NEW PERSPECTIVES in foreign policy

A JOURNAL WRITTEN BY AND FOR THE ENRICHMENT OF YOUNG PROFESSIONALS

SPRING 2017 | ISSUE 12

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Is Shale Development Possible in Russia?

Suzanne Freeman

Introduction

RUSSIA HAS GREAT SHALE OIL AND GAS POTENTIAL, which along with greenfields and offshore development, represent a potential source for future production. In 2013, the U.S. Energy Information Administration’s global shale rankings named Russia first in shale oil reserves and ninth in shale gas reserves. However, there are significant obstacles to Russian shale development. Many assume the major obstacle is technology, but this article will posit that the major obstacle is Russia’s business climate and industry structure.

Shale projects require two main technologies to bring trapped oil and gas to the surface: horizontal drilling and hydraulic fracturing. The transfer of advanced technologies for shale is specifically prohibited by U.S. and E.U. sanctions against Russia. There are projects in Russia that are already horizontally drilled and fracked, showing that Russian companies already have some of this technology. However, in 2013 the estimated 10,000–11,000 barrels per day (bpd) of shale oil produced represents just a fraction of the total 10.508 million bpd of oil Russia produced. For example, Surgutneftegaz has been trying to produce shale oil from the Bazhenov shale, Russia’s largest shale deposit, for decades, but faces difficulty partly due to Bazhenov’s complex geology. In 2013, before sanctions, with Western assistance in joint ventures (JVs) like GazpromNeft-Shell and Lukoil-Total, production was perpetually a few years away. Moreover, these JVs were formed in a climate of high prices. Today, companies like GazpromNeft and Lukoil have the technology to continue these projects independently, but they will need to find import substitutes for certain parts of drilling and other equipment. GazpromNeft’s Bazhenov production outlook for 2023 remains modest at 40,000 bpd.

Even before Western sanctions, shale development in Russia struggled. One reason may be that Russia lacks a business climate and industry structure favorable to shale development.

Business climate factors for U.S. shale

Business climate in the United States was key to shale development. First, the United States has many independent producers of various sizes that compete with each other for resources and capital. These companies must innovate to make money in a competitive market. Companies also...
specialize in one aspect of the oil and gas value chain, like exploration and production (E&P) or refining, because not every company can be or wants to be vertically integrated like a large international oil company (IOC). Second, the United States has competitive oil and gas service companies that effectively allow drilling and other oilfield work to be outsourced and allow the price of services to change with the oil price and profitability.

The first and second factors are related: the United States has both integrated and specialized oil and gas companies, which allow companies with different motivations to work in the market. An IOC is trying to maximize profits across all of its businesses, so when production is down, refining can still yield profit. A specialized E&P company must focus on profiting from new upstream projects. Third, the U.S. oil and gas industry has easy access to capital. Investors in the United States will invest as long as they can make money, and the industry is known for wildcatters. Moreover, U.S. shale development was stimulated by a period of high prices. Together these three factors allowed agile specialized E&P companies like XTO to get funding and outsource drilling to service companies to accomplish projects, which may not have been as attractive to IOC-size companies.

The business climate for shale doesn’t exist in Russia

None of these three factors are present in Russia. Russia has few independent producers, which are generally smaller and have uncertain property rights, and no competitive service companies. Russia’s oil and gas companies are integrated and often state-owned. Even Russia’s large “independent” companies, like Novatek and Lukoil, are partially state controlled or at least subject to state pressure. State ownership gives companies privileges that push out market competition and confer preferential access to licenses for the best projects. For example, Gazprom enjoys a gas export pipeline monopoly, forcing all other companies, including Rosneft, to sell to the domestic market at a lower price and even worse flare gas associated with oil production. This cushion of state control also creates a degree of corruption and mismanagement, which means that investment budgets can be misspent.

Shale projects can be high risk, because while geological surveys for a known area like Western Siberia are present, lengthy exploratory drilling is often required prior to production. A project in Eastern Siberia would be doubly risky because there wouldn’t be the same level of geological information. Another risk is the instability of rule of law and fiscal terms in Russia, because the government has a history of taking assets from private companies and giving them to state-owned companies. A smaller Russian company, rather than a large government-backed company, would take on more risk investing in a shale project due to concerns over rule of law, and is therefore unlikely to
invest. Shale projects can also be high cost: a 2013 Ernst & Young estimate put general costs at between $50 and $100 per barrel. For Russian state companies, these exploratory and cost risks are compounded by problems associated with state ownership. The survivability of Rosneft and Gazprom depends on positive patronage relations with the Russian government as they are under pressure to provide revenue for 40 to 50 percent of the state budget.

State-owned companies can also be pushed into serving geopolitical rather than market-oriented goals. So, while Russia needs new oil and gas resources, because brownfield production is declining, Gazprom is encouraged instead to build the Power of Siberia pipeline and Nord Stream 2 pipeline. The Power of Siberia pipeline, involving China, serves to prove that Russia can find alternative investment and operate without the West, while Nord Stream 2 will allow Russia to circumvent Ukraine and increase gas exports to Europe. Moreover, the government tax regime takes a large cut of oil and gas company proceeds, which de-incentivizes shale projects from the company profit point of view, and exploration in general when prices are low. The tax rate is higher when the price of oil is higher, so on the one hand producers feel price fluctuations less, but they are also less likely to engage in costly exploration or production.

Finally, Russian companies lack easy access to capital. Russia is currently in a recession due to low oil prices and Western sanctions, and the ruble has devalued by half since 2013. Russian companies will need capital to invest in the front end of shale projects. Although ruble-denominated projects have become cheaper overall, it may appear safer to these companies to invest in conventional greenfield projects and new offshore projects or increase production at brownfield projects through enhanced recovery techniques. Moreover, the allocation of capital for investment that does occur doesn’t prioritize shale projects, but focuses on new greenfield and offshore projects instead.

Conclusion: Is there a way forward for Russia?

Without a business climate or industry structure favorable to shale development in the private sector, Russian shale development would only occur in specific circumstances.

One scenario is shear political will. Without regulatory, capital, or company structural changes, increased shale development could occur as a top-down
mandate. Shale development was once called a myth by Gazprom CEO Alexei Miller and has been largely a U.S. activity. For this reason, the Russian government could push for wide-scale shale development to prove that it can be done in Russia.

The Russian government could also reform the business climate directly by easing regulations. The government could decrease the taxation rate or allow more producers to export natural gas by breaking export pipeline monopolies. This is the most likely path as Russia provided tax incentives for shale development in the past, as in 2013, and Rosneft has repeatedly challenged Gazprom’s pipeline monopoly in court.

Another possibility is non-Western foreign investment. Rosneft made deals with India’s ONGC Videsh in 2016 and Novatek has secured both Chinese and Japanese investment for Yamal LNG. But companies from these countries have yet to invest in shale projects. The OPEC deal and Donald Trump’s election as U.S. president may also represent opportunities for increased foreign direct investment in Russia as the price of oil may rise and sanctions on Russia may soften.

Without serious changes to the regulatory environment, industry structure, or capital access, major shale development in Russia is unlikely to occur.

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IS SHALE DEVELOPMENT POSSIBLE IN RUSSIA?


10. Aron, “The political economy of Russian oil and gas.”

11. There is a profit tax, value-added tax, mineral extraction tax, and asset tax, as well as charges for the use of subsoil resources, mandatory contribution to social funds, and export duties.


Responsible Partnership: Moving Beyond Siloed Corporate Social Responsibility

IF WALMART WERE A COUNTRY, its revenue would make it the 25th-largest economy on the planet—and it is only one of 13 multinational companies (MNCs) whose 2016 revenues would place them among the world’s top 50 economies by this same metric.1 This figure not only highlights the incredible wealth of resources and skills that exist within the private sector, but the potential influence they might have when they turn their attention to improving the world. Through enhanced corporate social responsibility programs (CSR), an increasing number of MNCs are making this commitment a key part of their business models. Based on the premise that corporations must address and offset the negative environmental and humanitarian implications of their work—and the reality that they often benefit from doing so—CSR represents a powerful tool for reaching people that may not be served (or remain underserved) by traditional, government-sponsored social safety nets. However, the tendency to fixate on branding, ownership, and immediate returns prevents innovative, cross-industry cooperation. Partnerships that blend several MNCs’ comparative strengths would break the stale CSR mold, but may require government support to get off the ground.

CSR has existed in some shape since the industrial revolution, with factories and farms at the forefront of the movement toward socially responsible corporations.2 Today, CSR programs exist in a wide variety of forms, providing training, access to finance, or other services to those in need. They generally seek three main outcomes: the immediate humanitarian or philanthropic impact of improving lives and livelihoods; the longer-term revenue benefits of a happy and successful workforce; and the effect of good (and well-publicized) business practices on consumer choice.3 Modern-day CSR programs often focus on giving back to the community, creating sustainable supply chains, addressing environmental or social crises, and raising money or awareness for charitable causes.

Historically, manufacturers and traditional service providers have dominated the CSR scene. As digital service providers have emerged—including industry giants like Google, Facebook, and Salesforce—they have learned from the best practices developed by these forebears. Indeed, many have been created with comparable CSR principles woven into their business models, even though their industry
RESPONSIBLE PARTNERSHIP: MOVING BEYOND SILOED CORPORATE SOCIAL RESPONSIBILITY

confronts very different environmental and labor constraints from those that manufacturers face.

However, because of these differences in their activities and capabilities, CSR at tech companies (“tech-CSR”) and at manufacturers or service providers (“goods-CSR”) look different in practice. Goods-CSR often has immediate social and environmental “bads” to offset. Factories generally require land, an energy source, employees, and raw materials; how these are sourced, treated, or trained have important implications for local populations. Partly as a result, goods-CSR typically focuses on sharing benefits or mitigating the negative consequences of core corporate activities on those effected.

Digital service providers do not directly interact with the usual beneficiaries of CSR programs in the same way that manufacturers do. By contrast, tech-CSR is often inherently proactive, looking for problems to solve and opportunities to build a strong brand and relations with consumers, while goods-CSR is often reactive to environmental or social issues that are direct results of production activities. Rather than leveraging large workforces or traditional physical infrastructure (e.g., factories), tech-CSR also tends to make use of the tech service industry’s strengths—especially data collection and analytics—in order to monitor, graph, map, and project when and where needs will arise. Even at tech companies with strong input-focused CSR programs, such as Salesforce, the bulk of the organization’s CSR efforts usually focus on data, sharing tech-related skills, and grants and donations.

Partnership between these two styles of CSR would create a formidable engine for good. Combining tech-CSR’s data analytics with goods-CSR’s distribution networks and products could create a more efficient, targeted generation of CSR programming. By relying on each industry to provide the part of the partnership that suits their strengths—data or goods, respectively—partnered CSR programs have the potential to outpace and outperform non-partnered initiatives, ultimately saving time and effort for the corporation, while generating greater impact for local beneficiaries.

To date, there are few examples of this kind of collaborative CSR program, but the track record of similarly designed public-private partnerships (PPPs) illustrates their potential. For example, the San Francisco Citizens Initiative for Technology (sf.citi) is an advocacy group that encourages partnership between San Francisco-based tech companies and local public schools. By donating the local tech industry’s knowledge and time with students, sf.citi cultivates the next generation of technology experts and simultaneously improves the quality of public education. PPPs like this could be expanded or adapted to apply the tech industry’s data and analysis skills to backlogged or outdated government records.
In a similar PPP, Google lent their impressive mapping and tracking software to the United Nations in order to assist with recovery efforts after the Haiti earthquake in 2010. In addition, Google donated $1 million to nongovernmental organizations (NGOs) that worked on the island to provide supplies and medical treatment to those affected by the earthquake (through the UN International Children’s Emergency Fund, UNICEF; CARE; Doctors Without Borders; and others). However, cooperation with shipping company DHL might have been more cost-effective than a donation. DHL provided logistical support for incoming goods to Port au Prince, and access to Google’s mapping software might have improved their ability to direct goods to areas of greatest need.

That there are few examples of purely private tech-manufacturing CSR partnerships does reflect some of the challenges inherent in these kinds of collaboration. One of the most important barriers to successful CSR partnership is branding, as the marketing value of many CSR projects is often seen as their major benefit. The business case for CSR in general can be hard to define for internal stakeholders as well as shareholders, and MNCs may be unwilling to share credit from consumers. Another challenge is the potential competitiveness implications of cooperation. MNCs are often protective of their business practices, which can hinder partnership and cooperation even on CSR projects not directly related to product creation.

These barriers are unlikely to disappear anytime soon, but overcoming them is well worth the effort. Together, the planet’s largest 50-largest MNCs employ over 116 million people in the “hidden workforce” of their supply chains. This gives them tremendous influence, and highlights both the moral imperative for efficient CSR and its critical financial importance. Particularly at a time of slowing global growth, these companies must take ownership over their supply chains in order to ensure the success and sustainability of their business models, which rely heavily on integrated cross-border production networks. While there are both local and international NGOs that work to create opportunities for CSR partnership, such as Mahiti in India or World Vision or CollaborateUp that work internationally, the onus is still on the MNCs to begin the process.
However, there may also be a role for the public sector to help. The U.S. government in particular has the potential to support CSR activities and create incentives that can drive partnership through decreasing coordination costs, identifying needs that CSR might serve, and shifting incentives to favor more responsible business conduct. A web platform, for example, that lists successful CSR initiatives by U.S.-based companies would give consumers more information about how they can support socially responsible businesses and enable socially conscious CEOs to learn about CSR programs that could augment their own. In times of particular need, such a platform would create a simple way for a city or country in need to identify which programs might be best suited to help. Creating a seal of approval or award system that successful partnerships could use in their marketing and branding campaigns could encourage further partnership—and spur competition among partnerships for the most efficient, effective programs.

As the private sector continues to grow and evolve and demands for transparency and ethical consumption grow, it is likely that CSR programs will continue to expand. Improving the efficiency of CSR programs through partnership is thus an issue of significant importance, and represents a major opportunity for MNCs to do well for themselves by doing good for the world.

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1 Vincent Trivett, “25 US Mega Corporations: Where They Rank If They Were Countries,” Business Insider, June 27, 2011, http://www.businessinsider.com/25-corporations-bigger-than-countries-2011-6. While it is important to note that revenue and GDP are not the same (the latter is calculated on the basis of value-added, among other differences), revenue is here used as a proxy for corporate size.


8 In an interesting case, Amazon, whose business model blends the challenges and capabilities of both goods- and tech-based companies, has yet to figure out a CSR strategy that blends its tech capabilities with its labor and environmental needs. For more on this, see John Dudovskiy, “Amazon Corporate Social Responsibility,” Research Methodology, February 7, 2016, http://research-methodology.net/amazon-corporate-social-responsibility/.


Russian-Iranian cooperation is seemingly on the rise. Is it true love, or a fleeting romance of convenience? When examining the relationship, many analysts overlook the long history of Russian-Iranian interaction. Moreover, the debate tends to focus on Russia's strategic goals and Iran's place within these goals, while many take for granted Iran's view of Russia as a desirable “alternative” to the West. Iran's historical experience of Russia is colored by violence, foreign interference, and clashing worldviews. This does not doom future Russian-Iranian cooperation, but the extent to which Iranians continue to feel slighted may put natural limitations on the partnership. Three phrases embedded in Iran's collective memory through the Persian language highlight how difficult it might be to reinvent Russo-Iranian relations.

1. ostan az dast dam ("provinces we lost," or more literally, "provinces taken from our hand")

This phrase references imperial Russia's annexation of the South Caucasus region, which had been part of Iran as early as the Achaemenids in the fifth century BC. Following the first Russo-Persian War (1804–1813), the Treaty of Gulistan formalized Russia's annexation of Georgia and forced Persia to cede Daghestan and most of present-day Azerbaijan. Qajar Iran was again defeated in the second Russo-Persian War (1826–1828). The ensuing Treaty of Turkmenchay extended Russian control into Armenia and gave Russia exclusive trading rights in the Caspian Sea. To Iranians, the loss of the Caucasus was a national trauma. It undercut the idea of "Iran" as a unified, multiethnic polity and solidified notions of an empire in decline. Public resentment toward Russia reached a boiling point after Turkmenchay: in 1829, a mob stormed the Russian embassy in Tehran and lynched the Russian ambassador Alexander Griboyedov. Iranians still regard these treaties as a humiliating low point of their national history, and ostan az dast dam has become a metaphor for more generalized appropriation and loss.
Against the backdrop of this history, Russia’s intervention in Syria, while in line with Iran’s own strategic goals, says little about Russia’s commitment to a partnership with Iran.

with 50,000 Russian soldiers. Throughout the nineteenth century, Russia and England competed for influence in Iran, and in 1907 they divided Iran into zones of influence. Russian troops backed Muhammad Ali Shah’s coup to reverse popular constitutional reforms in 1909, revealing Russia’s hostility toward Iranian sovereignty. Throughout World War II, Soviet forces occupied parts of Iranian Azerbaijan, earning a reputation for being “beasts” that persists today. 2 The Soviet Union’s 1979 invasion of Afghanistan was yet further proof of Russians’ seemingly unending willingness to invade the Middle East to achieve their strategic goals. 3

3. na sharq, na gharb, jomhuri-e islami (“Neither East, nor West, Islamic Republic”)

Engraved in blue tile over the entrance to Iran’s Ministry of Foreign Affairs, this slogan states the Islamic Republic’s ideological independence from both the cold materialism of the West and the totalitarian bents of the East. The slogan still reverberates in Iran as a metaphor for “independence” and “self-sufficiency,” ideas that continue to guide Iranian foreign policy thinking. Pursuit of nuclear power makes sense in light of Iran’s longstanding anti-colonial struggle to control its own resources. 4 Self-sufficiency is a matter of national pride.

Old dog, old tricks

Against the backdrop of this history, Russia’s intervention in Syria, while in line with Iran’s own strategic goals, says little about Russia’s commitment to a partnership with Iran. Indeed, Russia’s use of an Iranian air base in August, what some analysts dubbed an extraordinary sign of a new strategic axis, also demonstrated Iran’s continued distrust of Russia. The decision, intended to be secret, was trumpeted by Russian state television as a sign of Russia’s resurgent influence. This prompted Iran to terminate the agreement and parliament member Heshmatollah Falahatpisheh to warn that Russia has a “turbulent foreign policy”
and its own “strategic and foreign policy considerations.” Iranian General Hossein Dehghan called Russia’s behavior “ungentlemanly” and “a betrayal of trust.”

Iranian distrust of Russia also spills into the economic sphere. Russia and Iran have penned large bilateral energy and investment deals, but trade between the two remains low relative to total trade. And from Iran’s perspective, Russia has a history of breaking promises. Russia’s delay in constructing the Bushehr nuclear reactor was viewed by Iran as a “politicization” of the issue. Construction on the plant resumed in 2007, but in 2010 Russia walked back on its agreement to supply Iran with S-300 missiles, prompting Iran to sue Russia in international court. Missile delivery resumed following the Joint Comprehensive Plan of Action (JCPOA). Nevertheless, these incidents demonstrated to Iran once again that Russia is a friend only when it is convenient.

“Death to Russia” chants broke out at the funeral of former president Akbar Hashemi Rafsanjani, in what is the latest reminder of Iran’s complicated history with Russia. Recent military and economic cooperation indicates that Russia and Iran’s professed desire to improve ties is not just rhetorical. But tactical alignment will not undo centuries of invasion and violent intervention—a history that remains present in Iran’s collective consciousness. As Iran’s former ambassador to France remarked in 2012, “there is a national distrust in Iranians’ nature against Russia.” A durable strategic partnership speaks to a common worldview or a unifying ideology that is deeper than tactics. Despite their shared opposition to perceived U.S. hegemony and Western systems of governance, this is something Russia and Iran lack. Russia views itself as a resurgent empire, but Putin’s promise to restore Russian glory sounds less romantic to Iranians, whose lives and sovereignty were historically the price of this glory. History will continue to exert a force on Russian-Iranian relations.

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2 Indeed, former president Rafsanjani noted in 2012 that “The Soviet Union’s record on invading Afghanistan left a bad memory of Russians in Iranians’ minds. It is too often overlooked that the Islamic Republic’s relationship with Russia was formed in such an environment.” Iran-Russia Studies Institution, “In Exclusive Talk with Ayatollah Hashemi Rafsanjani: ‘The Existent Shape of Iran-Russia Relations Has Not Been Based on Iran’s Strategic Choice’ (First Part),” January 29, 2012, https://web.archive.org/web/20120210093251/http://www.iraneurasia.ir/fa/pages/?cid=20435.


OVER THE LAST YEARS OF HIS ADMINISTRATION, President Obama and the Department of Defense (DoD) emphasized a “pivot” or “rebalance” strategy to Asia in response to the military rise of China and increasing tensions in the Asia-Pacific region. The growing complexity of the Asia-Pacific, including conflict over the South China Sea and other maritime disputes, has demanded increased naval presence from the United States. In response, the U.S. Navy has been strengthening its capacity and working with its allies in Asia to address potential challenges in the waters and across the region. However, there are concerns that today’s U.S. Navy is too small to meet these geostrategic challenges. For example, Donald Trump repeatedly called for a 350-ship Navy throughout his presidential campaign, while then-secretary of the navy Ray Mabus called for a 355-ship requirement in the Navy’s “2016 Force Structure Assessment.” Given the importance of the rebalance to Asia and as China continues to expand its military capabilities, the United States must respond accordingly and build up its own fleet, in particular, its nuclear-powered attack submarine (SSN) force.

Attack submarines in particular are vital to naval success, as they can perform a variety of missions, both in peacetime and at war. SSNs can be used for intelligence, surveillance, and reconnaissance (ISR) for national and Navy-specific purposes, can engage in covert insertion and recovery of special operations forces, and can conduct covert strikes with Tomahawk cruise missiles.1 In a modern world where SSNs provide considerable asymmetric advantages, SSNs are one of the Navy’s best bets for countering Chinese naval forces.

Recognizing the asymmetric advantage of U.S. SSNs, the Chinese People’s Liberation Army Navy (PLAN) has prioritized increasing both the capacity and capabilities of its own submarine force in recent years. According to DoD’s public estimates, Chinese investments will result in a PLAN submarine force that may grow to between 69 and 78 submarines by 2020.2 As the PLAN submarine fleet grows, it does by replacing older, aging boats with more modern, improved variants. For example, the PLAN’s latest SSN, the SHANG-class (Type 093), represents a significant advance over previous generations, featuring a vertical launch system capable of firing anti-ship cruise missiles. Additionally, there is speculation that the Chinese will begin production of an even-newer class of SSNs (Type 095)
sometime in the next 10 years. While the Chinese submarine force remains technically inferior to that of the United States, recent Chinese investments have considerably shrunk the gap. Without continued U.S. investment, the United States risks wagering that Chinese submarine forces will not catch up and surpass U.S. SSN forces in the Asia-Pacific.

As the PLAN has made significant investments in its own submarine force, under current plans, the U.S. Navy is expected to experience an SSN shortfall from 2025–2036 as Los Angeles-class submarines reach the end of their service life. In May 2016, the U.S. Navy released the Submarine Unified Build Strategy (SUBS) outlining its plan for submarine production through 2023. Specifically, the strategy coordinates the building of Virginia-class submarines with the Columbia-class submarines set to replace the Ohio-class ballistic missile submarines (SSBNs) in the coming years. Under the SUBS plan, the Navy is set to build only two total submarines per year—either two Virginia-class SSNs, or one Virginia-class SSN and one Columbia-class SSBN. At such a rate, it would take decades for the Navy to even meet the former 48 SSN requirement, resulting in an SSN requirement-production gap. Since the SUBS release in May 2016, the Navy’s updated “Force Structure Assessment” increased the SSN requirement from 48 to 66 SSNs, only further increasing the requirement-production gap. Given the growing threat of Chinese submarine capabilities, it is critical that the United States undertake significant efforts to address the SSN requirement-production gap.

Addressing the SSN requirement-production gap cannot be done piecemeal by any singular organization, instead requiring a partnership among the Navy, Congress, industry, and the Trump administration. Addressing the SSN requirement-production gap cannot be done piecemeal by any singular organization, instead requiring a partnership among the Navy, Congress, industry, and the Trump administration. Meeting the 66 SSN requirement likely requires several concurrent efforts that include, but are not limited to, extending the service life of existing SSNs where possible, reducing SSN production timelines, and increasing yearly SSN production rates. While individual organizations can unilaterally undertake minor actions at solving these actions, such actions are insufficient for truly addressing the larger issue. Only by working in a partnership will the United States actually solve the SSN requirement-production gap.
Increasing yearly submarine production highlights the necessity of this type of partnership. Industry officials have indicated that if called upon, the industry can meet increased yearly SSN production requirements, but would need to increase the size of the workforce and make investments to expand the supply base. Before making these investments, industry needs some confidence that they can recoup the cost of these investments, which will occur only if submarine production is increased for several years. However, the 2011 Budget Control Act (BCA) defense budget caps that remain in place until fiscal year 2021 significantly hamper these investments. While the 2011 BCA budget caps have been raised each year in place to date, there’s no guarantee this continues into the future. Without certainty that the defense budget caps will continue to be raised, industry will be hesitant to make the necessary investments just in case the budget caps do get enforced. By repealing the 2011 BCA caps, Congress can provide industry with the increased certainty necessary for making these investments.

The United States currently has the strongest naval fleet in the world and maintains a significant competitive undersea advantage, with submarines providing both defensive and offensive capabilities. Without a firm commitment to sustaining U.S. naval capabilities at a crucial time when the Chinese are revitalizing their own, our maritime advantage in Asia may slip away. Only by working in a partnership among the Navy, Congress, industry, and the Trump administration can the United States ensure continued undersea dominance.

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“Ibid.”


When internet users send a Facebook message, order a package on Amazon, or pay a gas bill, they put their faith in a near-ubiquitous Internet security system that protects their data from interception and abuse. All sensitive Internet traffic is protected by this system, called public-key encryption. Public-key encryption scrambles communications, rendering them useless to an eavesdropper, while allowing for legitimate parties to interface seamlessly with Internet services they want to access. It is the system behind the padlock icons seen next to the Web address on most browsers, and like those icons, public-key encryption has up to this point been taken for granted.

The importance of encrypted communications is hard to overstate. We trust that we can shop, communicate with friends, and conduct all manner of business online because we perceive the Internet to have a certain integrity: we believe that the data exchanged between our devices and the servers of Facebook, Amazon, or Bank of America is private. It is public-key encryption that ensures this. It is impossible to imagine the Internet without it. If any nefarious actor could intercept traffic, record sensitive data, or pose as a legitimate party in an online communication, the Internet would be limited to its most basic utilities. It is no surprise, then, that public-key encryption has been around since 1973.

At its core, public-key encryption is based on the simple but impregnable math problem of factoring giant prime numbers. The limitations of modern computing mean that solving a standard encryption cipher, even with hundreds of computers working in concert, would take thousands of years.1

Today’s “classical” computers represent information with tiny circuits called bits. By changing the voltage through the circuit, the bit’s value can be made 1 or 0. Groups of bits encode numbers, letters, or logical operations. These days, defeating public-key encryption is only slightly more systematic than trial-and-error. Classical computers must flip billions of bits from 1 to 0 and back, sifting through endless sets of factors, as if trying keys in a lock.2

The same problem could, theoretically, be cracked in far less time by a more powerful device that scientists around the world are painstakingly piecing together: the quantum computer. Quantum computers’ design is uniquely advantageous for deciphering problems like public-key encryption.
Quantum computers achieve this remarkable speedup by relying on the peculiar characteristics of subatomic particles. Certain tiny particles can act as quantum bits, or qubits. The advantage of qubits is that instead of being either 1 or 0, they can also hold a probabilistic combination of both values. This means that for the same number of bits, qubits represent exponentially more information. To describe a 30-qubit system, for instance, requires 1.1 billion pieces of information.

In 1994, mathematician Peter Shor came up with a way to harness this power to deconstruct, and solve, the problem of breaking public-key encryption. Where classical computers try one front door key at a time, a quantum computer equipped with Shor’s Algorithm can quickly narrow the huge set of keys down to the few that will open the door with highest probability.³

Shor’s Algorithm is a theoretical construct: a quantum computer capable of executing it is far off. Experts are divided on the exact date, but the engineering challenges are such that true quantum computers are at least a decade away. Michele Mosca, one of the best-known quantum researchers in the world, thinks we have a one-in-seven chance of seeing a functional quantum computer by 2026, and a one-in-two chance by 2031.⁴

So it will be some time before a quantum computer can actually expose information communicated over the Internet. But the old adage about an ounce of prevention rings true for Internet security, as well. The possible fallout, should a quantum computer be operated before our systems are secured against its capabilities, is unimaginable. To complicate matters, the National Institute of Standards and Technology (NIST),⁵ estimates that “it has taken almost 20 years to deploy our modern public key cryptography infrastructure.”⁶ An effective revamp of our online security, fully deployed by the time quantum computing is realized, must start now.

Currently, there are researchers worldwide making significant process on security systems impenetrable even by quantum computers. In August 2016, NIST announced a call for proposed quantum-resistant cryptographic algorithms—math problems hard enough to give even quantum computers a run for their money.⁷ The EU has had a similarly focused research project called PQCRYPTO (post-quantum cryptography) running since April 2015. Even Google piloted a potentially quantum-resistant algorithm called “New Hope” in a small fraction of Chrome browsers as recently as July.⁹
Some security researchers have explored deploying security systems themselves based on quantum science, encoding communications directly onto quantum particles. A fundamental rule of quantum physics is that the observation of a quantum particle disturbs it (and thus alters any information it could convey) in a measurable way. An eavesdropper intercepting quantum-encoded messages between two parties would immediately corrupt the message and reveal their presence. The concept may sound far-fetched, but such systems are already commercially available: Geneva used a quantum system to secure election results as far back as 2007; Los Alamos National Labs revealed in 2013 that it had been running a “quantum Internet” for over two years; and in August 2016 China launched a satellite capable of quantum-secure communication. ¹⁰

These breakthroughs are encouraging, but not yet sufficient. As NIST has pointed out, new algorithms need years to be proven secure, and many more to be implemented across the entire Internet infrastructure. Quantum-based systems are the clear nirvana for online security, but their point-to-point nature—they are only capable of transmitting data from A to B, not yet A to B to C, and so on, yields intractable scaling problems.

A comprehensive, global solution should accelerate the pace of security research so that it equals or exceeds that of quantum computing efforts and achieves a security solution before quantum computing is realized. One possible solution involves standing up a global technological alliance that can move through three stages: information sharing, technology demonstration, and large-scale implementation.

The first duty of this alliance is to unite the various quantum computing and post-quantum cryptography projects worldwide. Knowledge of both the readiness of quantum computers and the level of post-quantum cryptography will more clearly determine the stakes in the race. Then, such an organization can convene global summits, workshops, and competitions—functionally similar to the NIST call for proposals—to determine appropriate ways to keep communications secure into the future. Once these have been selected, the global body will be able to elevate the issue to global importance, politically and economically incentivizing the implementation of previously drafted solutions by governments across the world.

This is an ambitious project. But grand alliances for technological progress, in the presence of tense political dynamics, are not unprecedented. Take the International Space Station (ISS). Launched in 1982, the ISS program involves space agencies from 15 nations, all cooperating to conduct experiments in space that further our understanding of the world. The ISS has persisted at some level through significant geopolitical strife, in particular since the inclusion of Russia into the program in 1998. It has facilitated knowledge sharing for environmental and human health projects, and provided an educational platform to raise awareness of the issues ISS astronauts track.
The most challenging task in establishing such alliances is to balance the interdependence of partners with their reasonable concerns regarding individual competitiveness. NASA managed the ISS program with strict policy preferences: decisionmaking and system integration dominance, and robust protection of sensitive technology. Nowadays, NASA has relinquished such unilateral control, operating as an equal partner with Russia’s Roscosmos on the waning project.

Technology transfer issues will surely plague the post-quantum alliance. Collaboration with countries like China is sure to invoke security fears, and participants in the alliance will demand protection of their intellectual property. The inherently global nature of Internet security, however, mitigates this substantially. Security research follows a reliable pipeline from academia, for ideation; to industry, for implementation; to national agencies, for standard-setting and regulation. The first step here is particularly significant—the focus of academia in this field has not been individual competitiveness, rather, quite simply, the security of the Internet, on which all users depend. It was researchers from the Netherlands, Turkey, and Germany who jointly developed the “New Hope” algorithm used in Google’s post-quantum cryptography pilot.11

Leadership concerns are sure to arise over any global post-quantum cryptography project, as well. It is possible that, like NASA, NIST could guide the effort in its early days. This would please the United States; however, global partners may grow weary of unilaterally U.S.-led projects.

Regardless of its inherent complexities, a global framework as proposed above, acted upon with haste, gives the diverse citizens of the Internet a much better chance to reap the foretold benefits of quantum computing without having to weather its potentially far-flung costs. Post-quantum cryptography should not be a matter of national competitiveness. It clearly satisfies the two-pronged definition of a public good: its use by one does not reduce its availability to others, and, because of the Internet’s architecture, it cannot be provided to one party exclusively. Users must be protected from latent threats to their security. A functional and visible international alliance is one way to do so, and to retain trust in the Internet’s integrity during these times of “quantum nervousness.”

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2 There are more advanced techniques available to classical computers, but, after varying degrees of problem manipulation, they do all boil down to trying one number after the other. For more, see MIT student Yongwhan Lim’s exhaustive “Survey of Classical Integer Factorization Techniques,” March 22, 2012, https://pdfs.semanticscholar.org/6391/de77502b8eb566eff027be0e62d2fab311.pdf.


THE INTRODUCTION IN SEPTEMBER 2009 of a policy of “pragmatic engagement” toward Myanmar signified a shift in the United States’ Myanmar policy, which was marked by a sanctions-heavy approach under the Bush administration.1 The key idea underlying “pragmatic engagement” was that the Obama administration would aim to influence developments in Myanmar on the basis of a political dialogue at a senior political level. This new policy also has moved away from the previous policy of isolating the Burmese military and toward consideration of greater engagement. The Burmese military, officially known as the Tatmadaw, remains the most powerful institution shaping policy developments in the country. How the United States and the U.S. military engage the Tatmadaw is hence an issue of critical importance in seeking to bring about positive changes in Myanmar.

Although current levels of military-to-military engagement are minimal, there are clear areas where the United States has an interest in stronger cooperation from the Tatmadaw even beyond political reforms. Located at the nexus of East, South, and Southeast Asia, Myanmar occupies a strategically important location in terms of U.S. security interests abroad. Indeed, the United States has a history of working with the Tatmadaw; beginning in the late 1970s, the United States provided a humanitarian assistance program prompted by poverty in postwar Myanmar.2 During this period, the U.S. and Burmese armies cooperated on drug eradication efforts, and some Burmese military officials participated in the U.S. International Military Education & Training (IMET) program.3 The United States halted its military cooperation with Myanmar in 1988, however, when the Tatmadaw violently cracked down on a nationwide uprising, killing thousands of unarmed civilian protestors.4

Following Myanmar’s reforms in 2011, some U.S. policymakers have shown cautious interest in reviving military-to-military ties with the Tatmadaw.5 The Burmese side has also expressed interest in restarting military engagement with the United States.6 However, there are still real challenges along the route to successful revival. First, the United States must be mindful of the Burmese military generals’ historical distrust toward U.S. military involvement in Myanmar. Second, Washington will need to navigate the tensions inherent in engaging a military that has only recently allowed a transition to civilian rule after decades of military government and still maintains significant formal and informal...
power within the political system—an issue in which many members of Congress have demonstrated a keen interest. Third, and as a corollary to this second point, engagement will hinge in part on the Tamadaw’s willingness and ability to assuage concerns in Congress and among human rights groups over human rights.

Since independence, Myanmar has been wrought with domestic insurgencies that have threatened to break up the country. During the Cold War, the United States focused its military support toward Myanmar on preventing the spread of communism. To achieve this goal, the United States provided arms support to the Chinese Nationalist soldiers who retreated to Myanmar at the end of the Chinese Civil War. With border areas controlled by these Nationalist soldiers, the post-independence Burmese government found it hard to exert jurisdiction over all parts of the country. Given how they managed to retain national independence throughout the Cold War, the Burmese military generals clearly prioritize maintaining full sovereignty over the nation. Thus, before the United States plans on having a significant military presence in Myanmar, it should consider how to assuage Tamadaw leaders’ concern that renewed military cooperation with the United States might threaten Burmese sovereignty.

Another major challenge for U.S. policymakers in revamping military ties with Myanmar is to engage the Tamadaw in a way that would serve both U.S. interests and values. A strategic benefit for the United States in doing so is that it will balance the Tamadaw’s overreliance on Chinese military training and technological assistance. At the same time, U.S. leaders need to ensure that any engagement with the Burmese military abides by international humanitarian concerns. In recent months, news of military violence against the Rohingya, the Muslim minority in western Myanmar, has been widely reported. U.S. policymakers have made clear that the ultimate goal of their Myanmar policy is to transfer government power from the military to full civilian control. However, it remains unclear what awaits the military elites once the military has been transferred to civilian control. This could make the Burmese military elites reluctant to cooperate closely with the United States in reforming the military. How to balance these two competing needs remains a question that U.S. policymakers still need to answer to formulate a coherent Myanmar policy.
China’s role in Myanmar also presents a consideration for expanding U.S.-Myanmar military ties. Thanks to the 1,500 mile border between the two states, China has historically exerted significant influence over ethnic insurgents along the Sino-Burmese border. Chinese influence over these insurgents, who are still armed and actively fighting against the Tatmadaw forces, has been a sore point in Sino-Burmese relations.\textsuperscript{11} Since the Cold War, China has practiced a two-pronged policy toward Myanmar, funding the insurgents while preferring to keep the military in power in order to preserve stability in its neighbor.\textsuperscript{12} Burmese military leaders are aware of this, and have increasingly shown interest in seeking military cooperation with partners outside of China. The previous military-backed government and the current government under Aung San Suu Kyi have pursued ceasefires and peace talks with the armed ethnic groups, but this has proven difficult particularly with groups closely aligned with China in the north. This has prompted some concern about whether China supports the peace process.

Tatmadaw leaders’ distrust of Chinese intentions toward Myanmar’s domestic peace process presents an opportunity for the United States to expand cooperation with the Tatmadaw. However, it is also a difficult situation for the United States, which must make sure that any military training and equipment provided for the Tatmadaw meet the tight restrictions imposed by Congress and are not being used against ethnic minorities in the name of quelling domestic insurgencies.

The “pragmatic engagement” policy has many benefits over the sanctions-heavy approach that previously characterized U.S. policy toward Myanmar. Developing a good working relationship with Myanmar’s military leaders is clearly in the United States’ security interests in the Asia Pacific. The Trump administration should realize the strategic importance of continuing to engage the Burmese military, and be mindful of the challenges that lie in formulating a successful Myanmar policy.

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China’s Human Resources Crisis: Searching for the Sixth “Core” Leader

Juecheng (Frank) Zhao

IN JUST THREE YEARS, President Xi Jinping’s control of the Chinese Communist Party is indisputable. Xi now has a solid grip on personnel picks and the party mouthpiece, runs a formidable anticorruption shop, and stands at the helm as the commander in chief.

For Xi, consolidating power is only a first step to fulfill the party’s historic mission: to lead China’s revival to its 100th anniversary.1 But a 35-year vision is well beyond his term, and Xi faces three key challenges: Who will inherent the party? Who will implement his strategy? And will the party transform China, before the West transforms the party?

A generational challenge

Xi’s principal challenge is generational. Party succession patterns suggest the president who will assume office after the 100th anniversary will have been born between 1991 and 1994—precisely the age of current leaders’ children.2 This new generation of princelings is increasingly Western educated, and have thus developed an ideology considerably different from their parents.3

A groundswell of students from China’s “young and restless” middle class has joined the princelings in their study overseas. Between 2005 and 2015, the number of Chinese students in American universities increased fivefold, from 62,500 to 330,000, whereas the number in American high schools exploded from 65 to 33,600 over the same period.3

Growing up at the time of China’s acceptance into the World Trade Organization, this new generation constitutes a powerful force championing globalization. The question is, can the party adapt its ideology to the pace of change? Will the conservative political establishment reassert its authority, or be pragmatic in modifying its approach?

A utilitarian crisis

Meanwhile, the party is facing an existential crisis. Party loyalty is dwindling among millennials. A 2013 official survey shows that 88.6 percent of college students associate party membership with personal advancement, whereas only 29.4 percent did in 2005.4 The share of students committing to the party as “a faithful lifelong endeavor” in contrast, waned by a quarter over the same period.

Neither can the party rely on the princelings for succession. Party elites (including Xi himself) have sent their children abroad at a young age, for
higher-quality education and away from party politics.\textsuperscript{5} As a result, many second-generation princelings are bilingual and can easily bypass the censorship apparatus. Some even quietly retweet critiques of the party’s censorship policies.

\textit{Local is the new loyal}

Always a carefully choreographed endeavor, Chinese leadership politics leave little to the whims of chance—especially on the topic of succession. In August 2016, Xi launched the Communist Youth League reform to groom future party successors from the grassroots. The reform places local party cadets in challenging posts such as impoverished villages to weed out half-hearted opportunists, as the strong and faithful begin their “long march” from below.\textsuperscript{6}

In doing so, Beijing seeks to cultivate loyal political advisers at home. In 2015, Beijing unveiled a new push to build a network of Chinese think tanks to equip the leadership with hard knowledge and soft power to advance its global initiatives and regional development plans, particularly the “One Belt One Road.”\textsuperscript{7}

Amidst its inward turn, the party is still grooming the next generation of global elites. Tsinghua University, the alma mater of both Xi and Premier Li Keqiang, launched the Schwarzman Scholars program—China’s equivalent of Rhodes Scholars—to identify promising future leaders. After careful vetting, senior party cadets also receive executive training at Harvard Kennedy School.\textsuperscript{8}

\textit{A dilemma of trust}

While Beijing ramps up efforts to groom leaders at home, Xi is running short on talents for his global initiatives, such as “Going Out” and “One Belt One Road.” For instance, Chinese overseas railway projects suffered a series of setbacks in Thailand, Mexico, and California since 2014. A LexisNexis survey attributed the setbacks to talent shortages in political due diligence.\textsuperscript{9} A survey by the Center for China and Globalization also found that 63 percent of respondents view “the lack of global managerial talents” as “the main factor” in the failed expectations in overseas deals.\textsuperscript{10}

Xi is currently faced with a dilemma: trust those whom he uses, or use those whom he trusts. So far, the party has left its growing overseas talent pool untapped. Western education and long years overseas render their loyalty questionable, as they missed their college years in China to qualify for party membership—a prerequisite for entering public service in China.\textsuperscript{11} The party either outright rejects them or quietly bars them from key posts for not having the “right root and red shoot.”\textsuperscript{12}
Xi is currently faced with a dilemma: trust those whom he uses, or use those whom he trusts.

The 35-year question
Looking ahead to 2049, China’s centennial anniversary, the vast cultural shift the party requires to bridge the trust gap does not seem an insurmountable task. Studying abroad is already the mainstream, and state-owned enterprises are under heavy pressure to secure their oversea deals.\textsuperscript{13} While the party’s distrust of Western-educated students may constrain Xi’s global ambitions, the talent shortage is a tactical challenge, not a strategic one.\textsuperscript{14}

As leaders look 35 years ahead at the party’s centennial anniversary, who can be entrusted with the party’s future remains unclear. This question exposes the identity crisis at the heart of the Chinese Communist Party: what ideals will the party stand for? What vision does it propose for China and the world, beyond the “Chinese Dream” of national ascendance and prosperity?

A party at crossroads
The party’s recent turn to grassroots loyalists reflects a conscious effort to steer its post-centennial leadership away from Western influence, yet second-generation princelings are quickly rising through elite institutions in the United States and Europe, unhampered by political changes at home.

The timing of their rise is even more critical, as the new leaders will be set to take over right around the planned fulfillment of the “Chinese Dream” in 2049. Both grassroots loyalists and globalized princelings hold qualifications for their leadership, but experienced opposite ends of globalization.

In response, the party may have to reconcile two different views of the world: a world of opportunity and cooperation, and one of threats and struggle. China’s consensus on market-driven reforms since Deng Xiaoping’s “opening up” in 1978 could come under question, as globalization faces another uncertainty from its former champions.

A delicate balance
The rise of two ruling classes in China, both highly qualified, could threaten to upend the party’s long-time unity and may be an unacceptable outcome to party elders. Yet it remains unclear how China can intermingle a class of globally educated elites with local-grown cadets who rose from the society’s bottom. Policy constraints and external pressure may contain the disagreements within a manageable scope, but the divergent visions are likely to persist and possibly smolder.
It remains an open question whether Chinese pragmatism can prevail over ideological dogma. As China advances toward the “Chinese Dream” and faces the existential void following the centennial mark, it will be critical to keep a close eye on the inner-party dynamics between the elites and the loyalists, how the party modifies its approach, and how it adapts to new challenges. Still, one thing is certain—with overseas-educated talents constituting a force to be reckoned with, China’s future will never be the same.

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The anniversary is also the scheduled date for fulfilling the “Chinese Dream,” which Xi proposed as soon as he assumed power in late 2012.

The first president after 2049 will take office in 2052, at an age between 59 and 60 (with a one-year margin of error).

A KPMG survey further found that 85 percent of millionaires plan to send their children overseas for education.


In comparison, hiring students from the “Imperialist America” selling out national assets may not be such a bad idea.

The “35 years” is calculated from the party’s first succession after reaching its centennial goal in 2052.
IN HIS LATEST BOOK, *The Man Who Knew: The Life and Times of Alan Greenspan*, Sebastian Mallaby has written the most comprehensive account yet of the life of the legendary former chairman of the Federal Reserve, Alan Greenspan. Combining direct interviews with the subject and new archival research, including Greenspan’s own previously unread graduate thesis, Mallaby provides a compelling narrative of the life of Greenspan from his childhood in Washington Heights to his long career as a high-powered Washington policymaker. Accompanying this portrait is Mallaby’s own critique of Greenspan’s much-maligned role in the global financial crisis of 2008. He argues that Greenspan, as the title of the book suggests, knew full well the risks the housing bubble posed to the financial system, and that he could have moved more forcefully to head off the crisis. Despite his impressive biographical work, Mallaby fails to convince with his policy analysis, and in doing so illustrates the limits of economic policymaking.

What is remarkable is how Greenspan truly was “the man who knew” through almost his entire career, anticipating new economic trends well before disaster came. Greenspan rightly foresaw the limits of government intervention in the economy far earlier than most, and found his belief in *laissez-faire* capitalism validated in Nixon’s failure to contain inflation through price controls in the wake of the first oil shock in 1973. This prescience stayed with him as he transitioned into more and more senior roles, and even through the end of his storied career at the Federal Reserve. Contra the conventional wisdom, Greenspan was also never a believer in fully rational markets, often wary of what he later termed “irrational exuberance.” Indeed, he had long been worried about the potential impact of the collapse of asset prices, and on many occasions pushed for new regulation.

Where Mallaby’s biography is most insightful is in demonstrating how Greenspan learned to play the game of partisan politics to his advantage. First as chairman of the Council of Economic Advisers under President Gerald Ford, he carefully cultivated an image as a dispassionate technocrat, all while building personal relationships with key players in and out of government. Despite having early disagreements with the more conservative elements of the Reagan
administration, Greenspan’s mastery of economic data and foresight helped elevate him to the Federal Reserve, where he would remain for the next 18 years under presidents from both parties.

Greenspan’s foresight coupled with his substantial political power reveals the central tension at the heart of Mallaby’s narrative: why didn’t the man who knew do more to address the mounting risks in the run-up to the global financial crisis? The book offers several examples that show Greenspan was ready to fight for new regulatory powers that would have helped tackle the housing bubble. He also possessed enormous influence over the Federal Reserve’s ability to set interest rates. Still, the bubble built and, ultimately, burst. Mallaby argues that, given what Greenspan knew about the dangers of the housing bubble, he should have used monetary policy more forcefully to rein in rising asset prices. Raising interest rates, Mallaby reasons, might have constrained borrowing and precipitated an earlier (and less catastrophic) repricing in the mortgage market.

The trouble with Mallaby’s analysis is that it fails to appreciate Greenspan’s actual responsibilities and the tools available to him. The Federal Reserve is legally charged with pursuing two macroeconomic objectives, “the dual mandate”: full employment and stable price growth. Greenspan met both of his formal objectives for most of the 1990s and 2000s, the era now known as the Great Moderation. By contrast, the Fed has no formal mandate to manage asset prices. This is important to consider, given that pursuing Mallaby’s suggested course would have required Greenspan to tackle a desirable—but not mandatory—policy objective at the expense of his formal obligations.

The Fed pursues its dual mandate through the management of interest rates. In order to bring asset prices down, Greenspan would have had to raise interest rates, a policy step that typically lowers economic growth, and raises unemployment. If this had also been effective in popping the housing bubble, then Americans would have seen their home values fall, likely leading to an even sharper fall in growth as households saw the value of their biggest asset collapse and tightened their belts accordingly. This is in fact what happened from 2007...
to 2009; acting to deliberately precipitate such an outcome, as Mallaby suggests, might have done little more than simply bringing the crisis forward.

Put differently, Mallaby’s own account of Greenspan’s “life and times” suggests that the Federal Reserve chair was fulfilling his fundamental duties, and that Mallaby’s advice would have likely made matters worse. How then should we judge Greenspan’s actions, and his possible role in the crisis? Here, Greenspan’s successor as Fed chair, Ben Bernanke, has the most astute reading, that “Greenspan took the monetary actions he did . . . because at the time he thought they were the best policy.” Mallaby’s biography is the best evidence, a masterful account of the man’s experience that informed his policy choices to the very end.

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4 See Mallaby, The Man Who Knew, 463, for an example of Greenspan’s power over the Federal Open Market Committee.


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