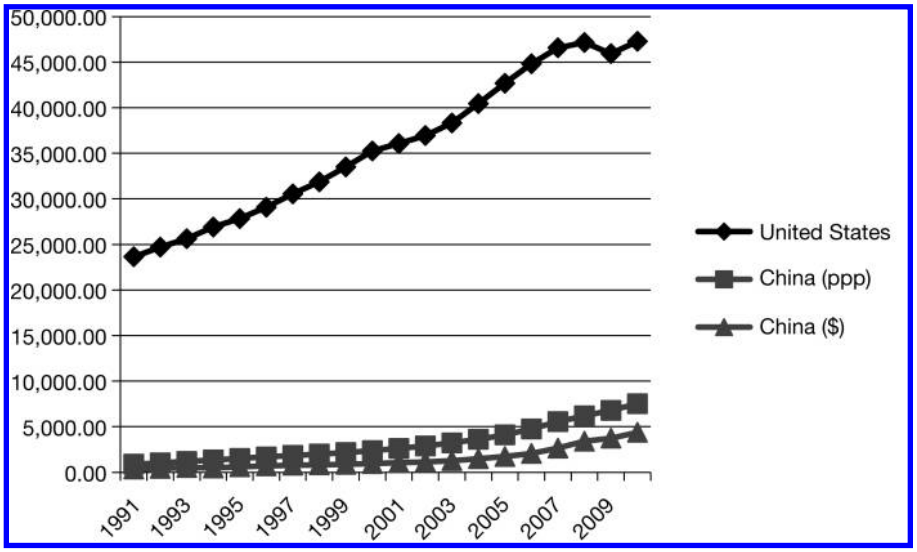
The case for the decline of the United States and the rise of China rests heavily on a single statistic: GDP. Over the last twenty years, China's GDP has risen relative to the United States' in terms of purchasing power parity (PPP), though it has declined in real terms.[84] Regardless of which measure is used, however, most projections have China overtaking the United States as the world's largest economy before 2050, and some as early as 2015.[85]

Economic size, however, does not necessarily make China a contender for superpower status. After all, China was the largest economy in the world throughout most of its "century of humiliation," when it was ripped apart by Western powers and Japan. The United Kingdom, on the other hand, ruled a quarter of the globe for more than a century, but was never, even at its peak, the largest economy in the world. Britain's GDP was far smaller than China's and India's for all of the eighteenth century and much of the nineteenth century.[86] Britain, however, was able to establish imperial control over India and to defeat China militarily, imposing unequal treaties on Beijing, acquiring Hong Kong and various other concessions, and establishing a sphere of influence in East Asia. This dominance stemmed not from the absolute size of Britain's economy, but from its superior level of economic development, measured in terms of per capita income, which was the highest in the world and several times higher than China's and India's at the time.[87]

This is not to say that size is irrelevant. Luxembourg's per capita income is almost double that of the United States, but its tiny population precludes it from raising a meaningful army, let alone entering the ranks of the great pow-

84. Some scholars claim that projections of GDP growth from a PPP base exaggerate China's future economic size. See Richard N. Cooper, "Whither China?" *Japan Center for Economic Research Bulletin,* September 2005; and Albert Keidel, *China Rising: Fact and Fiction,* Policy Brief, No. 61 (Washington, D.C.: Carnegie Endowment for International Peace, 2008).
85. See, for example, Chestnut and Johnston, "Is China Rising?"; *Economist Intelligence Unit,* "All Country Data Set," 2009; Robert Fogel, "$123,000,000,000,000," *Foreign Policy,* No. 177 (January/February 2010), pp. 71–75; and Jim O'Neil and Anna Stupnytska, *The Long-Term Outlook for the BRICs and N-11,* Post Crisis Global Economics Paper, No. 192 (December 2009).
86. For historical GDP data, see Angus Maddison, *Statistics on World Population, GDP, and Per Capita GDP, 1–2008AD,* http://www.ggdc.net/MADDISON/oriindex.htm.
87. Ibid.

Figure 1. Per Capita Income, 1991–2010 ($ in current prices)



SOURCE: International Monetary Fund, World Economic Outlook Database, October 2010. PPP stands for purchasing power parity.

ers. It is, however, important to recognize that GDP is not synonymous with national power, and that countries with larger economies do not necessarily have more resources at their disposal. Half a billion peasants will produce a large volume of output, but most of it will be immediately consumed, leaving little left over for national purposes. As Klaus Knorr argued, what matters for national power is not wealth, but "surplus wealth."[88] It is therefore significant that the average Chinese citizen is more than $17,000 poorer relative to the average American than he was in 1991 (see figure 1).

On the other hand, the United States has accumulated great wealth in part by borrowing from abroad at an unprecedented rate. According to the Congressional Budget Office, the United States' public debt will remain greater than 60 percent of GDP through 2020.[89] In the coming years, U.S. policymakers will be forced to either decrease public spending or allow interest costs on the national debt to rise ruinously. Either option will retard economic growth. Managing such high levels of debt will be especially difficult if the

88. Klaus Knorr, *The War Potential of Nations* (Princeton, N.J.: Princeton University Press, 1956), pp. 231–239.
89. Congressional Budget Office (CBO), *The Budget and Economic Outlook: An Update* (Washington, D.C.: CBO, August 2011).

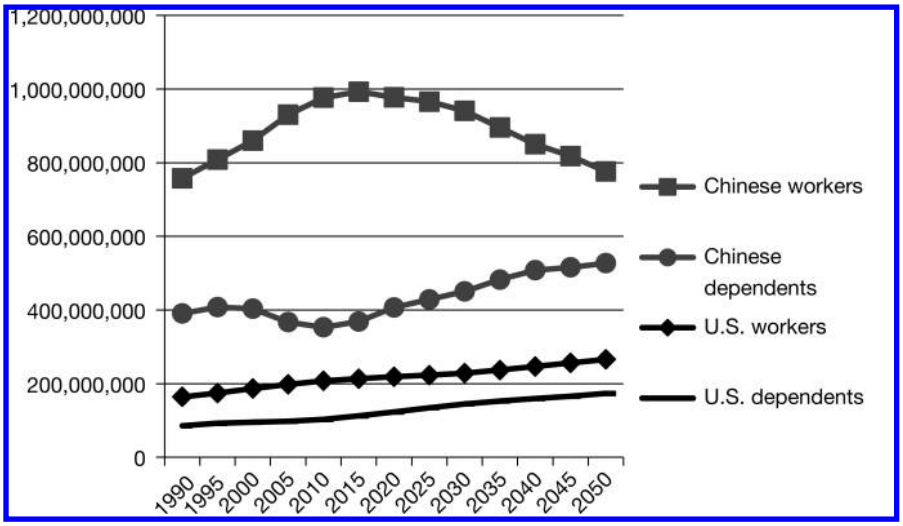
dollar loses its position as the international reserve currency, an outcome that some experts think is likely.[90]

At first glance, China's fiscal future appears much brighter than the United States'. The Chinese economy grew 8 percent annually throughout the global financial crisis, and its reported debt-to-GDP ratio is only 19 percent.[91] China's true level of public debt, however, is likely much higher than reported because a great deal of state spending is funneled through investment entities connected to local governments. Estimates that take this spending into account put China's debt-to-GDP ratio between 75 and 150 percent.[92] The Chinese government projects annual growth rates of 7 percent between now and 2030. Some prominent investors and economists, however, believe Chinese growth will plunge to 2 to 5 percent within the next decade following the collapse of a "debt-fueled bubble."[93]

These predictions are speculative and may turn out to be overly pessimistic.[94] What is more certain, however, is that several factors that allowed for rapid Chinese growth (e.g., a surplus of cheap labor and capital, expanding export markets abroad, and sufficient water supplies) are disappearing.[95] Chief among these factors is China's "demographic dividend."[96] In the 1950s and

90. For a balanced assessment on this issue, see Hellener and Kirshner, *The Future of the Dollar.*
91. International Monetary Fund, *World Economic Outlook Database,* http://www.imf.org/external/ns/cs.aspx?id=28.
92. Carl E. Walter and Fraser J.T. Howie, *Red Capitalism: The Fragile Foundation of China's Extraordinary Rise* (Hoboken, N.J.: John Wiley and Sons, 2011); Victor Shih, "China's 8,000 Credit Risks," *Wall Street Journal Asia,* February 9, 2010; "China's Hidden Debt Risks 2012 Crisis, Northwestern's Shih Says," *Bloomberg News,* March 2, 2010; "Moody's Sees Much Bigger Local Debt in China," *New York Times,* July 5, 2011; and Simon Rabinovitch, "Emphasis on Explicit Debt Hides Extent of Beijing's Local Liabilities," *Financial Times,* June 28, 2011.
93. For a balanced debate among seven experts on this topic, see "China's Debt Monster," *New York Times,* July 6, 2011, http://www.nytimes.com/roomfordebate/2011/07/06/chinas-debt-monster. See also "Rogoff Says China Crisis May Trigger Regional Slump," *Bloomberg News,* February 24, 2010; Geoff Dyer, "No One Home," *Financial Times,* February 22, 2010; Andrew Batson, "Stimulus Dilemma for China," *Wall Street Journal,* March 21, 2009; and David Barboza, "Contrarian Investor Sees Economic Crash in China," *New York Times,* January 7, 2010.
94. On the argument that China will continue to grow rapidly, see Jonathan Anderson, "Beijing's Exceptionalism," *National Interest,* No. 100 (March/April 2009), pp. 19–32; Yang Yao, "Serious, but Not Devastating," *New York Times,* July 18, 2011; Shuanglin Lin, "The Investment Will Pay Off," *New York Times,* July 7, 2011; and Fogel, "$123,000,000,000,000."
95. Babones, "The Middling Kingdom"; Barry Naughton, "Five Reasons China Is at the Peak of Its Growth Potential," presentation at the Summer Training Workshop on the Relationship between National Security and Technology in China, University of California, San Diego, June 25, 2010; David O. Beim, "The Future of Chinese Growth," paper presented to the World Economic Roundtable, New America Foundation, Washington, D.C., March 1, 2011; and Michael Pettis, "Chinese Growth in 2011," *China Financial Markets,* December 19, 2010. For a debate on the future of Chinese growth, see Minxin Pei and Jonathan Anderson, "The Color of China," *National Interest,* No. 100 (March/April 2009), pp. 13–32.
96. Feng Wang, "China's Population Destiny: The Looming Crisis," *Current History,* September 2010, pp. 244–251.

Figure 2. Working Age and Dependent Populations, 1990–2050



SOURCE: United Nations, *World Population Prospects: The 2008 Revision Population Database* (New York: United Nations, 2010).

1960s, the Chinese government encouraged Chinese women to bear multiple children to boost the working-age population. In the 1970s, however, the Chinese government reversed course and instituted the one-child policy. As a result, China will soon confront the most severe aging process in human history. Within twenty years, China will have 300 million pensioners, causing the ratio of workers per retiree to plummet from 8 to 1 today to 2 to 1 by 2040.[97] The fiscal cost of this swing in dependency ratios may exceed 80 to 100 percent of China's GDP.[98]

The United States, by contrast, "can be said to be a young and even a developing country."[99] Its working age population will grow by 17 percent over the next forty years while that of all the other major powers (except India) will decline (see figure 2).[100] Moreover, its pension system is better funded, its public welfare commitments more modest, and its citizens more productive (in

97. Jonathan Anderson, "How to Think about China," *UBS Investment Research,* January 2006, chap. 2.
98. Ibid., pp. 26–28.
99. Richard N. Cooper, "Global Imbalances: Globalization, Demography, and Sustainability," *Journal of Economic Perspectives,* Vol. 22, No. 3 (Summer 2008), p. 111.
100. United Nations, *World Population Prospects: The 2008 Revision Population Database* (New York: United Nations, 2010), http://esa.un.org/unpp/.

terms of hours worked and years employed) than any other major power.[101] "Global aging," Mark Haas writes, "is therefore not only likely to extend U.S. hegemony . . . but deepen it as . . . other states are likely to fall even farther behind."[102]

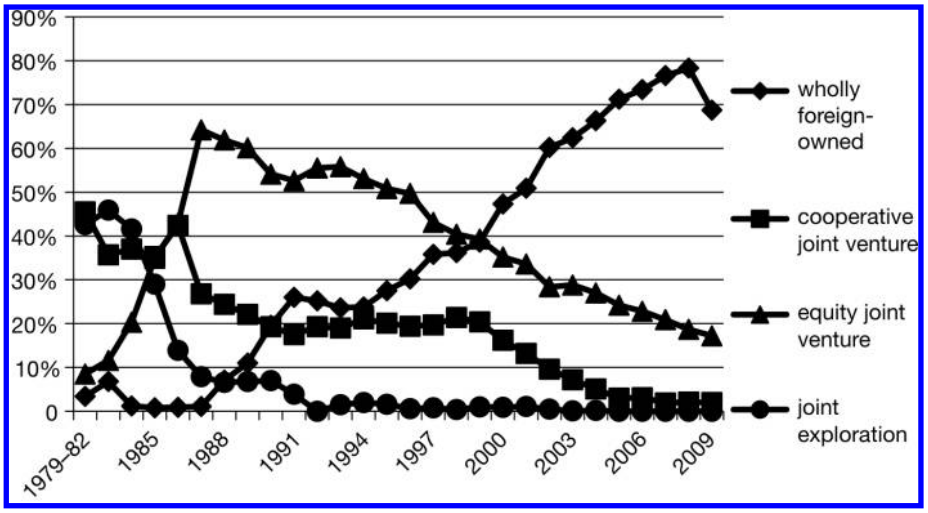
Declinists claim that a rising GDP helps China attract foreign investment and compel foreign firms to transfer advanced technology to Chinese enterprises.[103] The fundamental assumption behind this claim is that a nation's GDP reflects the size of its domestic market. Market size, however, is a measure of consumption whereas GDP is a measure of production. China's citizens produce many goods, but they consume relatively few. The Chinese market is much larger than it used to be, but it has shrunk relative to the U.S. market over the last two decades: China now imports less compared to the United States than it did in 1991.[104]

More important, China's bargaining power vis-à-vis foreign firms seems to be waning.[105] Wholly foreign-owned enterprises now account for 70 percent of foreign direct investment (FDI) flowing into China, whereas joint ventures between foreign and Chinese firms have steadily declined (see figure 3). Such rampant foreign ownership never occurred in past cases of successful technological development (Japan and Korea grew with almost zero FDI or foreign ownership) and with good reason: wholly foreign-owned enterprises, unlike joint ventures, are generally under no obligation to transfer technology to local partners and may crowd domestic firms out of the market.[106]

In sum, the United States is now wealthier compared to China than it was in 1991. This prediction runs counter to declinism and provides suggestive sup-

101. Mark L. Haas, "A Geriatric Peace? The Future of U.S. Power in a World of Aging Populations," *International Security,* Vol. 32, No. 1 (Summer 2007), pp. 138–140.
102. Ibid., p. 113. See also Richard Jackson, "The Aging of China," *Critical Questions* (Washington, D.C.: Center for Strategic and International Studies, April 20, 2010).
103. Jacques, *When China Rules the World,* pp. 174, 206; James Kynge, *China Shakes the World: A Titan's Rise and Troubled Future—and the Challenge for America* (Boston: Houghton Mifflin, 2006), pp. 108–110, 112; Oded Shenkar, *The Chinese Century: The Rising Chinese Economy and Its Impact on the Global Economy, the Balance of Power, and Your Job* (Upper Saddle River, N.J.: Wharton School, 2006), pp. 66–68; and Subramanian, "Inevitable Superpower."
104. World Trade Organization Statistics Database.
105. Elissa Braunstein and Gerald Epstein, "Bargaining Power and Foreign Direct Investment in China: Can 1.3 Billion Consumers Tame the Multinationals?" Working Paper, No. 13 (New York: Center for Economic Policy Analysis, August 2002).
106. Yasheng Huang, *FDI in China: An Asian Perspective* (Singapore: Institute of Southeast Asian Studies, 1998); Edward S. Steinfeld, *Playing Our Game: Why China's Economic Rise Doesn't Threaten the West* (New York: Oxford University Press, 2010), pp. 29, 95, 122, 140; Kim, *Imitation to Innovation,* chap. 2; Chang, *East Asian Development Experience,* chap. 1; Koen de Backer and Leo Sleuwaegen, "Does Foreign Direct Investment Crowd Out Domestic Entrepreneurship?" *Review of Industrial Organization,* Vol. 22, No. 1 (February 2003), pp. 67–84; and Manuel R. Agosin and Ricardo Mayer, "Foreign Investment in Developing Countries: Does It Crowd In Domestic Investment?" *Oxford Development Studies,* Vol. 33, No. 2 (June 2005), pp. 149–162.

Figure 3. Modes of FDI in China, 1979–2009 (%)



SOURCES: Barry Naughton, *The Chinese Economy: Transitions and Growth* (Cambridge, Mass.: MIT Press, 2007), chap. 17; and "Chapter by Chapter: Data and Supplementary Materials," http://irps.ucsd.edu/faculty/faculty-publications/chinese-economy/chapter-by-chapter-data-supplementary-materials/.

port for the alternative perspective. The trends discussed above may change, and historians may one day look back on the recent financial crisis as the beginning of a massive transfer of wealth and power from the United States to China. Such an outcome will depend on, among other things, the relative rates of innovation in each country.

INNOVATION

Declinists claim the United States produces too few scientists and engineers (and too many lawyers and bankers) while China engages in "human-resource leapfrogging, in which large populous developing countries employ enough scientists and engineers to compete with the advanced countries in the high-tech vanguard sectors."[107] Some analysts compare China with nineteenth-century Germany, which surged ahead of Britain by training massive numbers of scientists and engineers.[108] For example, by 1900, German chemical firms typically employed fifty to seventy researchers, allowing them to conduct

107. Freeman, "Does Globalization of the Scientific/Engineering Workforce Threaten U.S. Economic Leadership?" pp. 20–21. For a review of recent studies that make these claims, see Galama and Hosek, *U.S. Competitiveness in Science and Technology*, chap. 1.
108. I thank an anonymous reviewer for pointing this out.

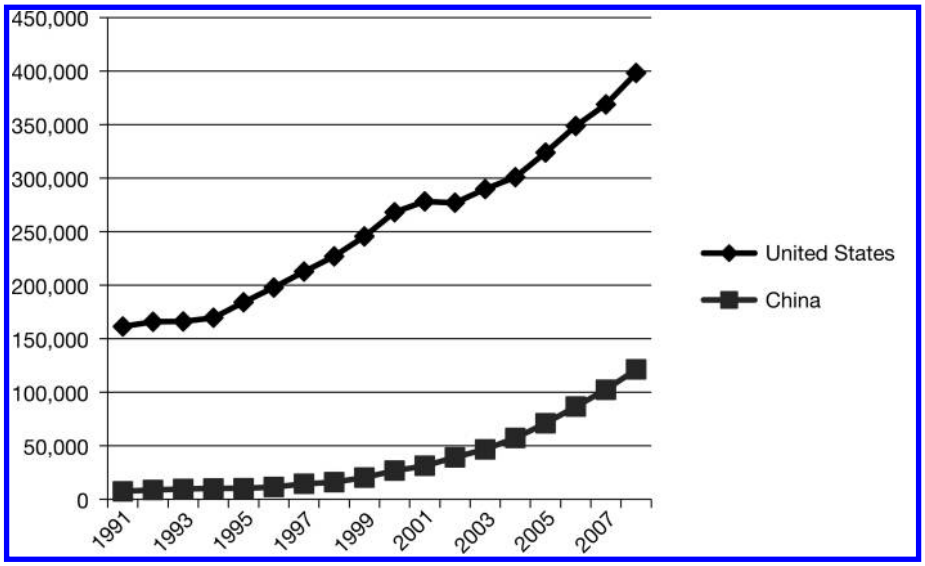
R&D while expecting to discard 90 percent of the results.[109] Today, China seems poised for scientific dominance, employing more scientists and engineers than any other country and tripling its share of world scientific articles over the last ten years (from 2 percent to 6 percent). Over the same time period, the United States' share declined from 34 percent to 28 percent.[110]

There are, however, reasons to question comparisons between imperial Germany and contemporary China. For starters, official Chinese statistics overstate the volume of China's scientific resources. Half of China's "engineers" are auto mechanics or graduates of two-year vocational programs (*zhuanke*).[111] In addition, data on China's R&D spending are inflated because they are based on the real purchasing power of the Chinese yuan even though most research equipment is purchased on international markets.[112] Nevertheless, the United States increased its lead in terms of R&D spending over the last twenty years (see figure 4), and still accounts for 50 percent of the world's most highly cited scientific articles.[113]

Over the next few decades, Chinese scientific research will increase significantly. In fact, it is the law: the Chinese government has decreed that, by 2020, R&D expenditures will constitute 2.5 percent of GDP and China will rank among the top five countries in terms of scientific article output.[114] Top-down decrees and resource infusions, however, will not necessarily turn China into an innovation powerhouse.[115] After all, imperial Germany coupled size with sophistication, producing not only many scientists but also world-class research. Evidence to date suggests China tends to prioritize the former at the expense of the latter. The rush to increase the quantity of Chinese scientists, for

109. Henri Hauser, *Germany's Commercial Grip on the World* (New York: Scribner, 1917), pp. 40–41.
110. For data on scientists and scientific journal articles, see National Science Board, *Science and Engineering Indicators 2010* (Arlington, Va.: National Science Foundation, 2010).
111. Gary Gereffi and Vivek Wadhwa, "Framing the Engineering Outsourcing Debate: Placing the United States on a Level Playing Field with China and India," December 2005, http://www.nae.edu/File.aspx?id=10287; and Carl Bialik, "Outsourcing Fears Help Inflate Some Numbers," *Wall Street Journal*, August 26, 2005, http://online.wsj.com/article/1,,SB112488992778121801,00.html?mod=COLUMN.
112. Bruce Einhorn, "Is OECD Hyping China's R&D Spending?" *Business Week*, December 7, 2007, http://www.businessweek.com/blogs/eyeonasia/archives/2006/12/is_oecd_hyping_chinas_rd_spending.html.
113. National Science Board, *Science and Engineering Indicators 2008* (Arlington, Va.: National Science Foundation, 2008), appendix table 5-38.
114. State Council of the People's Republic of China, *Guojia zhongchangji kexue fazhan guihua gangyao, 2006–2020* [National medium- and long-term science and technology development program outline, 2006–2020], February 9, 2006. See also Hao Xin and Gong Yidong, "China Bets on Big Science," *Science*, March 17, 2006, pp. 1548–1549.
115. For a critical assessment of China's science and technology plan, see Sylvia Schwaag Serger and Magnus Breidne, "China's Fifteen-Year Plan for Science and Technology: An Assessment," *Asia Policy*, No. 4 (July 2007), pp. 135–164.

Figure 4. Total Research and Development Spending, 1991–2008 (current PPP $, millions)



SOURCE: OECD Main Science and Technology Indicators. PPP stands for purchasing power parity.

example, has reduced the quality of their education, as evidenced by sharp declines in teacher-student and funding-per-student ratios.[116] Moreover, China's determination to boost its article output has fostered "a Wild West climate where top researchers, under intense pressure to produce, are tempted to fake results or copy the works of others."[117] Chinese scientists are "preoccupied with quick outcomes and immediate returns," and as a result, "quantitative gains in Chinese research productivity have not always been matched by qualitative gains."[118] According to a former Chinese biochemist turned whistle-

116. Simon and Cao, *China's Emerging Technological Edge,* chap. 4.
117. "Science Friction," *Business Week,* May 29, 2006, http://www.businessweek.com/magazine/content/06_22/b3986077.htm. See also "Faking It," *Economist,* May 18, 2006, http://www.economist.com/node/6941786; Heping Jian, "Frequent Cases Force China to Face Up to Scientific Fraud," *Nature Medicine,* Vol. 12, No. 8 (August 2006), p. 867; Cheol-Sung Lee and Andrew Schrank, "Incubating Innovation or Cultivating Corruption?" *Social Forces,* Vol. 88, No. 3 (March 2010), pp. 1231–1255; Zhu Zhe, "Plagarism, Fake Research Plague Academia," *China Daily,* March 15, 2006; Chinese Academia Ghost-Writing 'Widespread,'" BBC, January 5, 2010; Rui Yang, "Corruption in China's Higher Education: A Malignant Tumor," *International Higher Education,* Spring 2005, pp. 18–20; and Paul Mooney, "Plagued by Plagarism," *Chronicle of Higher Education,* May 19, 2006, pp. 45–46.
118. Cong Cao, Richard P. Suttmeier, and Denis Fred Simon, "China's 15-Year Science and Technology Plan," *Physics Today,* Vol. 59, No. 12 (December 2006), p. 40. See also Mu-Min Poo,

blower, "Misconduct is so widespread among Chinese academics that they have almost become used to it."[119] Indeed, a significant portion of new R&D spending has simply disappeared because China's Ministry of Science and Technology lacks the capacity to monitor the flood of new research grants.[120] According to the most comprehensive study on Chinese scientific research, the result of all these deficiencies is that "much of the work coming out of Chinese laboratories and research institutes still tends to be not yet close to the cutting edge or to be derivative of what has been done elsewhere, with minor new contributions."[121]

In the late 1800s, German universities ranked among the best in the world and attracted talent from abroad.[122] China, by contrast, currently suffers from a massive brain-drain problem. The number of Chinese students enrolled in universities in the United States increased by an average of 9 percent annually between 1996 and 2011 and 20 percent annually between 2007 and 2011.[123] Declinists assume these students return to China after graduating and therefore "threaten U.S. technological leadership."[124] But 90 percent of the Chinese students who received a science or engineering Ph.D. from an American university between 1987 and 2007 joined the American workforce, and these students were typically China's best and brightest.[125]

China's government recently announced its intention to develop a set of world-class universities to attract young talent from around the world.[126] At present, however, the United States still dominates higher education. A study by the London-based *Times Higher Educational Supplement* says the United States is home to fifteen of the top twenty universities in the world.[127] Accord-

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"Cultural Reflections," *Nature,* March 11, 2004, pp. 204–205; and Serger and Breidne, "China's Fifteen-Year Plan."

119. Quoted in, "Science Friction."

120. Cao, Suttmeier, and Simon, "China's 15-Year Science and Technology Plan."

121. Denis F. Simon and Cong Cao, *China's Emerging Technological Edge: Assessing the Role of High-End Talent* (New York: Cambridge University Press, 2009), p. 103.

122. C.E. McClelland, *State, Society, and University in Germany, 1700–1914* (New York: Cambridge University Press, 1980), chaps. 7–8; and Clive Trebilock, *The Industrialization of the Continental Powers, 1780–1914* (New York: Longman, 1981), pp. 62–67.

123. International Institute of Higher Education, *Open Doors: Report on International Educational Exchange, 2011,* http://www.iie.org/en/Research-and-Publications/Open-Doors/Data/Fact-Sheets-by-Country.

124. Freeman, "Does Globalization of the Scientific Engineering Workforce Threaten U.S. Economic Leadership?" p. 25.

125. For data on the stay rates of Chinese students, see Michael G. Finn, "Stay Rates of Foreign Doctorate Recipients from U.S. Universities, 2007," Oak Ridge Institute for Science and Education, 2010. On the argument that Chinese students that come to the United States are China's top students, see Simon and Cao, *China's Emerging Technological Edge,* chap. 6.

126. Richard C. Levin, "Top of the Class," *Foreign Affairs,* Vol. 89, No. 3 (May/June 2010), pp. 63–76.

127. "Times Higher Education-QS World University Rankings, 2010–2011," http://www.timeshighereducation.co.uk.

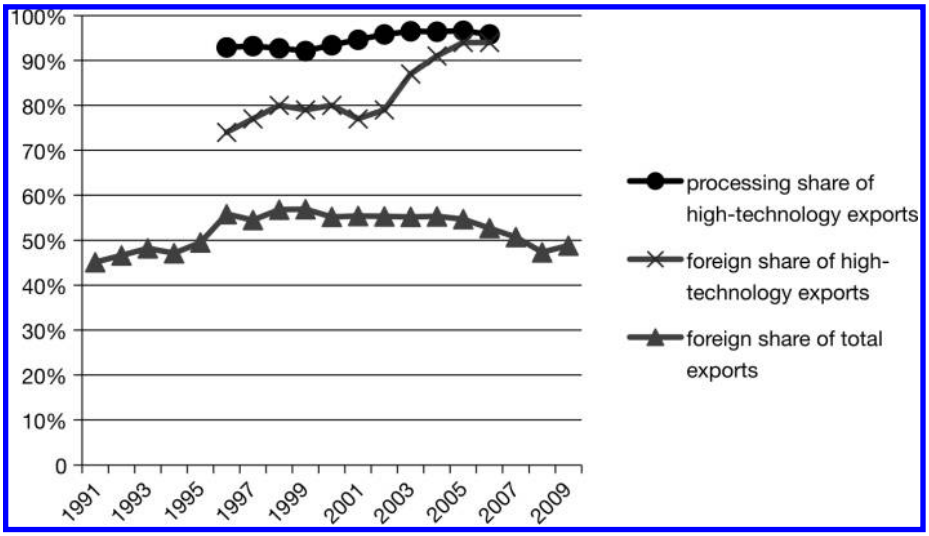
ing to a study by China's Jiao Tong University in Shanghai, the United States has seventeen of the top twenty. Among the top 100 universities in the world, the United States has either thirty-three or fifty-four depending on which survey is consulted; China has two or zero.[128]

It is far from clear, therefore, that China is catching up to the United States in terms of basic scientific research. More important, such a trend would not necessarily affect the balance of power. After all, what ultimately matters is not scientific superiority but technological superiority—the ability to produce and use commercially viable and militarily relevant innovations.[129] In the nineteenth century, German scientists excelled at turning scientific breakthroughs into practical products, developing major innovations in the chemical, electrical, and industrial dye industries that formed what many scholars now refer to as the "second industrial revolution."[130] Today, scientific superiority is not necessary for technological superiority because published articles circulate globally—they sit in searchable databases and can be obtained by anyone with access to a major library—and it is insufficient because most scientific breakthroughs are useless in isolation from lower-level innovations and infrastructure.[131] Thus, the ability to produce scientific breakthroughs may be less important than the ability to capitalize on them.[132]

On first glance, China's emergence as the world's leading exporter of high-technology products suggests it has capitalized on its scientific investments and become an "advanced-technology superstate,"[133] perhaps even "the world's

128. Institute of Higher Education of Shanghai Jiao Tong University, "Academic Ranking of World Universities," http://www.arwu.org/ARWU2010.jsp.
129. Tellis et al., *Measuring National Power in the Postindustrial Age,* p. 22.
130. Joel Mokyr, *The Lever of Riches* (New York: Oxford University Press, 1990), chap. 6. See also Trebilock, *The Industrialization of the Continental Powers¸1780–1914,* chap. 2; and Tom Kemp, *Industrialization in Nineteenth-Century Europe* (New York: Longman, 1985), chap. 4. On the electrical and industrial dye industries, see Kennedy, *The Rise and Fall of the Great Powers,* p. 211. On the chemical industry, see L.F. Haber, *The Chemical Industry during the Nineteenth Century* (Oxford: Oxford University Press, 1958); Peter J. Hughill and Veit Bachmann, "The Route to the Techno-Industrial World Economy and the Transfer of German Organic Chemistry to America Before, During, and Immediately After World War I," *Comparative Technology Transfer and Society,* Vol. 3, No. 2 (August 2005), pp. 158–186; and Johann Peter Murmann and Ralph Landau, "On the Making of Competitive Advantage: The Development of the Chemical Industries in Britain and Germany since 1850," in Ashish Arora, Ralph Landau, and Nathan Rosenberg, eds., *Chemicals and Long-Term Economic Growth* (New York: Wiley, 1998), chap. 2.
131. Bhidé, *Venturesome Economy.*
132. Nick Bloom, Raffaella Sadun, and John Van Reenan, "Americans Do I.T. Better: U.S. Multinationals and the Productivity Miracle," Discussion Paper, No. 788 (London: Center for Economic Performance, London School of Economics, May 2007); Lan Xue, "China: The Prizes and Pitfalls of Progress," *Nature,* July 2008, pp. 398–401; and Simon and Cao, *China's Emerging Technological Edge,* pp. 14–15.
133. Ernest H. Preeg, *The Emerging Chinese Advanced Technology Superstate* (Arlington, Va.: Manufactures Alliance/MAPI, 2008). See also Dani Rodrick, "What's So Special about China's Exports?" *China and World Economy,* Vol. 14, No. 5 (September 2006), pp. 1–19; and Peter K. Schott, "The Relative Sophistication of China's Exports," *Economic Policy* (January 2008), pp. 5–49;

Figure 5. Composition of China's Exports, 1991–2009 (%)



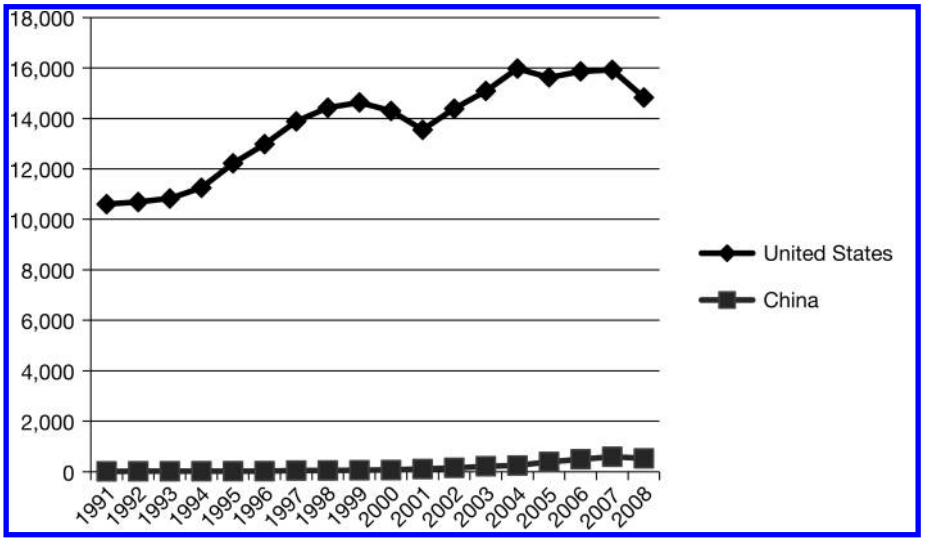
SOURCES: On high-technology exports, see Michael J. Ferrantino, Robert B. Koopman, Zhi Wang, and Falan Yinug, "The Nature of U.S.-China Trade in Advanced Technology Products," *Comparative Economic Studies,* Vol. 52 (June 2010), pp. 207–224. On total exports, see Barry Naughton, *The Chinese Economy: Transitions and Growth* (Cambridge, Mass: MIT Press, 2007), chap. 17; and "Chapter by Chapter: Data and Supplementary Materials," http://irps.ucsd.edu/faculty/faculty-research-projects/chinese-economy/chapter-by-chapter/chapter-17.htm.

leading technology-based economy."[134] On closer inspection, however, it becomes clear that China's high-technology exports are "not very Chinese, and not very high-tech"—more than 90 percent are produced by foreign firms and consist of imported components that are merely assembled in China, a practice known as "export processing."[135] These percentages have increased over time, a trend that suggests Chinese firms are falling further behind foreign competitors. Moreover, approximately 50 percent of China's total exports are produced by foreign enterprises (see figure 5). By comparison, foreign en-

134. Alan L. Porter, Nils C. Newman, J. David Roessner, David M. Johnson, and Xiao-Yin Jin, "International High-Tech Competitiveness: Does China Rank #1?" *Technology Analysis and Strategic Management,* Vol. 21, No. 2 (2009), pp. 173–193.

135. Daniel H. Rosen, "Low-Tech Bed, High-Tech Dreams," *China Economic Quarterly* Q4 (July 2004), pp. 20–27. See also Michael J. Ferrantino, Robert B. Koopman, Zhi Wang, and Falan Yinug, "The Nature of U.S.-China Trade in Advanced Technology Products," *Comparative Economic Studies,* Vol. 52 (June 2010), pp. 207–224; Ministry of Science and Technology of the People's Republic of China (PRC), *China Science and Technology Statistics Data Book, 2009* (Beijing: Ministry of Science and Technology, PRC, 2009); Mary Amiti and Caroline Freund, "An Anatomy of China's Export Growth," Policy Research Working Paper, No. 4628 (Washington, D.C.: World Bank, May

Figure 6. Triadic Patents, 1991–2008



SOURCE: OECD Main Science and Technology Indicators.

terprises produced less than 25 percent of Taiwan and South Korea's manufactured exports in the 1970s.[136]

Chinese technological stagnation is also evident in sales and patent statistics. From 1991 to 2008, Chinese firms' sales of new products as a share of total sales revenues remained flat at 15 percent.[137] In the United States, by contrast, new products account for 35 to 40 percent of sales revenue.[138] The Chinese government grants the majority of its invention patents to foreign firms even though Chinese firms are five times more numerous.[139] This result is all the more startling because many foreign firms do not seek Chinese patents. Instead they seek "triadic patents," which are simultaneously recognized by the patent offices of the three largest markets for high-technology products

2008); Judith M. Dean, K.C. Fung, and Zhi Wang, "Measuring the Vertical Specialization in Chinese Trade," Office of Economics Working Paper, No. 2007-01-A (Washington, D.C.: U.S. International Trade Commission, January 2007); and Robert Koopman, Zhi Wang, Shang-Jin Wei, "How Much of Chinese Exports Is Really Made in China? Assessing Domestic Value-Added When Processing Trade Is Pervasive," Working Paper, No. 14109 (Washington, D.C.: NBER, June 2008).

136. George J. Gilboy, "The Myth Behind China's Miracle," *Foreign Affairs,* Vol. 83, No. 4 (July/August 2004), p. 38.

137. *Zhongguo keji tongji nianjian 2009* [China statistical yearbook on science and technology 2009] (Beijing: China Bureau of Statistics, 2010), pp. 94–95.

138. Gilboy, "The Myth Behind China's Miracle," p. 46.

139. *Zhongguo keji tongji nianjian 2009,* p. 270.

(the United States, Europe, and Japan), and are thus the most secure and most difficult to obtain. Figure 6 shows that the U.S. lead in triadic patents has increased over the last twenty years.

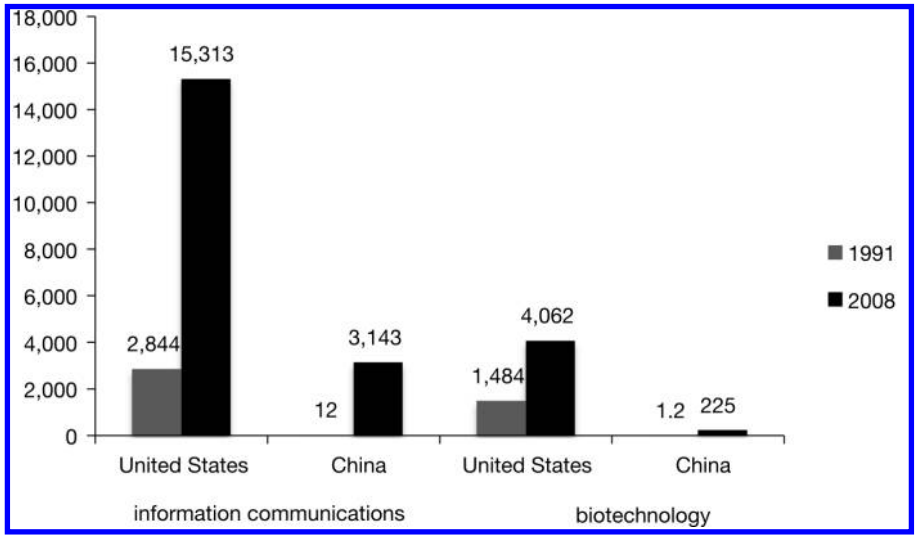
Chinese firms, moreover, do not seem to be taking genuine steps to improve their technological abilities. For the past twenty years, Chinese firms' total spending on R&D as a percentage of sales revenue has remained at levels seven times below the average for American firms.[140] Between 1995 and 2008, the share of Chinese enterprises engaged in scientific or technological activities declined from 59 percent to 37 percent, and the share of Chinese firms with an R&D department declined from 60 percent to 24 percent.[141] When Chinese firms import technology, they spend a fraction of the total cost on absorbing the technology. This fraction increased recently from 4 percent to 25 percent, but it remains far lower than the 200 to 300 percent spent by Korean and Japanese firms when they were trying to catch up to the West in the 1970s.[142]

Technological leaders sometimes rest on their laurels and abandon innovative efforts in favor of "finding new markets for old products."[143] The United States, however, looks set to excel in emerging high-technology industries. It has more nanotechnology centers than the next three nations combined (Germany, the United Kingdom, and China) and accounts for 43 percent of the world's nanotechnology patent applications (see figure 7).[144] In biotechnology, the United States accounts for 41.5 percent of patent applications (China accounts for 1.6 percent) and 76 percent of global revenues.[145] The United States accounts for 20 to 25 percent of all patent applications for renewable energy, air pollution, water pollution, and waste management technologies; China accounts for 1 to 4 percent of the patent applications in these areas (see figure 8).[146] Since 1991, the United States has increased its lead in patent applications over China in all of these industries.

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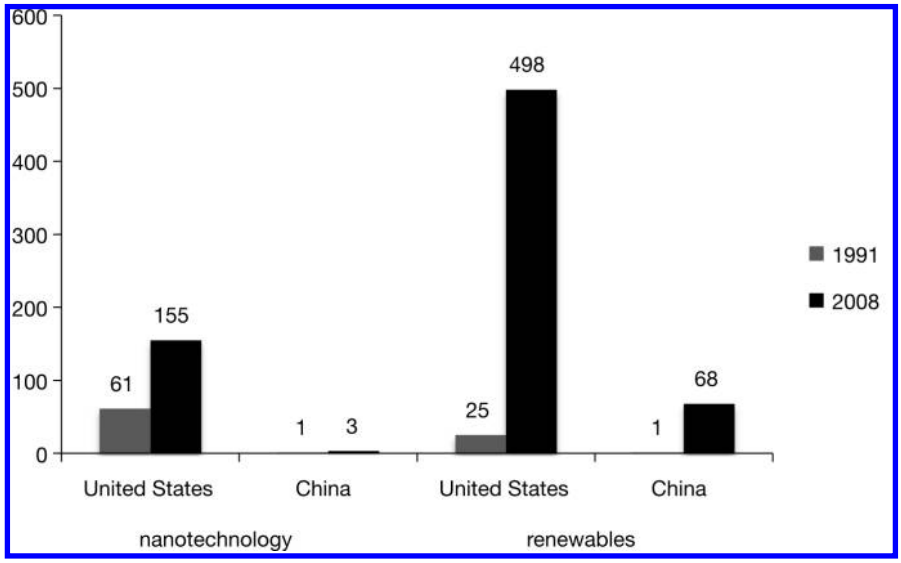
140. On Chinese firms, see *Zhongguo keji tongji nianjian 2009,* pp. 96–97. For U.S. data, see National Science Board, *Industrial Research and Development Information System, 1953–1998;* and National Science Board, *Science and Technology Indicators 2010.*
141. *Zhongguo keji tongji nianjian 2009,* pp. 94–95.
142. On Chinese firms, see ibid., pp. 94–95. On Korean and Japanese firms, see Gilboy, "The Myth Behind China's Miracle," p. 43.
143. Gilpin, *U.S. Power and the Multinational Corporation,* p. 70. See also Clayton M. Christensen, *The Innovator's Dilemma: When New Technologies Cause Great Firms to Fail* (Boston: Harvard Business School Press, 1997); and Michael Horowitz, *The Diffusion of Military Power: Causes and Consequences for International Politics* (Princeton, N.J.: Princeton University Press, 2010).
144. Zakaria, *The Post-American World,* p. 184; Organization for Economic Cooperation and Development (OECD), *OECD Science, Technology, and Industry Scoreboard 2009* (Washington, D.C.: OECD, 2010), p. 71.
145. Brigitte van Beuzekom and Anthony Arundel, *OECD Biotechnology Statistics 2009* (Paris: OECD, 2009), chap. 7.
146. *OECD Science, Technology and Industry Scorecard 2009,* p. 53.

Figure 7. Patent Applications, Information-Communication Technology, and Biotechnology Industries, 1991, 2008



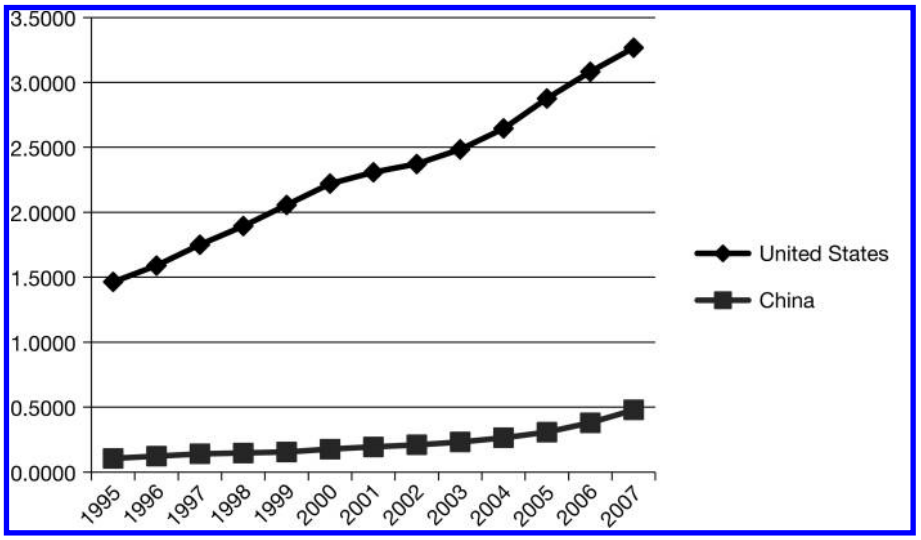
SOURCE: OECD Main Science and Technology Indicators.

Figure 8. Patent Applications, Nanotechnology, and Renewable Energy Industries, 1991, 2008



SOURCE: OECD Main Science and Technology Indicators.

Figure 9. Value Added of Knowledge-Intensive Services, 1995–2007 (current $, trillions)



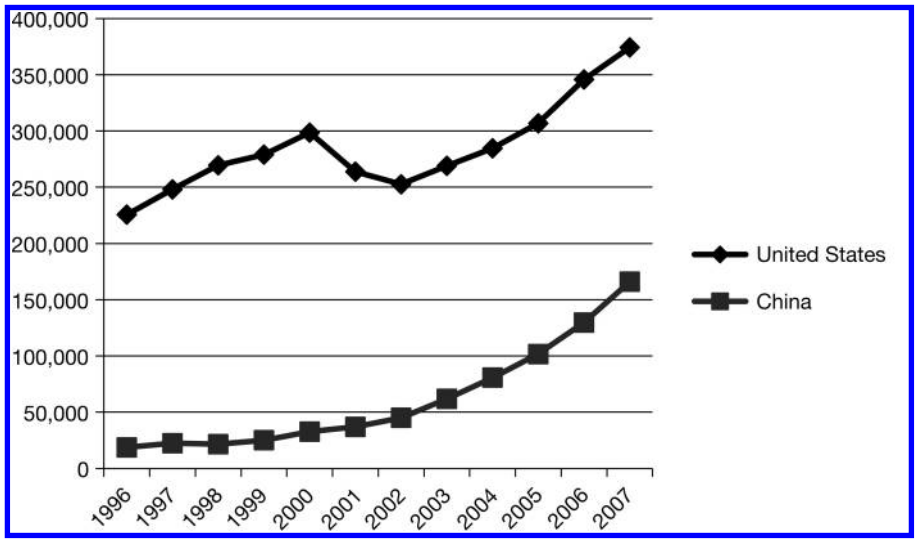
SOURCE: National Science Board, *Science and Engineering Indicators, 2010* (Arlington, Va.: National Science Foundation, 2010).

Finally, the Organization for Economic Cooperation and Development has identified ten "knowledge- and technology-intensive industries" that are capable of "altering lifestyles and the way business is conducted across a wide range of sectors."[147] The U.S. lead, in terms of value added, in knowledge- and technology-intensive manufacturing industries dipped during the 2001 recession but quickly recovered and has increased overall since 1996. Over the same time period, the United States steadily increased its lead in knowledge- and technology-intensive services (see figures 9 and 10).

In sum, a comparison of U.S. and Chinese innovation systems over the past twenty years provides strong evidence against declinism and in favor of the alternative perspective that China continues to lag behind the United States. China has increased its investments in basic science, but these efforts have yet to significantly enhance its innovative capabilities. Data on Chinese high-technology exports show that Chinese firms have increased their participation in high-technology industries. Data on commercial R&D, patents, and profits, however, suggest Chinese firms engage primarily in low-end activities, such as manufacturing and component supply. By contrast, U.S. firms seem to focus on activities in which profits and proprietary knowledge are highest, such as

147. National Science Board, *Science and Engineering Indicators 2010,* pp. 6–7.

Figure 10. Value Added of High-Technology Manufacturing, 1996–2007 (current $, billions)



SOURCE: National Science Board, *Science and Engineering Indicators, 2010* (Arlington, Va.: National Science Foundation, 2010).

product design, development, and branding. This division of labor has remained stable over the last two decades; if anything, it has become more pronounced.

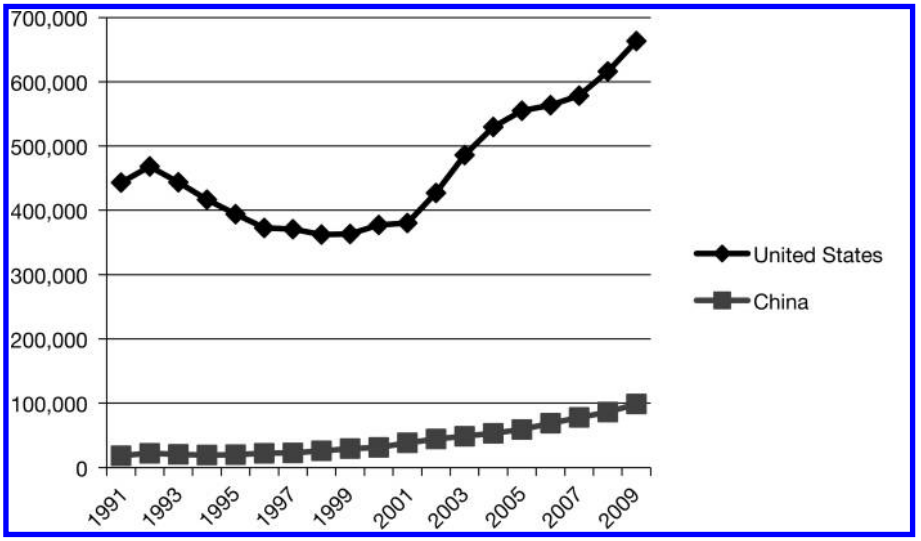
CONVENTIONAL MILITARY CAPABILITIES

China's military budget doubled from 1989 to 1994, and doubled again from 1994 to 1999, and again from 2005 to 2009. Over the last ten years, however, it has declined relative to that of the United States (see figure 11). The U.S. defense budget exceeds half a trillion dollars (eight times greater than China's and rising) even when supplemental funding for the wars in Afghanistan and Iraq is excluded. U.S. leaders will reduce the defense budget in the coming years to help address the fiscal deficits, but it is unlikely that such cuts will significantly narrow the spending gap between the United States and China.[148]

One can argue that it is unfair to compare defense budgets because America's military resources are dispersed across the globe while China's are con-

148. Michael O'Hanlon, "Defense Budgets and American Power," Policy Paper, No. 24 (Washington, D.C.: Brookings Institution, December 2010).

Figure 11. Military Spending, 1988–2009 (current $, millions)



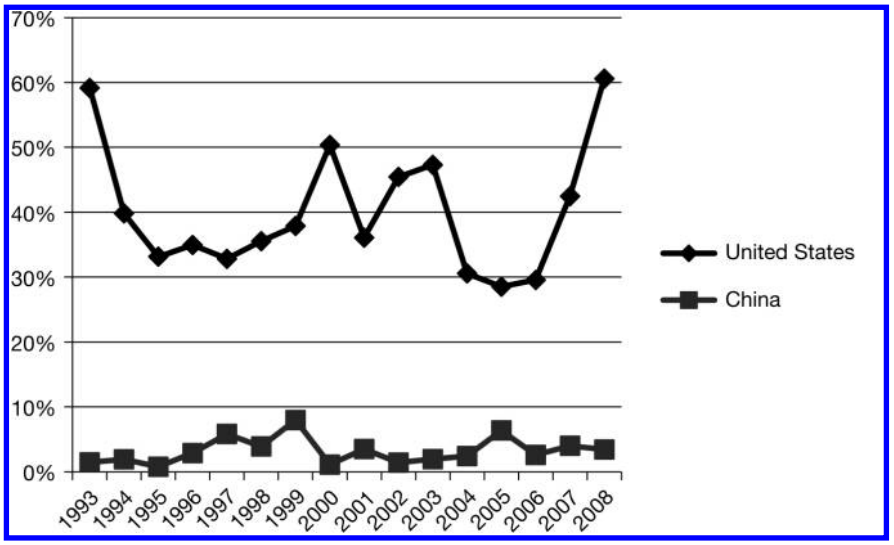
SOURCE: Stockholm International Peace Research Institute Military Expenditure Database.

centrated in Asia.[149] China, however, does not devote all, and perhaps not even a majority, of its military resources to contingencies involving the United States. China shares sea or land borders with nineteen countries, five of which fought wars against China within the last century; its northern and western borders are porous and populated by disaffected minority groups; and its government faces a constant threat of domestic rebellion. As a result, the People's Liberation Army (PLA) devotes substantial resources to internal security and requires 300,000 troops just to police China's borders.[150]

More important, the gap in defense spending likely understates the true military gap because U.S. economic superiority literally gives the United States "more bang for the buck"—each dollar it spends on the military produces more force than each dollar China spends. In a separate study, I found that developing countries systematically fail at warfare, regardless of the size of their defense budgets, because they lack the economic capacity to maintain, modernize, and integrate individual technologies into cohesive military systems.[151]

149. Dan Blumenthal, *Sino-U.S. Competition and U.S. Security: How Do We Assess the Military Balance?* (Seattle, Wash.: National Bureau of Asian Research, December 2010).
150. Robert S. Ross, "China's Naval Nationalism: Sources, Prospects, and the U.S. Response," *International Security*, Vol. 34, No. 2 (Fall 2009), pp. 55–58; and Andrew J. Nathan and Andrew Scobell, *China's Search for Security* (New York: Columbia University Press, forthcoming), chap. 11.
151. Beckley, "Economic Development and Military Effectiveness."

Figure 12. Share of World Arms Transfer Agreements, 1993–2008 (%)



SOURCES: Richard F. Grimmett, "Conventional Arms Transfers to Developing Nations, 2001–2008" (Washington, D.C.: Congressional Research Service, September 4, 2009), p. 71; and Richard F. Grimmett, "Conventional Arms Transfers to Developing Nations, 1993–2000" (Washington, D.C.: Congressional Research Service, August 16, 2001), p. 73.

Multivariate regressions suggest that military effectiveness is determined by a country's level of economic development, as measured by per capita income, even after controlling for numerous material, social, and political factors.

As noted earlier, China's per capita income has declined relative to that of the United States. China's defense industry has also fallen further behind: in 2008, the U.S. share of the world conventional arms market surged to 68 percent while China's share dropped below 1.5 percent (see figure 12). If history is any guide, this growing economic gap is also a growing military gap. The PLA may look increasingly respectable on paper, but its performance in battle against the United States would not necessarily be much better than that of, say, Iraq circa 1991. Indeed, an independent task force of more than thirty experts recently found "no evidence to support the notion that China will become a peer military competitor of the United States. . . . The military balance today and for the foreseeable future strongly favors the United States and its allies."[152]

None of this should be cause for chest-thumping. China can "pose problems

152. Carla A. Hills and Dennis C. Blair, chairs, *U.S.-China Relations: An Affirmative Agenda, A Responsible Course* (New York: Council on Foreign Relations, 2007), p. 54. See also Richard Bitzinger, "Military Modernization in the Asia-Pacific: Assessing New Capabilities," in *Strategic Asia 2010–*

without catching up," compensating for its technological and organizational inferiority by utilizing asymmetric strategies, local knowledge, and a greater willingness to bear costs.[153] In particular, some experts believe China's "anti-access/area-denial" capabilities are outpacing U.S. efforts to counter them.[154] There are reasons to doubt this claim—the Pentagon is developing sophisticated countermeasures, and Chinese writings may purposefully exaggerate PLA capabilities.[155] There is also reason to doubt the strategic importance of China's capabilities because the United States may be able to launch effective attacks from positions beyond the reach of Chinese missiles and submarines.[156] It is certainly true, however, that the U.S. military has vulnerabilities, especially in littorals and low altitudes close to enemy territory.

This has always been the case, however. From 1961 to 1968, North Vietnamese and Vietcong units brought down 1,700 U.S. helicopters and aircraft with simple antiaircraft artillery and no early warning radar.[157] Sixty years ago, China projected a huge army into Korea and killed tens of thousands of U.S. soldiers. Yes, weak adversaries can impose significant costs, but evidence of American vulnerability is not the same as evidence of American decline.

Conclusion

Change is inevitable, but it is often incremental and nonlinear. In the coming decades, China may surge out of its unimpressive condition and close the gap with the United States. Or China might continue to rise in place—steadily im-

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2011: Asia's Rising Power and America's Continued Purpose, eds., Ashley J. Tellis, Andrew Marble, and Travis Tanner (Seattle, Wash.: NBER, 2010).

153. Thomas J. Christensen, "Posing Problems without Catching Up: China's Rise and Challenges for U.S. Security Policy," *International Security,* Vol. 25, No. 4 (Spring 2001), pp. 5–40.

154. Andrew F. Krepinevich Jr., "The Pentagon's Wasting Assets," *Foreign Affairs,* Vol. 88, No. 4 (July/August 2009), pp. 18–33; Roger Cliff, Mark Burles, Michael S. Chase, Derek Eaton, and Kevin L. Pollpeter, *Entering the Dragon's Lair: Chinese Anti-access Strategies and Their Implications for the United States* (Santa Monica, Calif.: RAND, 2007); Aaron L. Friedberg and Robert S. Ross, "Here Be Dragons: Is China a Military Threat?" *National Interest,* Vol. 103 (September/October 2009), pp. 19–25; Lyle Goldstein and William Murray, "Undersea Dragons: China's Maturing Submarine Force," *International Security,* Vol. 28, No. 4 (Spring 2004), pp. 161–196; and Andrew S. Erickson and David D. Yang, "On the Verge of a Game-Changer," *U.S. Naval Institute Proceedings,* Vol. 135, No. 3 (May 2009), pp. 26–32.

155. On U.S. countermeasures, see Ronald O'Rourke, "China's Naval Modernization: Implications for U.S. Navy Capabilities—Background and Issues for Congress" (Washington, D.C.: Congressional Research Service, August 26, 2010), pp. 44–51; Sam J. Tangredi, "No Game-Changer for China," *U.S. Naval Institute Proceedings,* Vol. 136, No. 2 (February 2010), pp. 24–30; and Craig Hooper and Christopher Albon, "Get Off the Fainting Couch," *U.S. Naval Institute Proceedings,* Vol. 136, No. 4 (April 2010), pp. 42–48. On exaggerated Chinese capabilities, see Erickson and Yang, "On the Verge of a Game-Changer," p. 30.

156. Friedberg and Ross, "Here Be Dragons," pp. 25–35.

157. Kenneth P. Werrell, *Archie, Flak, AAA, and SAM: A Short Operational History of Ground-Based Air Defense* (Maxwell Air Force Base, Ala.: Air University Press, 1988), p. 112.

proving its capabilities in absolute terms while stagnating, or even declining, relative to the United States. At the time of this writing, the United States remains mired in the worst economic crisis since the Great Depression and carries the largest debt in its history. Moreover, the recent partisan standoff over raising the debt ceiling suggests the American political system is losing the capacity for compromise on basic issues, let alone on large-scale problems. It is impossible to say whether the current malaise is the beginning of the end of the unipolar era or simply an aberration. The best that can be done is to make plans for the future on the basis of long-term trends; and the trends suggest that the United States' economic, technological, and military lead over China will be an enduring feature of international relations, not a passing moment in time, but a deeply embedded condition that will persist well into this century.

In recent years, scholars' main message to policymakers has been to prepare for the rise of China and the end of unipolarity. This conclusion is probably wrong, but it is not necessarily bad for Americans to believe it is true. Fear can be harnessed in the service of virtuous policies. Fear of the Soviet Union spurred the construction of the interstate highway system. Perhaps unjustified fears about the decline of the United States and the rise of China can similarly be used in good cause. What could go wrong?

One danger is that declinism could prompt trade conflicts and immigration restrictions. The results of this study suggest that the United States benefits immensely from the free flow of goods, services, and people around the globe; this is what allows American corporations to specialize in high-value activities, exploit innovations created elsewhere, and lure the brightest minds to the United States, all while reducing the price of goods for U.S. consumers. Characterizing China's export expansion as a loss for the United States is not just bad economics; it blazes a trail for jingoistic and protectionist policies. It would be tragically ironic if Americans reacted to false prophecies of decline by cutting themselves off from a potentially vital source of American power.

Another danger is that declinism may impair foreign policy decision-making. If top government officials come to believe that China is overtaking the United States, they are likely to react in one of two ways, both of which are potentially disastrous.

The first is that policymakers may imagine the United States faces a closing "window of opportunity" and should take action "while it still enjoys preponderance and not wait until the diffusion of power has already made international politics more competitive and unpredictable."[158] This belief may spur

158. Charles A. Kupchan, "Hollow Hegemony or Stable Multipolarity?" in G. John Ikenberry, ed., *America Unrivaled: The Future of the Balance of Power* (Ithaca, N.Y.: Cornell University Press, 2002), p. 68.

positive action, but it also invites parochial thinking, reckless behavior, and preventive war.[159] As Robert Gilpin and others have shown, "[H]egemonic struggles have most frequently been triggered by fears of ultimate decline and the perceived erosion of power."[160] By fanning such fears, declinists may inadvertently promote the type of violent overreaction that they seek to prevent.

The other potential reaction is retrenchment—the divestment of all foreign policy obligations save those linked to vital interests, defined in a narrow and national manner. Advocates of retrenchment assume, or hope, that the world will sort itself out on its own; that whatever replaces American hegemony, whether it be a return to balance of power politics or a transition to a post-power paradise, will naturally maintain international order and prosperity.

Order and prosperity, however, are unnatural. They can never be presumed. When achieved, they are the result of determined action by powerful actors and, in particular, by the most powerful actor, which is, and will be for some time, the United States. Arms buildups, insecure sea-lanes, and closed markets are only the most obvious risks of U.S. retrenchment. Less obvious are transnational problems, such as global warming, water scarcity, and disease, which may fester without a leader to rally collective action.

Hegemony, of course, carries its own risks and costs. In particular, America's global military presence might tempt policymakers to use force when they should choose diplomacy or inaction. If the United States abuses its power, however, it is not because it is too engaged with the world, but because its engagement lacks strategic vision. The solution is better strategy, not retrenchment.

The first step toward sound strategy is to recognize that the status quo for the United States is pretty good: it does not face a hegemonic rival, and the trends favor continued U.S. dominance. The overarching goal of American foreign policy should be to preserve this state of affairs. Declinists claim the United States should "adopt a neomercantilist international economic policy" and "disengage from current alliance commitments in East Asia and Europe."[161] But the fact that the United States rose relative to China while propping up the world economy and maintaining a hegemonic presence abroad casts doubt on the wisdom of such calls for radical policy change.

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159. Jack S. Levy, "Declining Power and the Preventive Motive for War," *World Politics,* Vol. 40, No. 1 (October 1987), pp. 82–107.
160. Gilpin, *War and Change in World Politics,* p. 239. See also Dale Copeland, *Origins of Major War* (Ithaca, N.Y.: Cornell University Press, 2000); and Charles Doran and Wes Parsons, "War and the Cycle of Relative Power," *American Political Science Review,* Vol. 74, No. 4 (December 1980), pp. 947–965.
161. Layne, "From Preponderance to Offshore Balancing," pp. 87, 118.