Confluence INVESTMENT MANAGEMENT

Bi-Weekly Geopolitical Report

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Update on the U.S.-China Military Balance of Power

In early 2021, we published a series of reports assessing the overall balance of power between the United States and China in military, economic, and diplomatic terms. Looking comprehensively at both countries' power and sources of power, we judged that the U.S. retains the greater capacity to influence the world and protect its interests. However, we noted that China has closed the gap significantly, especially in military terms. For example, China now has the world's largest navy, and it can deploy enormous forces to the South China Sea, the East China Sea, and the Taiwan Strait. China's coastal military forces are now strong enough to potentially deter the U.S. from intervening in a crisis around Taiwan.

In this report, we provide an update and additional analysis on China's military development over the last two years. We extend the discussion to cover China's rapid buildup of its strategic nuclear arsenal and how that could spur a destabilizing new arms race around the world. We conclude with the implications for investors.

China's Military Resources

The U.S. Department of Defense, in its "2022 China Military Power Report," says Chinese President Xi Jinping has directed the People's Liberation Army (PLA) to transform itself into a "world-class military" by 2049. China therefore continues to flood the PLA with resources and attention, boosting its capabilities to the point where it is now ahead of the U.S. in several key areas.

Manpower. A country's potential military power ultimately derives from the size and quality of its population, economy, industrial base, and technological skills. From that standpoint, China had the advantage of being the world's most populous country, at least through the first half of 2022. The United Nations Population Division estimates that China's population in mid-2022 was 1.426 billion people, including a military-age population (ages 16-49) of 662.6 million. The UN demographers believe India's population will exceed China's by mid-2023, but China still has many more people than the U.S. The U.S. population in mid-2022 stood at 338.3 million, with 150.9 million people of military age.

- Of course, China's population is declining compared to the U.S.'s, which is still growing. Based on recent trends, China's military-age population is falling by about 9.3 million per year, while the U.S.'s military-age cohort is growing by about 45,000 annually.

- Despite that disparity, China will likely retain an advantage in the number of available soldiers for years to come. A more important demographic challenge for China is that virtually all of its soldiers, sailors, and airmen are their family's only child, owing to the country's past one-child policy. In a major conflict with mass casualties,

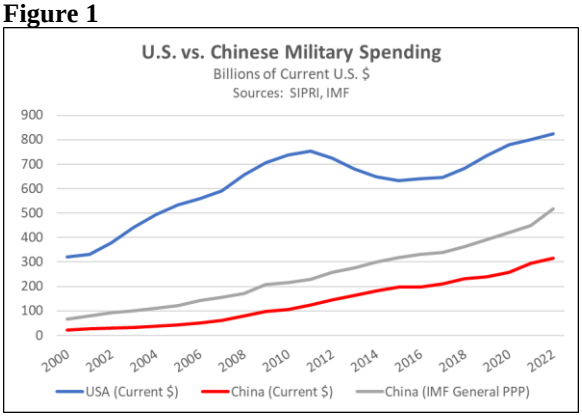
thousands of Chinese parents would lose their only child, potentially creating political pushback on the government.

Economy. Adjusted for the purchasing power of its currency, China's economy is the largest in the world. The International Monetary Fund estimates that China's 2022 gross domestic product (GDP) had a value of $30.1 trillion, easily surpassing the U.S.'s GDP of $25.0 trillion. Chinese leaders, therefore, have plenty of financial resources available to sustain and grow their military forces without imposing an onerous burden onto the country's economy.

- Data from the Stockholm International Peace Research Institute and official Chinese statements suggest the country spent $314.2 billion on defense in 2022, or 1.7% of GDP. Applying the IMF's parity adjustment ratio for the entire Chinese economy, that would equate to spending power of $516.1 billion in the U.S. However, we suspect the Chinese military enjoys especially preferential pricing and other subsidies when buying goods and services, so the actual purchasing power of China's defense budget could be even greater.

- For comparison, the U.S. spent about $824.4 billion on defense in 2022. That's a lot higher than China's outlay (see Figure 1), but the U.S. total reflects the cost of a well-established global hegemon, with its hundreds of military bases all over the world, many foreign security commitments, and global interests. With the U.S.'s global defense commitments in mind, we note that its 2022 defense spending was equal to $4,302 for every square mile of the Earth's surface excluding Antarctica. If we assume China's current core interests extend only over the eastern half of the Northern Hemisphere (one-quarter of the Earth's surface), its total adjusted spending in 2022 equaled $10,485 per square mile of its defense sphere.

Figure 1



Technology. China's large and varied land mass provides it with many key natural resources. Importantly, its rapid economic development, forced or illicit technology transfers, and espionage have also given it formidable technological resources. China's "military-civilian fusion" policy (led personally by President Xi as chairman of the Central Commission for Military-Civil Fusion Development) ensures that the private sector's industrial capacity, technological discoveries, data, and intelligence are shared seamlessly with the military to make it more powerful. The U.S. is trying to retain its technological edge by clamping down on advanced technology exports to China, but China has already closed much of the gap and is improving its ability to innovate and develop its own new, cutting-edge technologies.

Order of Battle

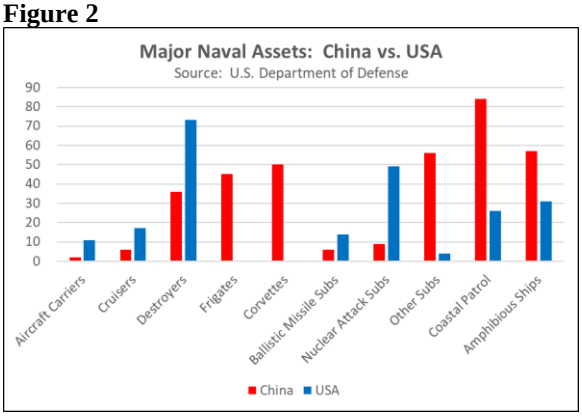
An exhaustive list of all Chinese military assets is beyond the scope of this report. The discussion below merely highlights China's key assets as well as the current modernization and readiness efforts for each service, based mostly on the Defense Department's latest China Military Power Report.

Naval Forces. Since a U.S.-China war would likely be fought in the waters around China, tracking China's naval strength is critical. In numerical terms, the PLA Navy is now the world's largest, with an overall battle force of 340 ships and submarines, including more than 130 major surface combatants. Reflecting the potential for a major naval war with the U.S. and the growing need to project Chinese power globally, the PLA has invested heavily in its navy. It now consists mostly of modern, multi-role vessels with advanced anti-ship, anti-air, and anti-submarine weapons and sensors, rather than the obsolete, limited-capability coastal defense ships of old. China's investment in naval modernization and readiness will soon allow it to conduct long-range precision strikes against land targets using cruise missiles launched from a range of vessels, greatly boosting its power projection capability and giving it a true "blue water navy."

- China's naval battle force has now shrunk by 10 ships compared with the figures we used in our 2021 report, but that's only because the PLA Navy transferred 22 older frigates to the country's coast guard. Most of those were replaced by new, highly modern hulls, leaving the PLA Navy's frigate force down by only four. The rosters of coastal patrol and amphibious landing ships also fell slightly, but that masked an active program of replacing older units with newer, more capable ones.

- As shown in Figure 2, the U.S. Navy continues to outnumber the PLA Navy in the largest, most capable blue-water platforms such as fixed-wing aircraft carriers, cruisers, destroyers, ballistic missile submarines (SSBNs), and nuclear-powered attack subs (SSNs). The PLA Navy continues to emphasize smaller, less capable vessels (such as frigates and diesel-electric subs) that are better geared toward coastal defense and operations in nearby waters, which reflects China's "anti-access/area denial" (A2/AD) strategy meant to deter the U.S. Navy from intervening in a potential conflict around Taiwan. Still, the PLA Navy continues to build up its blue-water force. Compared with two years ago, it has increased its cruiser and destroyer count by nine hulls and its count of SSBNs and SSNs by five.

Figure 2



- In 2019, China commissioned its first domestically built aircraft carrier, the *Shandong*, based on the design of its Soviet-built *Liaoning*. Both carriers use a ski-jump aircraft launch system. In mid-2022, China launched a more advanced domestic carrier, the *Fujian*, which uses a modern electromagnetic catapult system similar to that of the latest U.S. carriers. That system will allow *Fujian* and her future sister ships to support more aircraft types and faster flight operations. After *Fujian* is commissioned in about a year, China also plans to develop nuclear-powered carriers and eventually deploy two carrier strike groups to the Western Pacific and two to the Indian Ocean. China is also upgrading and modernizing its fleet of amphibious assault ships,

which could be used to invade Taiwan or other coastal areas.

Air Forces. At over 2,800 aircraft (excluding trainers and drones), of which 2,250 are combat aircraft, China's army air force and naval aviation together constitute the largest air force in the Indo-Pacific region. China's 2019 defense white paper reports that the air force's mission and tasks are transitioning from "territorial air defense" to "offensive and defensive operations." Its commander has tasked the service with developing a truly strategic capability that can project power at long range. The Defense Department believes China "is rapidly catching up to Western air forces" as it takes delivery of more modern, domestically built planes and drones and intensifies pilot training.

- Most of China's 1,500 operational fighters are modern fourth-generation or above aircraft, including 24 Su-35 fighters bought from Russia in 2016. China has also deployed at least 200 of its domestically built fifth-generation J-20 fighters. The J-20's original Russian engines are being replaced with new, superior engines designed and manufactured in China, helping it rival the U.S.'s F-22 Raptor. China also continues to develop the smaller FC-31/J-31 for export or for the next generation of Chinese aircraft carriers.

- China's bomber force consists of variants of the Soviet Tu-16 "Badger." The bomber force is relatively old, but China continues to produce modernized versions by integrating standoff weapons and more efficient engines for greater range. The new H-6N, which is capable of air-to-air refueling and can carry nuclear weapons, again gives China a triad of nuclear delivery options, i.e., land-based, submarine-based, and air-launched. Its H-20 subsonic stealth bomber, which is still under development, will eventually give China the ability to strike U.S. bases in Guam, Japan, and even Hawaii.

- The Chinese have one of the world's largest arsenals of advanced, long-range surface-to-air missile systems (SAMs) which would be of critical importance in a potential conflict with the U.S. in the Taiwan Strait. Along with long-range, state-of-the-art S-400 and S-300 systems from Russia, the Chinese are also developing their own advanced SAMs and anti-ballistic missile defenses.

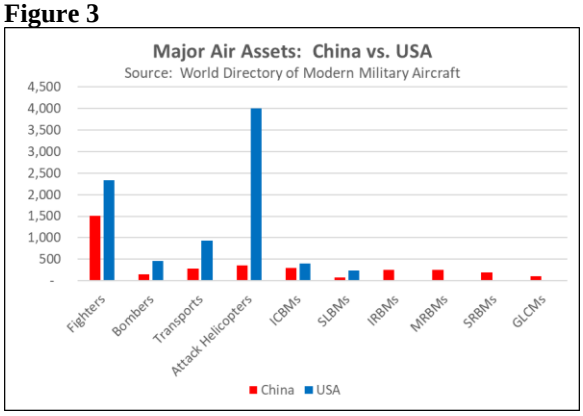
Ground Forces. The PLA has the world's largest standing ground force, with approximately 975,000 active-duty troops in combat units. Perhaps because of the greater likelihood of a naval war with the U.S. and the need to prioritize a blue-water navy, modernization and readiness in China's ground forces have advanced relatively slowly. Vehicle and weapons upgrades have been proceeding, but just as much emphasis has been placed on building up flexible, more lethal combined-arms brigades at lower echelons and introducing more intense and realistic training.

Strategic Rocket Forces. China is working hard to strengthen its "strategic deterrent" forces. As one sign of that, it launched more ballistic missiles for testing and training in 2021 than the rest of the world combined. One aspect of China's effort is its huge and growing arsenal of short- and intermediate-range missiles. Those missiles provide saturated, redundant coverage over the waters touching China's coast out to the "first island chain" running from Borneo up through the Philippines to Japan and beyond. The missiles are a key part of China's A2/AD strategy to keep the U.S. out of any conflict surrounding Taiwan. Since our initial report two years ago, however, China has begun a potentially more important effort to boost its long-range,

intercontinental nuclear missile force. We describe the basics of that effort here and will discuss its implications in a later section.

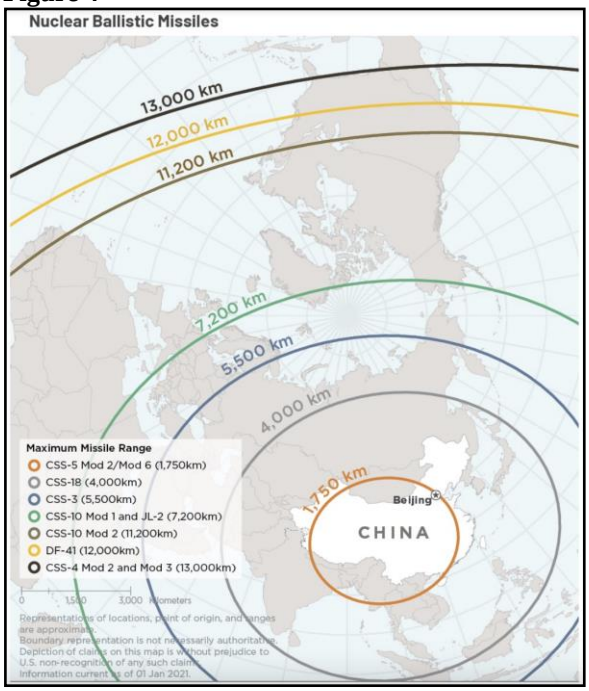
- China's conventional rocket force includes many mobile ground-launched short-, medium-, and intermediate-range ballistic missiles and ground-launched cruise missiles to supplement its air- and sea-launched precision strike force. It also continues to expand its inventory of modern, nuclear-capable intermediate-range ballistic missiles (IRBMs). While the U.S. retains a vast predominance over China in fixed-wing aircraft and helicopters, China's arsenal of missiles is far larger and more diverse than that of the U.S. (see Figure 3). The U.S. disadvantage in missiles largely reflects the arms control treaties of the Cold War era. Even as those treaties are abandoned, it will take the U.S. years to catch up to the Chinese arsenal.

Figure 3



- China's long-range, strategic nuclear force is becoming even more menacing and concerning. China is fielding new static and road-mobile intercontinental ballistic missiles (ICBMs) capable of carrying multiple independently targeted reentry vehicles (MIRVs). Many of these missiles can strike the Continental U.S. (see Figure 4). China is also building several new solid-fuel ICBM silo fields in the isolated western parts of its country. The Defense Department estimates that at least 300 silos are under construction. When completed, these silos will put China even further ahead of the U.S. in terms of ground-based ICBM launchers. If each of the 300 silos eventually houses a MIRV missile with 10 warheads, those alone would have twice the 1,550 available nuclear weapons that the U.S. currently has in its ground silos, bomber aircraft, and submarines. The Defense Department forecasts that China will have more nuclear warheads than the U.S. can deploy by 2035.

Figure 4



- Beyond boosting the numbers of missiles in its arsenal, China also continues to upgrade its technology, especially in hypersonics (missiles that can travel at several times the speed of sound and are very hard to intercept). China's YJ-21 is a dedicated anti-ship hypersonic missile with a terminal speed of Mach 10. Even more alarming, in late

2021, China successfully tested a "fractional orbital bombardment system" with a maneuverable hypersonic glide vehicle designed to deliver nuclear warheads. This missile goes into orbit for as long as its operator determines, then reenters the atmosphere and releases a hypersonic glide vehicle that can maneuver to avoid anti-missile defenses. China, like Russia, remains far ahead of the U.S.'s plodding efforts at hypersonic technology.

Space and Cyber Forces. The PLA's Strategic Support Force (SSF) is responsible for China's strategic space, cyber, electronic, and psychological warfare efforts. Reporting directly to the Central Military Commission, its main target is the U.S. Establishment of the SSF reflects Beijing's belief that "achieving information dominance and denying adversaries the use of the electromagnetic spectrum is necessary to seize and maintain the strategic initiative in a conflict."

- The ***Network Systems Department*** carries out and coordinates all of China's information warfare missions, including cyberwarfare, technical reconnaissance, electronic warfare, and psychological warfare. It is instrumental in China's military strategy to establish local dominance in the information, maritime, and air domains. It also carries out missions and tasks related to the PLA's "Three Warfares" concept (undermining an adversary through psychology, public opinion, and legal warfare). It works to shape foreign perceptions, weaken the enemy's will to fight, and craft diplomatic and political narratives to advance China's interests globally.

- The ***Space Systems Department*** is responsible for all PLA space operations, including space launch and support, space surveillance, satellite communications, and space warfare. The department aims to assist in future conflicts by enabling long-range precision strikes and denying adversaries the use of space assets. Overall, China has put scores of spacecrafts into orbit in recent years. Its constellation of BeiDou-2 and BeiDou-3 communications and navigation satellites will now allow China to end or reduce its reliance on the U.S. GPS system. China is also focused on the development of heavy-lift vehicles that could support lunar and interplanetary exploration, while the PLA continues to develop counterspace capabilities such as kinetic-kill missiles, ground-based lasers, and orbiting space robots.

Impact on Great-Power Nuclear Strategy

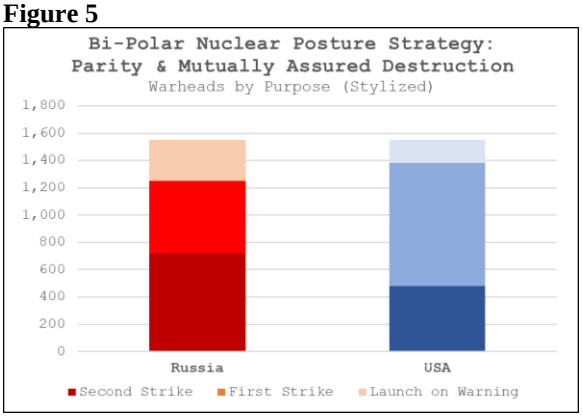
As shown in this report, China continues to shower its military with resources to expand its size, raise its capabilities, and eventually fight and win wars with an adversary like the U.S. (see summary table, last page). That effort is entirely consistent with China's goal of displacing the U.S. as the world's hegemon. It also helps explain why the U.S. and its allies have finally become more alarmed about China's increasing geopolitical aggressiveness and are taking steps to suppress China's growing power. For example, the U.S. and its allies have begun boosting their own defense spending and crimping China's access to cutting-edge computer chips. China's growing military power is also furthering the current fracturing of the world into rival U.S.-led and China-led geopolitical and economic blocs.

As bad as that is, China's new program to expand its nuclear weapons arsenal will be even more destabilizing. It would be impossible to explain all the critical aspects of nuclear strategy in this short report, but

below we raise some of the issues that could lead to even greater frictions between China and the West, potentially triggering a risky new nuclear arms race.

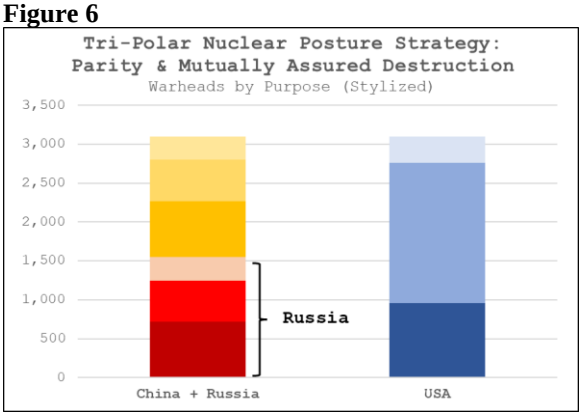
- During the decades-long standoff between the U.S. and the USSR during the Cold War, "bipolar" nuclear stability was built on ***parity*** (similar numbers of nuclear weapons on each side) and ***mutually assured destruction*** (MAD, or the certainty that if one side launched a nuclear attack on the other, it would be destroyed by a retaliatory strike). Cold War arms-control treaties, embodied today by the New START agreement, have left the U.S. and Russia with parity at a maximum of 1,550 deployed nuclear weapons each. The U.S. and Russian arsenals are also still designed for MAD. Some of each side's arsenal is set to "launch on warning," i.e., ready to be launched as soon as incoming missiles are detected but before they hit. A large part of each arsenal is designated for a "first strike" against the adversary. A final portion is designed to survive a first strike and be ready for a "second strike" to retaliate (see Figure 5).

Figure 5



- As China expands its nuclear arsenal to match or surpass that of the U.S., the new "tripolar" nuclear world will be less amenable to parity and MAD. The U.S., China, and Russia will all need to deter and potentially defend against ***two*** nuclear powers, which may or may not be cooperating with each other. If one nation, such as the U.S., tries to keep parity with ***both*** adversaries, it would end up with more weapons than either individual adversary (see Figure 6). Not only would that violate parity, but it might also tempt the U.S. into thinking it could attack one of its adversaries, such as China, without being destroyed itself. Of course, China is drawing Russia closer into its evolving geopolitical camp, so China and Russia may cooperate against the U.S. In this scenario, Russia might attack the U.S. in retaliation for its attack on China. But Russia could also take advantage of the situation to attack both China and the U.S. while they are damaged.

Figure 6



- The implication is that China's accelerating nuclear weapons program is likely to spark a new global arms race. Since New START is already weakened by accusations that Russia has violated it, the treaty might finally be abandoned, freeing the U.S. to dramatically expand its arsenal even beyond its current nuclear modernization program. But as each side tries to keep up with two adversaries, parity will never be reached, and MAD will be questioned. This environment will create a higher risk of

accidental and/or catastrophic conflict than even was seen at the height of the Cold War.

Investment Implications

China's continued effort to strengthen its military power versus the U.S. is likely to further exacerbate tensions between the two countries and their respective geopolitical blocs. China is not only buying more weapons systems and boosting their capabilities, as our discussion above emphasizes, but it is also intensifying and improving its forces' training, logistics, and joint military exercises with like-minded countries. The resulting increase in tensions is likely to further disrupt trade, technology, and capital flows between the U.S. and China blocs, potentially leaving investors flat-footed. Sudden new decoupling measures have the potential to affect asset values and undermine corporate operations in unpredictable ways.

In this environment, Chinese stocks and the equities of countries allied with China are likely to be especially at risk. In contrast, if the U.S. seeks to offer economic and security incentives to its allies and neutral countries in order to wean them away from China, those countries' stocks might benefit. In a similar manner, U.S. companies with extensive supply chains or markets in China or its bloc could be at heightened regulatory risk. Firms that produce and sell mostly within the U.S.-led geopolitical bloc may be relatively safer. With tensions boosting defense budgets all over the world, we continue to believe that defense industry stocks have bright prospects.

As rising tensions drive the U.S.-led bloc to further decouple from the China-led bloc, the severing of supply chains and the establishment of new, more resilient supply chains within the U.S. bloc will likely exacerbate consumer price inflation and prompt higher interest rates. That outcome is likely to be negative for bonds going forward. However, we continue to believe that geopolitical fracturing will also involve a displacement of commodity supplies, especially for the mineral commodities that are likely to be weaponized by the China-led bloc. We believe these conditions will put persistent upward pressure on commodity prices and lead to a period of unusually strong commodity returns in the coming years. Uranium returns could be especially strong.

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Confluence Investment Management LLC

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Military Balance of Power: China vs. USA

Selected Indicators

Sources: UN, IMF, U.S. Dept. of Defense, WDMMA.org, GlobalFirepower.org, Bull. Of Atomic Scientists

Asset	China	USA	Advantage
Resource Base			
Total Population (Millions, 2022)	**1,425.9**	**338.3**	**China**
Military-Age Population (16-49, Millions, 2022)	**662.6**	**150.9**	**China**
Average Annual Growth Rate, Last Five Years	-1.4%	0.3%	**USA**
Gross Domestic Product (Trillion $ PPP, 2022)	**30.1**	**25.0**	**China**
Average Growth Rate, Real, Last Five Years	5.2%	1.8%	**China**
Foreign Military Bases (2018)	**1**	**514**	**USA**
Likely/Potential Allies *	**0**	**>=4**	**USA**
Naval Forces			
Total Battle Force	**340**	**294**	**China**
Major Surface Combatants	**139**	**101**	**China**
Fixed-Wing Aircraft Carriers	2	11	**USA**
Cruisers	6	17	**USA**
Destroyers	36	73	**USA**
Frigates	45	0	**China**
Corvettes	50	0	**China**
Submarines	**71**	**67**	**USA**
Ballistic Missile Submarines	6	14	**USA**
Nuclear Attack Submarines	9	49	**USA**
Other Submarines	56	4	**China**
Coastal Patrol (Missile)	**84**	**26**	**China**
Amphibious Landing Ships	**57**	**31**	**China**
Air Forces			
Fixed-Wing Aircraft	**2,130**	**5,124**	**USA**
Fighters	1,515	2,338	**USA**
Bombers and Close Air Support	150	465	**USA**
Transports	286	939	**USA**
Special Mission Aircraft	179	1,382	**USA**
Helicopters	**912**	**5,421**	**USA**
Attack (Multi-Role, Gunship, Anti-Sub, etc.)	363	4,012	**USA**
Transports	132	912	**USA**
Other	417	497	**USA**
Rockets (Launchers; Missiles May Be Greater)	**1,172**	**640**	**China**
ICBM (Range > 5,500 km)	300	400	**USA**
SLBM (Range > 5,500 km)	72	240	**USA**
IRBM (Range 3,000 to 5,500 km) **	250	0	**China**
MRBM (Range 1,000 to 3,000 km) **	250	0	**China**
SRBM (Range 300 to 1,000 km) **	200	0	**China**
GLCM (Range > 1,500 km) **	100	0	**China**
Land Forces			
Active-Duty Personnel in Combat Units * **	**975,000**	**473,000**	**China**
Main Battle Tanks	**4,400**	**5,500**	**USA**
Other Armored Vehicles	**35,000**	**40,000**	**USA**
Artillery Pieces	**7,374**	**4,055**	**China**

Notes

** Assumes U.S. allies would include at least Japan, Australia, New Zealand, and India.*

*** U.S.-Russia INF Treaty banned U.S. from developing these; treaty abrogated in 2019.*

**** U.S. combat ground forces figure includes only U.S. Army, excludes U.S. Marines.*