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CHINESE MILITARY MODERNIZATION AND FORCE DEVELOPMENT

A Western Perspective

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Introduction

Chinese Military Modernization and Force Development: A Western Perspective

The US and China face a critical need to improve their understanding of how each nation is developing its military power and how to avoid forms of military competition that could lead to rising tension or conflict between the two states.

One key tool in building this understanding is to create an unclassified dialogue on the military developments in each country, the size of each country's current and planned military forces, and the structure of each country's current and planned military forces. The Burke Chair has developed a detailed analysis of the unclassified data on the trends in Chinese military forces since 1985, examining how these trends interact with the trends in Chinese military spending and strategy.

This paper is written by Nicholas S. Yarosh – who carried out the detailed force analysis -- and by Anthony H. Cordesman. It is entitled ***Chinese Military Modernization and Force Development: A Western Perspective***. It is available on the CSIS web site at http://csis.org/files/publication/120621_Chinese_Military_Modernization.pdf.

This report is intended to provide a basis for improving the dialogue between the US and China over the changes in both US and Chinese forces: it is also meant to provide both US and Chinese analysts with a better basis for understanding Western estimates of the changes in Chinese force strength and force quality. It notes that important changes are taking place in US strategy as well and that these changes must be considered when evaluating Chinese actions. However it cautions that neither side should be seen in terms of a narrowly defined military balance or seen as a threat to the other.

The paper also makes it clear that any Western analysis of Chinese military developments will never be complete without a Chinese review and commentary. Moreover, this report is meant to convey the reality that focusing on strategy and concepts in broad terms is no substitute for a detailed examination of specific changes in force strength, the extent to which concepts and strategy are actually being implemented, and how the shifts in US and Chinese forces actually compare.

Putting Chinese forces in a US Perspective

This report addresses the unclassified data available in the West on the trends in Chinese military forces. It relies heavily on the data in the annual military balance of the International Institute for Strategic Studies (IISS), but covers a range of sources. It should be noted that this report does only cover Chinese forces, and therefore only presents one side of the issue.

The US does have major forces in the Pacific area. The US Pacific Command (PACOM) reported in early June 2012 that these forces included four component commands: US Pacific Fleet, US Pacific Air Forces, US Army Pacific, and US Marine Forces Pacific. These commands are headquartered in Hawai'i and have forces stationed and deployed throughout the region.

As of June 2012, USPACOM had some 250,000 military personnel, or about one-fifth of total US military strength. US Navy and Marine forces were numerically the largest elements in the AOR. The US Pacific Fleet included five aircraft carrier strike groups. The US Marine Corps

Pacific possessed about two-thirds of US Marine Corps combat strength. The entire US Navy-Marine team comprised more than 135,000 personnel, 180 ships, and 1,400 aircraft.

US Air Forces Pacific comprised approximately 39,000 airmen and 350 aircraft; and the US Army Pacific had about 50,000 personnel, including four Stryker brigades. USPACOM also had more than 1,200 Special Operations personnel. Finally, there were more than 13,000 US Coast Guard personnel available to support U.S. military forces in the region.

America's Developing Strategy in Asia

Any analysis of the trends in Chinese military power must be prefaced by the fact that the US is also changing its force posture in Asia as part of major changes in its overall strategy. However, it should be stressed that such plans are now highly uncertain because of problems in the US economy and the uncertainties surrounding future US defense spending.

US Secretary of Defense Leon Panetta summarized the shifts in US strategy as follows in a speech to the Shangri-La Security Dialogue in Singapore on Saturday, June 02, 2012. It is critical to note that he did not discuss major increases in US forces and instead focused on the need for US and Chinese cooperation and dialogue:

> The purpose of this trip, and of my remarks today, is to explain a new defense strategy that the United States has put in place and why the United States will play a deeper and more enduring partnership role in advancing the security and prosperity of the Asia-Pacific region, and how the United States military supports that goal by rebalancing towards this region.
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> … America's fate is inexorably linked with this region. This reality has guided more than six decades of U.S. military presence and partnership in this region -- a defense posture which, along with our trading relations, along with our diplomatic ties, along with our foreign assistance, helped usher in an unprecedented era of security and prosperity in the latter half of the 20th century.
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> In this century, the 21st century, the United States recognizes that our prosperity and our security depend even more on the Asia-Pacific region. After all, this region is home to some of the world's fastest growing economies: China, India, and Indonesia to mention a few. At the same time, Asia-Pacific contains the world's largest populations, and the world's largest militaries. Defense spending in Asia is projected by this institute, the IISS, to surpass that of Europe this year, and there is no doubt that it will continue to increase in the future.
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> Given these trends, President Obama has stated the United States will play a larger role in this region over the decades to come. This effort will draw on the strengths of the entire United States government. We take on this role not as a distant power, but as part of the Pacific family of nations. Our goal is to work closely with all of the nations of this region to confront common challenges and to promote peace, prosperity, and security for all nations in the Asia-Pacific region.
>
> … We will play an essential role in promoting strong partnerships that strengthen the capabilities of the Pacific nations to defend and secure themselves. All of the U.S. military services are focused on implementing the president's guidance to make the Asia-Pacific a top priority. Before I detail these specific efforts, let me provide some context for our broader defense strategy in the 21st century.
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> The United States is at a strategic turning point after a decade of war. We have significantly weakened al-Qaida's leadership and ability to attack other nations. We have sent a very clear message that nobody attacks the United States and gets away with it.
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> Our military mission in Iraq has ended and established—established an Iraq that can secure and govern itself.

In Afghanistan, where a number of Asia-Pacific nations are playing a critical role in the international coalition, we have begun our transition to the Afghan security lead and to an Afghanistan that can secure and govern itself. Recent meeting in Chicago, NATO and its partners—over 50 nations—came together to support General Allen's plan to accomplish this goal. In addition to that, we joined in a successful NATO effort to return Libya to the Libyan people.

But even as we have been able to draw these wars to a hopeful end, we are confronted today by a wide range of complex global challenges. From terrorism—terrorism still remains a threat to the world—from terrorism to the destabilizing behavior of Iran and North Korea, from nuclear proliferation to the new threat of cyberattack, from continuing turmoil in the Middle East to territorial disputes in this region.

At the same time, the United States, like many other nations, is dealing with large debt and large deficits, which has required the Department of Defense to reduce the planning budget by nearly half a trillion dollars or specifically $487 billion that were directed to be reduced by the Congress in the Budget Control Act over the next decade. But this new fiscal reality, challenge that many nations confront these days, has given us an opportunity to design a new defense strategy for the 21st century that both confronts the threats that we face and maintains the strongest military in the world.

This strategy makes clear the United States military, yes, it will be smaller, it will be leaner, but it will be agile and flexible, quickly deployable, and will employ cutting-edge technology in the future. It makes equally clear that while the U.S. military will remain a global force for security and stability, we will of necessity rebalance towards the Asia-Pacific region. We will also maintain our presence throughout the world. We will do it with innovative rotational deployments that emphasize creation of new partnerships and new alliances. We will also invest, invest in cyber, invest in space, invest in unnamed systems, invest in special forces operations. We will invest in the newest technology and we will invest in the ability to mobilize quickly if necessary.

We have made choices and we have set priorities, and we have rightly chosen to make this region a priority. Our approach to achieving the long-term goal in the Asia-Pacific is to stay firmly committed to a basic set of shared principles -- principles that promote international rules and order to advance peace and security in the region, deepening and broadening our bilateral and multilateral partnerships, enhancing and adapting the U.S. military's enduring presence in this region, and to make new investments in the capabilities needed to project power and operate in Asia-Pacific. Let me discuss each of these shared principles.

The first is the shared principle that we abide by international rules and order. Let me underscore that this is not a new principle, our solid commitment to establish a set of rules that all play by is one that we believe will help support peace and prosperity in this region. What are we talking about? These rules include the principle of open and free commerce, a just international order that emphasizes rights and responsibilities of all nations and a fidelity to the rule of law; open access by all to their shared domains of sea, air, space, and cyberspace; and resolving disputes without coercion or the use of force.

Backing this vision involves resolving disputes as quickly as possible with diplomatic efforts. Backing these principles has been the essential mission of the United States military in the Asia-Pacific for more than 60 years and it will be even a more important mission in the future. My hope is that in line with these rules and international order that is necessary that the United States will join over 160 other nations in ratifying the Law of Seas Convention this year.

The second principle is one of partnerships. Key to this approach is our effort to modernize and strengthen our alliances and partnerships in this region. The United States has key treaty alliances with Japan, South Korea, Australia, Philippines and Thailand. We have key partners in India, Singapore, Indonesia, and other nations. And we are working hard to develop and build stronger relations with China.

As we expand our partnerships, as we strengthen our alliances, the United States-Japan alliance will remain one of the cornerstones for regional security and prosperity in the 21st century. For that reason, our two militaries are enhancing their ability to train and operate together, and cooperating closely in areas such as maritime security and intelligence, surveillance and reconnaissance. We are also jointly developing high-tech capabilities, including the next generation missile defense interceptor, and exploring new areas of

cooperation in space and in cyberspace.

In the past several months we have strengthened the alliance and our broader strategic objectives in the region with a revised plan to relocate Marines from Okinawa to Guam. This plan will make the U.S. presence in Okinawa more politically sustainable, and it will help further develop Guam as a strategic hub for the United States military in the Western Pacific, improving our ability to respond to a wide range of contingencies in the Asia-Pacific region.

Another linchpin of our Asia-Pacific security is the U.S. alliance with the Republic of Korea. During a year of transition and provocation on the Korean Peninsula, this alliance has been indispensable, and I have made it a priority to strengthen it for the future. To that end, even as the United States reduces the overall size of its ground forces in the coming years in a transitional way over a five-year period, we will maintain the United States Army's significant presence in Korea. We are also boosting our intelligence and information sharing with the Republic of Korea, standing firm against hostile provocations from North Korea while transforming the alliance with new capabilities to meet global challenges.

The third shared principle is presence. While strengthening our traditional alliances in Northeast Asia and maintaining our presence there, as part of this rebalancing effort we are also enhancing our presence in Southeast Asia and in the Indian Ocean region.

A critical component of that effort is the agreement announced last fall for a rotational Marine Corps presence and aircraft deployments in northern Australia. The first detachment of Marines arrived in April, and this Marine Air-Ground Task Force will be capable of rapidly deploying across the Asia-Pacific region, thereby enabling us to work more effectively with partners in Southeast Asia and the Indian Ocean and tackle common challenges such as natural disasters and maritime security.

These Marines will conduct training and exercises throughout the region and with Australia, strengthening one of our most important alliances and building on a decade of operational experience together in Afghanistan. Speaking of that, I welcome and applaud Australia's announcement that later this year it will assume leadership of Combined Team Uruzgan, and will lead our security efforts there through 2014.

We're also continuing close operational cooperation with our longtime ally, Thailand. The Thais annually host COBRA GOLD, a world-class multilateral military exercise, and this year we will deepen our strategic cooperation to meet shared regional challenges. We are energizing our alliance with the Philippines. Last month in Washington I joined Secretary Clinton in the first-ever "2+2" meeting with our Filipino counterparts. Working together, our forces are successfully countering terrorist groups. We are also pursuing mutually beneficial capability enhancements, and working to improve the Philippine's maritime presence. Chairman
Dempsey will be traveling from here to the Philippines to further our military engagement.

Another tangible manifestation of our commitment to rebalancing is our growing defense relationship with Singapore. Our ability to operate with Singaporean forces and others in the region will grow substantially in the coming years when we implement the forward deployment of the Littoral Combat Ships to Singapore.

As we take existing alliances and partnerships in new directions, this rebalancing effort also places a premium on enhancing partnerships with Indonesia, Malaysia, India, and Vietnam, and New Zealand. In the coming days I will travel to Vietnam to advance bilateral defense cooperation, building off of the comprehensive memorandum of understanding that our two nations signed last year. From Vietnam, I will travel to India to affirm our interest in building a strong security relationship with a country I believe will play a decisive role in shaping the security and prosperity of the 21st century.

As the United States strengthens these regional partnerships, we will also seek to strengthen a very important relationship with China. We believe China is a key to being able to develop a peaceful, prosperous, and secure Asia-Pacific in the 21st century. And I am looking forward to traveling there soon at the invitation of the Chinese government. Both of our nations recognize that the relationship -- this relationship between the United States and China is one of the most important in the world. We in the

United States are clear-eyed about the challenges, make no mistake about it, but we also seek to grasp the opportunities that can come from closer cooperation and a closer relationship.

I'm personally committed to building a healthy, stable, reliable, and continuous mil-to-mil relationship with China. I had the opportunity to host Vice President Xi and later Defense Minister General Liang at the Pentagon in the effort to pursue that goal. Our aim is to continue to improve the strategic trust that we must have between our two countries, and to discuss common approaches to dealing with shared security challenges.

We are working with China to execute a robust military-to-military engagement plan for the rest of this year, and we will seek to deepen our partnership in humanitarian assistance, counter-drug, and counter-proliferation efforts. We have also agreed on the need to address responsible behavior in cyberspace and in outer space. We must establish and reinforce agreed principles of responsible behavior in these key domains.

I know that many in the region and across the world are closely watching the United States-China relationship. Some view the increased emphasis by the United States on the Asia-Pacific region as some kind of challenge to China. I reject that view entirely. Our effort to renew and intensify our involvement in Asia is fully compatible -- fully compatible -- with the development and growth of China. Indeed, increased U.S. involvement in this region will benefit China as it advances our shared security and prosperity for the future.

In this context, we strongly support the efforts that both China and Taiwan, both have made in recent years trying to improve cross-strait relations. We have an enduring interest in peace and stability across the Taiwan Strait. The United States remains firm in the adherence to a one-China policy based on the Three Communiqués and the Taiwan Relations Act. China also has a critical role to play in advancing security and prosperity by respecting the rules-based order that has served the region for six decades. The United States welcomes the rise of a strong and prosperous and successful China that plays a greater role in global affairs.

Another positive step towards furthering this rules-based order is Asia's deepening regional security architecture, which the United States strongly supports. Last October, I had the opportunity to be the first U.S. secretary of defense to meet privately with all ASEAN defense ministers in Bali. We applaud the ASEAN Defense Ministers Meeting Plus for producing real action plans for multilateral military cooperation, and I strongly support the ASEAN decision to hold more frequent ADMM-Plus discussions at the ministerial level. We think this is an important step for stability, real coordination, communication, and support between these nations.

The United States believes it is critical for regional institutions to develop mutually agreed rules of the road that protect the rights of all nations to free and open access to the seas. We support the efforts of the ASEAN countries and China to develop a binding code of conduct that would create a rules-based framework for regulating the conduct of parties in the South China Sea, including the prevention and management of disputes.
On that note, we are obviously paying close attention to the situation in Scarborough Shoal in the South China Sea. The U.S. position is clear and consistent: we call for restraint and for diplomatic resolution; we oppose provocation; we oppose coercion; and we oppose the use of force. We do not take sides when it comes to competing territorial claims, but we do want this dispute resolved peacefully and in a manner consistent with international law.

We have made our views known and very clear to our close treaty ally, the Philippines, and we have made those views clear to China and to other countries in the region. As a Pacific power, the United States has a national interest in freedom of navigation, in unimpeded economic development and commerce, and in a respect for the rule of law. Our alliances, our partnerships, and our enduring presence in this region all serve to support these important goals.

> For those who are concerned about the ability of the United States to maintain a strong presence in the Asia-Pacific region in light of the fiscal pressures we face, let me be very clear. The Department of Defense has a five-year budget plan and a detailed blueprint for implementing this strategy I just outlined for realizing our long-term goals in this region, and for still meeting our fiscal responsibilities.
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> The final principle -- shared principle that we all have is force projection. This budget is the first in what will be a sustained series of investments and strategic decisions to strengthen our military capabilities in the Asia-Pacific region. I would encourage you to look at the increasing technological capabilities of our forces as much as their numbers in judging the full measure of our security presence and our security commitment.
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> For example, over the next five years we will retire older Navy ships, but we will replace them with more than 40 far more capable and technologically advanced ships. Over the next few years we will increase the number and the size of our exercises in the Pacific. We will also increase and more widely distribute our port visits, including in the important Indian Ocean region. And by 2020 the Navy will repostur its forces from today's roughly 50/50 percent split between the Pacific and the Atlantic to about a 60/40 split between those oceans. That will include six aircraft carriers in this region, a majority of our cruisers, destroyers, Littoral Combat Ships, and submarines.
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> Our forward-deployed forces are the core of our commitment to this region and we will, as I said, sharpen the technological edge of our forces. These forces are also backed up by our ability to rapidly project military power if needed to meet our security commitments. Therefore, we are investing specifically in those kinds of capabilities -- such as an advanced fifth-generation fighter, an enhanced Virginia-class submarine, new electronic warfare and communications capabilities, and improved precision weapons -- that will provide our forces with freedom of maneuver in areas in which our access and freedom of action may be threatened.
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> We recognize the challenges of operating over the Pacific's vast distances. That is why we are investing in new aerial-refueling tankers, a new bomber, and advanced maritime patrol and anti-submarine warfare aircraft.
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> In concert with these investments in military capabilities, we are developing new concepts of operation which will enable us to better leverage the unique strengths of these platforms and meet the unique challenges of operating in Asia-Pacific. In January, the department published a Joint Operational Access Concept which, along with these related efforts like Air-Sea Battle, are helping the Department meet the challenges of new and disruptive technologies and weapons that could deny our forces access to key sea routes and key lines of communication.
>
> It will take years for these concepts and many of the investments that I just detailed, but we are making those investments in order that they be fully realized. Make no mistake -- in a steady, deliberate, and sustainable way the United States military is rebalancing and bringing an enhanced capability development to this vital region.[1]

In practice, it is still far from clear what the US posture in the Asia-Pacific will be. The US is talking about shifting its naval presence from 50% to 60% of its fleet, but it is not clear how large a fleet it will maintain in the coming years. Furthermore, the US has long fallen short of its ship-building goals. The US may well have to cut back by a carrier task force equivalent and slow its plans to modernize its submarines and equip them with more conventional long-range missiles. While it talks about focusing on the air-sea battle, it faces similar challenges in modernizing and maintaining its combat air fleet, in procuring the planned number of F-35 fighters, in actually funding and deploying a new bomber, and in modernizing key "enablers" such as its refueling tankers.

It also faces major challenges in adapting its land forces to its new strategy. An analysis by the Congressional Research Service notes that similar uncertainties exist in the future posture of the US Army:

> General Odierno reportedly envisions the Army playing an important role in the Asia-Pacific region. Noting that the Asia-Pacific region is home to 7 of the 10 largest armies in the world, General Odierno reportedly stated that the Army would "actively seek new opportunities for expanding current international training opportunities." General Odierno also emphasized how the presence of the U.S. Army in the region—about 25,800 soldiers in South Korea; 23,000 in Hawaii; 2,700 in Japan; and 13,000 in Alaska—serves as a deterrent to potential aggressors and also provides forces that can be deployed elsewhere within the region. In terms of force structure, as previously noted, the Army does not foresee any cuts to Army units in Hawaii, Japan, or South Korea. In addition, three Stryker BCTs are stationed at Joint Base Lewis-McChord in Washington that are assigned to U.S. Pacific Command and under the operational control of U.S. Army Pacific, but it is not known if these units will be reassigned to different missions.
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> Deterrence and response aside, the Army reportedly plans to step up training exercises in the region in an effort to strengthen its presence and influence. In addition to Pacific-based units, the Army reportedly is considering including the XVIII Airborne Corps at Ft. Bragg, NC; the I Corps at Joint Base Lewis-McChord, WA; and the 101st Airborne Division at Ft. Campbell, KY, in upcoming exercises. The U.S. Army Pacific is reportedly working with the 101st Airborne Division on the possibility of participating in Yudh Abhyas, a bilateral exercise with India. The United States and India would take turns hosting the exercise, with the United States hosting the exercise in 2013. The U.S. Army Pacific is also reportedly working with Australia and New Zealand, perhaps to conduct a battalion-sized event with the New Zealand Army and a brigade-sized exercise with the Australian Army. In addition to working with these armies, the United States also hopes to leverage its relationships with Indonesia, Malaysia, and Thailand in order to increase partnership opportunities with the three nations. [2]

It will probably take until 2013-2014 to determine what path the US will really pursue in Asia, what its future military spending will be, and what levels of force it will deploy over time. The key point from the perspective of US and Chinese military dialogue is that even if all current plans are implemented, the US would not carry out a major military build-up in Asia, and – as the following analysis of Chinese forces shows – would not posture its forces for a confrontation with China. This highlights the fact – as does the analysis of Chinese forces – that a military dialogue must be founded on hard, detailed analysis of the actual force trends on both sides, and not on a worst case analysis of military rhetoric.

The Trends in Chinese Military Modernization

The analysis that follows also make it clear Chinese forces and strategy do not lend themselves to easy comparisons to current and probable US forces and strategy. China is the major land power in Asia, although it is now developing major power projection capabilities. Accordingly, this report on Chinese military modernization provides a quantitative assessment of China's entire military modernization program.

The report examines a range of data regarding Chinese capabilities and force modernization, focusing on the most reliable sources. Using these sources, it analyzes the full range of China's military capabilities as well as trends in their growth and composition. Data alone, however, cannot provide a full narrative: this report places the observable data within the context of contemporary Chinese military thought and doctrine.

The data indicate that the People's Republic of China has engaged in a continuing military modernization program that is increasing the capabilities available to the People's Liberation Army (PLA). Although the PLA has consistently reduced its manpower since the 1980's,

reductions in obsolete equipment and the procurement and deployment of modern systems in its land, air, naval, and missile forces have led to increases in the PLA's overall military effectiveness, especially in the context of its Local War under Conditions of Informatization military doctrine.

Seen within the context of Chinese military doctrine, the modernization efforts in the PLA Army, Navy, Air Force, and Second Artillery Corps have enabled changes in operations and tactics as well as in force structure and weapon systems: these changes, in turn, have expanded PLA military capabilities and placed China on the road to becoming a modern military power.

Chapter 1: Assessing China's Armed Forces

For more than two decades the Chinese military has engaged in a military modernization and force development program. There exist different explanations for this modernization effort, with analysts from many countries providing explanations based on differing assumptions, international relations theories, and available data.

Perhaps the best summary of Chinese views is presented by the People's Republic of China's (PRC) national defense white papers, which are issued biennially by the Information Office of the State Council of the People's Republic of China. The most recent white papers, called *China's National Defense in 2006*, *China's National Defense in 2008*, and *China's National Defense in 2010,* provide a Chinese analysis of the logic and drivers behind the military modernization program. Importantly, the papers themselves are meant to be viewed as a series, so older versions of the white paper still provide utility for China analysts.[3] In the papers, China offers a summary of its strategic view of the world. The following passage comes from the 2010 white paper and provides the most recent official Chinese view of the modern strategic environment:

> The international situation is currently undergoing profound and complex changes. The progress toward economic globalization and a multi-polar world is irreversible, as is the advance toward informationization of society. The current trend toward peace, development and cooperation is irresistible. But, international strategic competition and contradictions are intensifying, global challenges are becoming more prominent, and security threats are becoming increasingly integrated, complex and volatile.
>
> On the whole, the world remains peaceful and stable. The international community has reaped the first fruits in joint efforts to respond to the global financial crisis. All countries have stepped up to adjust their strategies and models for economic development, and no effort has been spared in attempting to foster new economic growth points. Scientific and technological innovations are breeding new breakthroughs. And economic globalization has achieved further progress. The international balance of power is changing, most notably through the economic strength and growing international status and influence of emerging powers and developing countries. Prospects for world multi-polarization are becoming clearer. The prevailing trend is towards reform in international systems. Steady progress is being made in the establishment of mechanisms for management of the global economy and finance. G20 is playing a more outstanding role. The international spotlight has turned to the reform of the UN and other international political and security systems. Profound realignments have taken place in international relations; economic interdependence among various countries has been enhanced; shared challenges have been increasing; and communication, coordination and cooperation have become mainstream in relationships among the world's major powers. As factors conducive to maintaining peace and containing conflict continue to grow, mankind can look forward to a future that on the whole is bright.
>
> The international security situation has become more complex. International strategic competition centering on international order, comprehensive national strength and geopolitics has intensified. Contradictions continue to surface between developed and developing countries and between traditional and emerging powers, while local conflicts and regional flashpoints are a recurrent theme. In a number of countries, outbreaks of unrest are frequently triggered off by political, economic, ethnic, or religious disputes. In general, world peace remains elusive. Deep-seated contradictions and structural problems behind the international financial crisis have not been resolved. World economic recovery remains fragile and imbalanced. Security threats posed by such global challenges as terrorism, economic insecurity, climate change, nuclear proliferation, insecurity of information, natural disasters, public health concerns, and transnational crime are on the rise. Traditional security concerns blend with non-traditional ones and domestic concerns interact with international security ones, making it hard for traditional security approaches and mechanisms to respond effectively to the various security issues and challenges in the world.

> International military competition remains fierce. Major powers are stepping up the realignment of their security and military strategies, accelerating military reform, and vigorously developing new and more sophisticated military technologies. Some powers have worked out strategies for outer space, cyber space and the Polar Regions, developed means for prompt global strikes, accelerated development of missile defense systems, enhanced cyber operations capabilities to occupy new strategic commanding heights. Some developing countries maintain the push towards strengthening their armed forces, and press on with military modernization. Progress has been made in international arms control, but prevention of the proliferation of weapons of mass destruction remains complex, there is still much to do to maintain and strengthen the international non-proliferation mechanism.[4]

This view of the world bears striking similarities to the way in which China's neighbors, the United States, and many Western nations present their view of the security environment. However, outsiders can—and do—speculate on current and future Chinese intentions and capabilities: China's long-running military modernization program has caused some observers to question the reasons for such sustained investments.

At the same time, China has many reasons to modernize its security forces and expand their war-fighting capabilities. From a Chinese perspective, the other nations of the world create as many strategic uncertainties for China as China does for them. China shares borders with 15 other countries in Asia (counting Japan), several of which pose serious security issues in Chinese eyes. Taiwan, North Korea, Pakistan, and India all present challenges to regional stability. The US presence in the region is also seen as posing a further challenge in terms of strategic planning.

China has every reason to see the United States as both a major trading partner and as a potential strategic rival. As a potential world power, China's sphere of interests is going to span the entire globe. Becoming a major world power also creates strategic and military imperatives that generate a momentum of their own. In the last decade, the development of China's domestic and foreign policies has increased the country's involvement in international affairs. The rapid expansion of international trade, along with China's increased reliance on imported commodities and participation in multilateral policymaking institutions, has exposed China to risks that may increasingly jeopardize its interests abroad and at home. In addition, domestic problems in China may pose issues for internal stability.

China makes several of these points in its defense white papers. It states that China's military faces a world in which "China is … confronted by more diverse and complex security challenges" that threaten its "vast territories and territorial seas." Consequently, China "faces heavy demands in safeguarding national security" from external threats. Moreover, China's internal concerns, "the 'Taiwan independence' separatist force" and "separatist forces working for 'East Turkistan independence' and 'Tibet independence,'" continue to pose domestic challenges. In addition, the United States creates a unique issue for China, as "the United States is reinforcing its regional military alliances, and increasing its involvement in regional security affairs."[5] It also continues to sell weapons to Taiwan.

Exacerbating these challenges is the Revolution in Military Affairs (RMA) which is forcing China to face strategic challenges while adapting to a rapidly changing military environment. In addition to "fierce" military competition and vigorous development of foreign military technology, China must contend with an expansion in the number of militarized domains. The specific references to outer space, cyber space, and the polar regions in the 2010 white paper express concerns found in the 2008 version over "strategic nuclear forces, military astronautics, missile defense systems, and global and battlefield reconnaissance and surveillance."[6]

Despite these challenging world trends, China describes its own defense policy as one that does not present a threat to any other state and which upholds world peace and stability:

> China pursues a national defense policy which is defensive in nature. In accordance with the Constitution of the People's Republic of China and other relevant laws, the armed forces of China undertake the sacred duty of resisting foreign aggression, defending the motherland, and safeguarding overall social stability and the peaceful labor of its people. To build a fortified national defense and strong armed forces compatible with national security and development interests is a strategic task of China's modernization, and a common cause of the people of all ethnic groups.
>
> The pursuit of a national defense policy which is defensive in nature is determined by China's development path, its fundamental aims, its foreign policy, and its historical and cultural traditions. China unswervingly takes the road of peaceful development, strives to build a harmonious socialist society internally, and promotes the building of a harmonious world enjoying lasting peace and common prosperity externally. China unswervingly advances its reform and opening up as well as socialist modernization, making use of the peaceful international environment for its own development which in return will contribute to world peace. China unswervingly pursues an independent foreign policy of peace and promotes friendly cooperation with all countries on the basis of the Five Principles of Peaceful Coexistence. China unswervingly maintains its fine cultural traditions and its belief in valuing peace above all else, advocating the settlement of disputes through peaceful means, prudence on the issue of war, and the strategy of "attacking only after being attacked." China will never seek hegemony, nor will it adopt the approach of military expansion now or in the future, no matter how its economy develops.[7]

In order to achieve the aims of the PRC's defense policy, the PLA aims to both secure China as a sovereign state and also to further the cause of world peace. The goals and tasks of this peaceful national defense policy for the new era are defined as follows:

-- Safeguarding national sovereignty, security and interests of national development.

-- Maintaining social harmony and stability.

-- Accelerating the modernization of national defense and the armed forces.

-- Maintaining world peace and stability.[8]

To underscore its emphasis on peaceful intentions and defensive national defense modernization, the 2010 White Paper describes PRC actions and policies regarding:

China's Defense Budget

> "With the development of national economy and society, the increase of China's defense expenditure has been kept at a reasonable and appropriate level.… In recent years, the share of China's annual defense expenditure in its GDP has remained relatively steady, while that in overall state financial expenditure has been moderately decreased."[9]

China's "Self-Defensive Nuclear Strategy"[10]

> "China has always stood for the complete prohibition and thorough destruction of nuclear weapons.
>
> … As a permanent member of the UN Security Council and a nuclear-weapon state signatory of the NPT, China has never evaded its obligations in nuclear disarmament and pursues an open, transparent and responsible nuclear policy. It has adhered to the policy of no-first-use of nuclear weapons at any time and in any circumstances, and made the unequivocal commitment that under no circumstances will it use or threaten to use nuclear weapons against non-nuclear-weapon states or nuclear-weapon-free zones. China has never deployed nuclear weapons in foreign territory and has always exercised the utmost restraint in the development of nuclear weapons, and has never participated in any form of nuclear arms race, nor will it ever do so. It will limit its nuclear capabilities to the minimum level required for national security.

> … China consistently supports the efforts of non-nuclear-weapon states in establishing nuclear-weapon-free zones, has already signed and ratified all the relevant protocols which have been opened for signature of any nuclear-weapon-free zone treaties, and has reached agreement with the ASEAN countries on relevant issues under the Protocol of the Treaty on the Southeast Asia Nuclear-Weapon-Free Zone. China supports the Treaty on a Nuclear-Weapon-Free Zone in Central Asia and its protocols signed by Central Asian countries, and supports the establishment of a nuclear-weapon-free zone in the Middle East."[11]

There is, however, little practical difference between defensive force modernization and transformation and offensive force modernization and transformation. Like other modern military powers, China must now make procurement and force transformation decisions that will shape its forces for years to come. At the same time, a host of internal and external events could suddenly change the nature of these efforts or their strategic focus. Even if China has no goals or ambitions beyond those stated in its defense white paper, events and crises can force national leaders into unenviable situations and force hard decisions upon them.

This is why it is so critical to look beyond what states say and what critics suspect. There are measures of China's capabilities and actions that are based largely on hard data rather than opinion. Much is known about the current state of China's armed forces and its future plans and arms purchases. China's holdings and deployment of major weapon systems, order of battle, arms trade, and internal security matters can be measured, and those measurements can disclose many aspects of what China is doing.

While many uncertainties do exist in the data available, many official sources like government reports, yearbooks, white papers, and other official reports address Chinese security policy modernization. The International Institute for Strategic Studies (IISS) also provides extensive unclassified data on China's force structure, and other sources provide more recent numbers on defense spending and weapon system procurement. China's policy of information on military matters does make such assessments difficult in some areas and leaves considerable uncertainty in others, but a wide range of data that few experts question does exist.

This report deliberately focuses only on such data and does little more than touch on China's possible strategies and on the less tangible measures of its intentions and capabilities. It does not make assumptions about whether China's military buildup constitutes a threat to the United States or Asian nations.

These limits mean that the following descriptions and trend analyses must be kept in perspective. A quantitative description of military capabilities cannot be the sole foundation for strategic decisions. Force numbers and orders of battle cannot portray the ingenuity (or lack thereof) and morale of the people in command.

Successful tactics, the ability to make best use of resources, combat experience, and a functioning support base are some of the factors that may alter the meaning that comparisons of numbers may suggest. Security forces are a means of political decisionmaking. Their success will ultimately depend on the extent to which political leadership uses them.

At the same time, data in this analysis often portray the qualitative trends in Chinese forces and provide a better basis for understanding possible strategies and intentions. Modernization data, in particular, provide such insights where quantitative force data may not. These data are provided throughout the text of this report.

In addition, it is possible to portray key aspects of the military balance without making value judgments or guessing which given scenarios might develop. They are presented deliberately as bare data in order to avoid guesses about possible intentions and war-fighting options.

Chapter 2: Underlying Resources for China's Security Capabilities

China's high rate of economic growth, the size of its gross domestic product (GDP), and its large population are making it a major force in the global economy. The above factors have already given China the resources to become a major military power with steadily more advanced equipment and technology. A strong economic base and a well-trained workforce will bolster China's prestige in the international system and could lay the foundation for significantly increased Chinese military power.

Economic Trends

China has recorded comparatively high GDP growth rates during the past two decades and there is currently no indication that economic growth will significantly slow in the near future. In 2011, China's nominal GDP stood at $6.99 trillion (based on exchange rate) while its purchasing-power parity (PPP) GDP stood at an impressive $11.29 trillion.[12]

Moreover, China's economy is predicted to continue its robust expansion into the middle of the decade: the International Monetary Fund (IMF) predicts that China's economy will grow at rates of 8.2% and 8.8% for 2012 and 2013 respectively.[13] The Economist Intelligence Unit, taking a longer view, predicts: "economic expansion will moderate in 2012-16 to an average of 8.1% a year as net exports subtract from GDP growth."[14] Consequently, in the near term, China's economic growth will continue and China's potential to support large and advanced military forces will increase.

While the IMF's World Economic Outlook update for January 2012 predicted sustained economic problems in the euro area which would negatively affect other regions, such spill over effects are not predicted to significantly slow China's economic growth. To quote the report, "Despite a substantial downward revision of ¾ percentage point, developing Asia is still projected to grow most rapidly at 7½ percent on average during 2012–13." The World Bank's *Global Economic Prospects: Uncertainties and Vulnerabilities*, released January 2012, echoes this sentiment, stating:

> "Economic growth in China, representing about 80 percent of regional GDP, eased over the course of 2011, from 10.4 in 2010, to 9.5 percent in the third quarter of 2011, and is expected to dip further to a (still robust) 8.4 percent in 2012 as authorities continue to dampen 'overly-fast' growth in a number of economic sectors."[15]

However, it is important to also note that there still exists significant uncertainty in China's economic future. The Great Recession and the Eurozone's sovereign debt crisis could have grave implications for the East Asian region as a whole. While probable economic forecasts place the region in a positive light, the World Bank illustrates the potential economic risks facing East Asia:

"**Risks and Vulnerabilities**

For the majority of countries in the region, the health of the global economy and high-income Europe, in particular, represents the strongest risk at this time.

Trade. If the situation in Europe deteriorates sharply, global trade could fall by 5 or more percent with serious implications for the very open East Asia region.

Finance. The potential freezing up of international capital flows under emerging global conditions has increased, exposing East Asian countries, notably, China, Indonesia, Malaysia and Thailand to the possibility of market disruptions, exchange rate volatility and external financing pressures. Vulnerabilities are more acute for countries with large shares of short term and maturing debt or current account deficits.

Commodity Prices. A large number of commodity exporting countries in the region could experience revenue losses (notably oil exporters and especially raw materials producers) under a slower global growth environment.

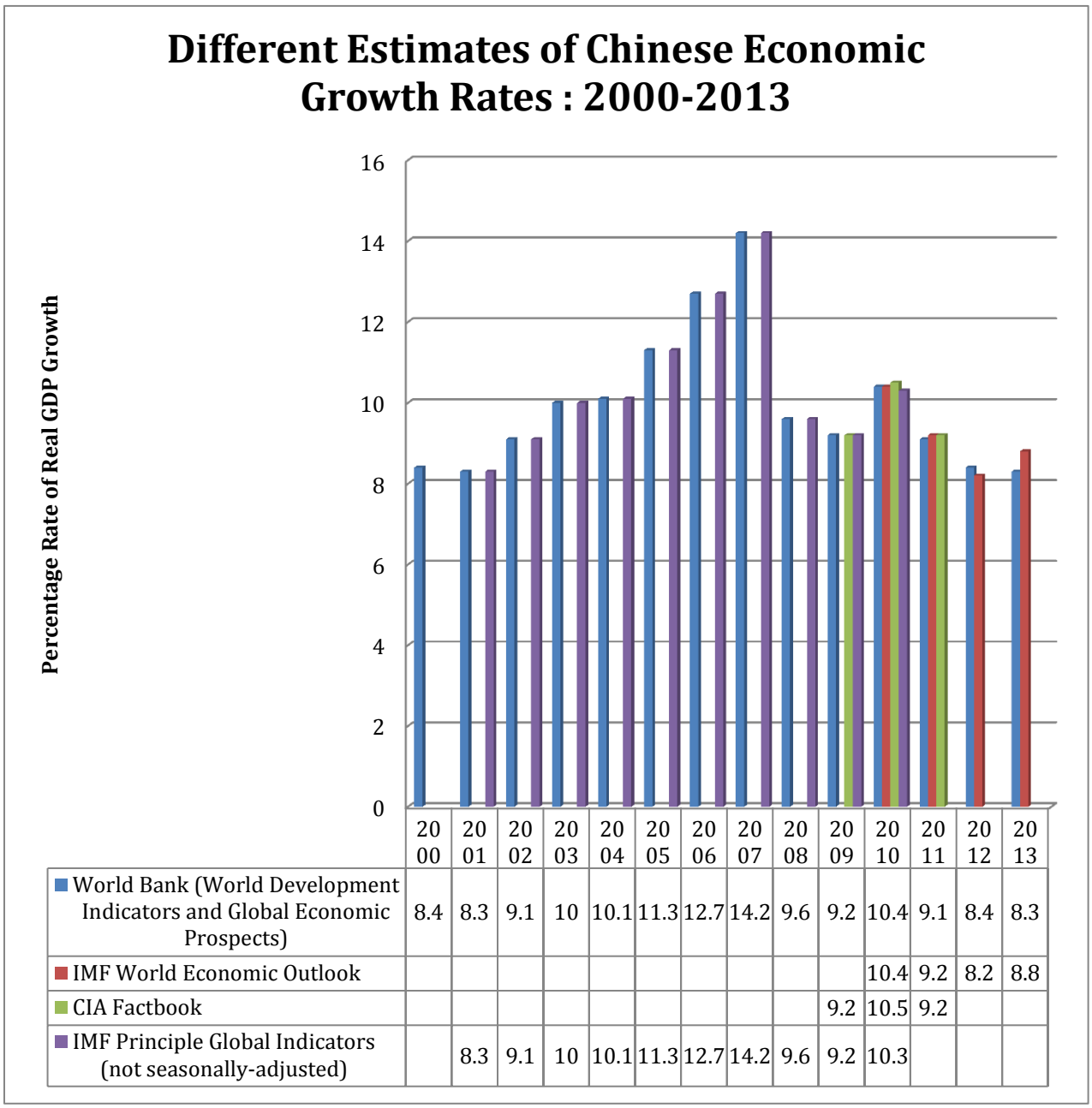
Remittances. Migrant remittance receipts are potent drivers for growth in countries, such as the Philippines and small island economies – these flows, as well as tourist arrivals could be stymied by sluggish labor market developments in the OECD and could fall sharply in the event of a global crisis.

Real Estate in China is arguably over inflated. Should the market deflate, ensuing wealth losses and loan defaults could further weaken the outlook for China."[16]

However, despite these risks, the consensus view is that China will continue enjoying robust, if not outstanding economic growth. Figures 2.1 and 2.2 below demonstrate differing estimates of China's economic performance. The key point illustrated by both Figures is the consensus, by multiple organizations, that China will continue to experience robust economic growth even if it does not experience the double-digit growth of the mid-2000's.

Figure 2.1 shows Chinese percentage growth rates from 2000 to a 2013 projection. Figure 2.2 shows the size of the Chinese economy from 2000-2011.

Figure 2.1: Different Estimates of Chinese GDP Growth Rates



	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
World Bank (World Development Indicators and Global Economic Prospects)	8.4	8.3	9.1	10	10.1	11.3	12.7	14.2	9.6	9.2	10.4	9.1	8.4	8.3
IMF World Economic Outlook											10.4	9.2	8.2	8.8
CIA Factbook										9.2	10.5	9.2		
IMF Principle Global Indicators (not seasonally-adjusted)		8.3	9.1	10	10.1	11.3	12.7	14.2	9.6	9.2	10.3			

Sources: All sources accessed March, 2012.

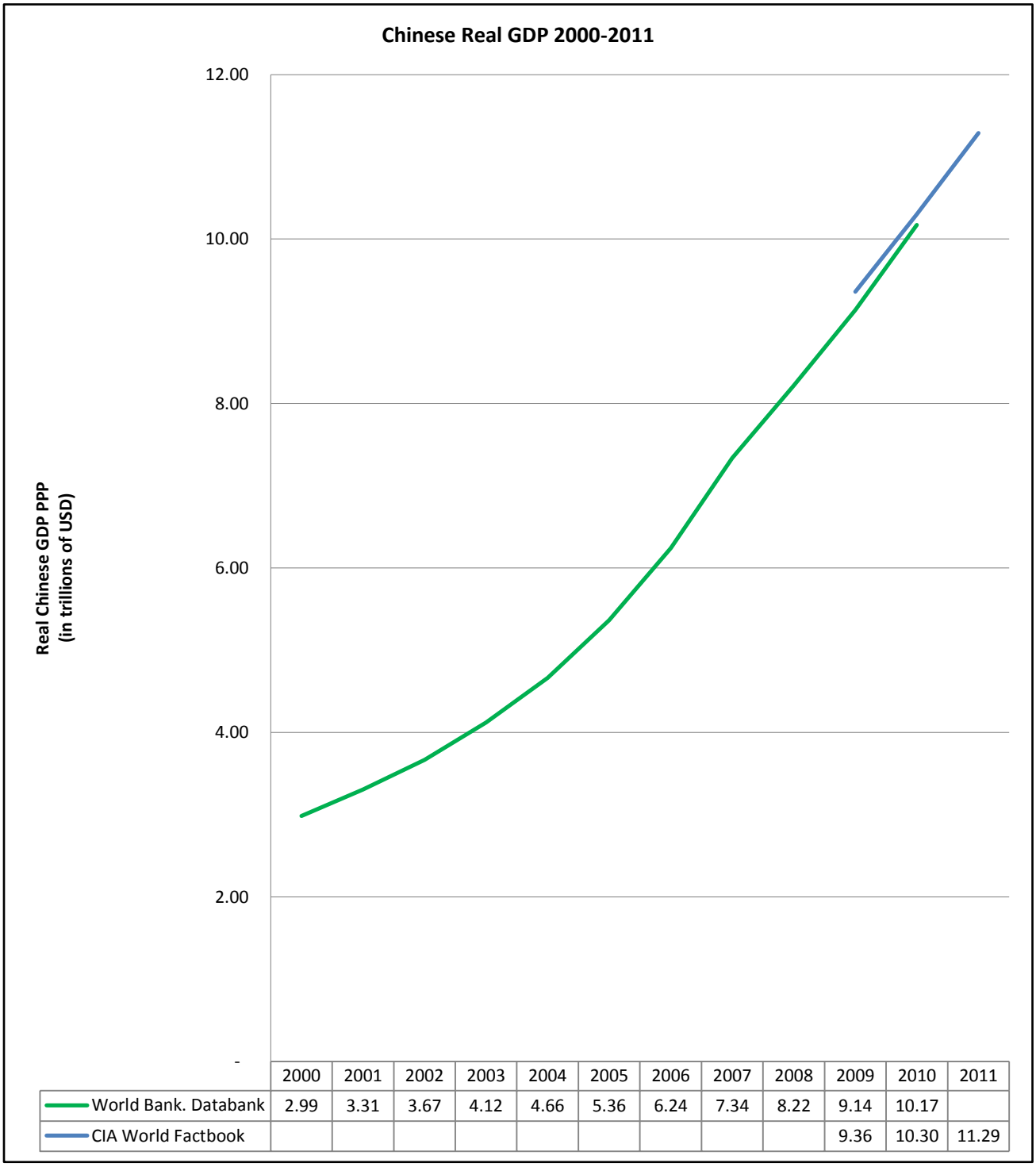
World Bank: http://data.worldbank.org/indicator

IMF World Economic Outlook: http://www.imf.org/external/pubs/ft/weo/2012/update/01/

CIA: https://www.cia.gov/library/publications/the-world-factbook/geos/ch.html

IMF Principle Global Indicators: http://www.principalglobalindicators.org/default.aspx

Figure 2.2: Different Estimates of China's PPP GDP



	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
World Bank. Databank	2.99	3.31	3.67	4.12	4.66	5.36	6.24	7.34	8.22	9.14	10.17	
CIA World Factbook										9.36	10.30	11.29

Sources: Accessed March 2012.

World Bank: http://data.worldbank.org/indicator

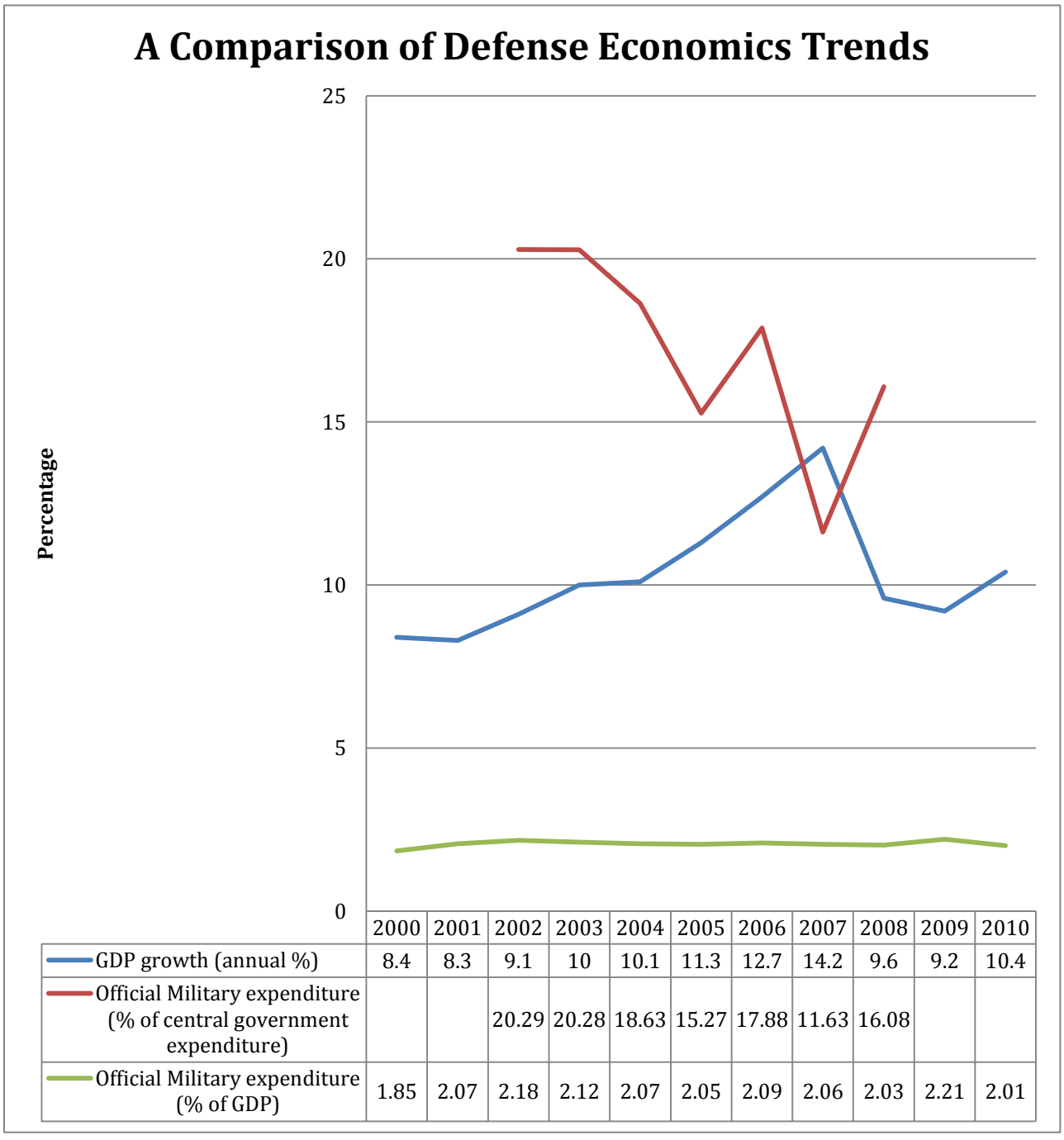
CIA: https://www.cia.gov/library/publications/the-world-factbook/geos/ch.html

Figure 2.3 shows a strong correlation between the rate of increase in GDP and a rise in official military expenditure as acceleration in GDP growth is matched by a constant defense expenditure-to-GDP ratio. These figures need to be kept in mind when interpreting the level of Chinese military spending. As the DOD states:

> "Although the military budget increases are slightly larger than the percentage increases of its overall economic growth of 10.2 percent over the same period, the actual change in the implied burden of the official defense budget on the economy appears negligible."[17]

Consequently, China's military expenditure is relatively constant when compared to national income. Many governments increase military spending in rough proportion to economic growth: they may find strategic rationales for doing so, but wealth seems to generate force development, particularly in developing nations and emerging powers.

Figure 2.3: Comparing GDP, Central Government Expenditure, and Military Spending



	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
GDP growth (annual %)	8.4	8.3	9.1	10	10.1	11.3	12.7	14.2	9.6	9.2	10.4
Official Military expenditure (% of central government expenditure)			20.29	20.28	18.63	15.27	17.88	11.63	16.08		
Official Military expenditure (% of GDP)	1.85	2.07	2.18	2.12	2.07	2.05	2.09	2.06	2.03	2.21	2.01

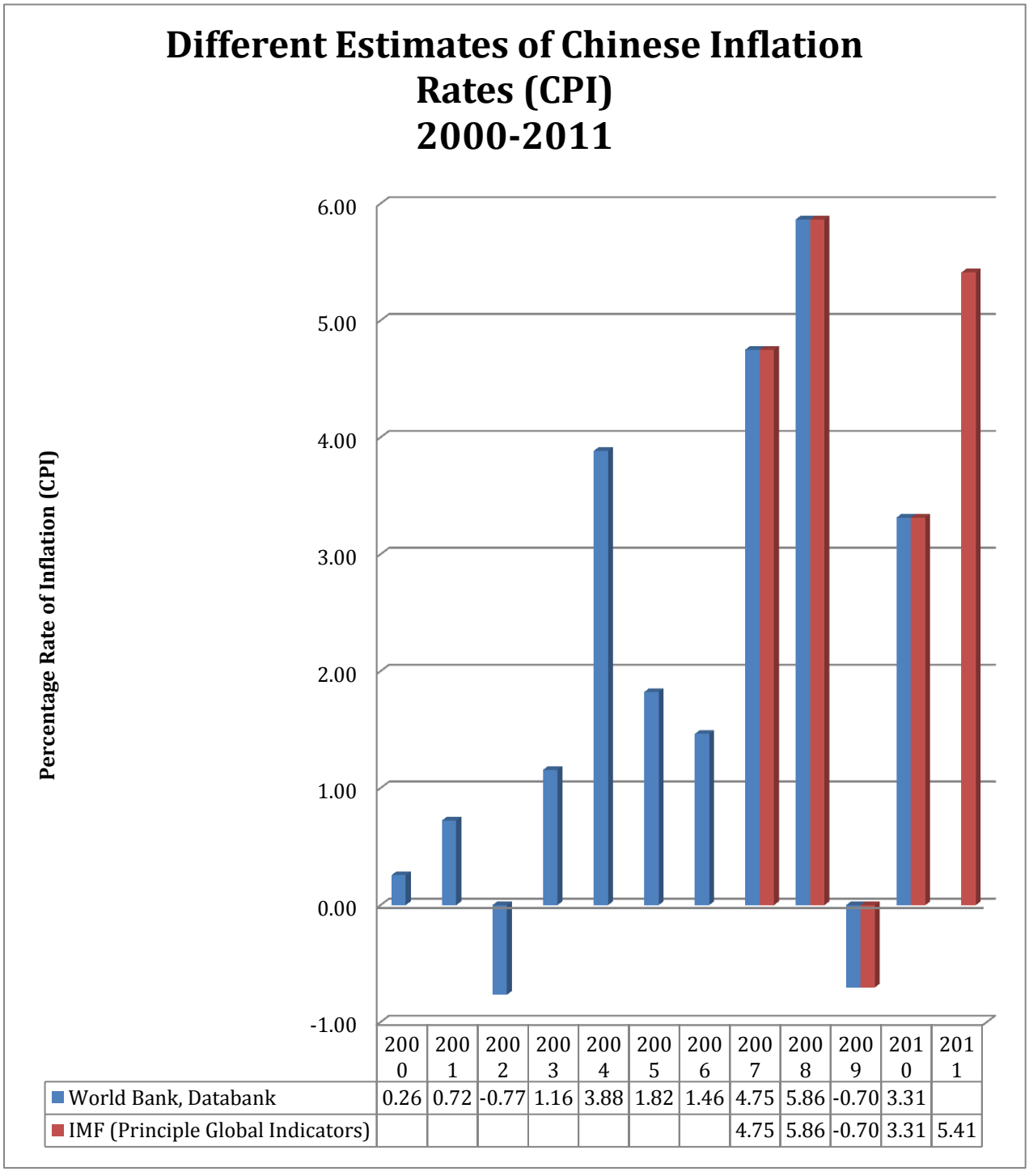
Source: The World Bank, DataBank, World Development Indicators. Accessed March 2012. http://data.worldbank.org/indicator

This tendency to consciously or unconsciously peg military expenditure to GDP magnifies the importance of trends that may augment or impede GDP growth. In the last two years, inflation rates in China have been high enough that the PRC government is taking steps to prevent "overheating." According to the CIA World Factbook, the inflation rates for 2010 and 2011 were 3.3% and 5.4%, respectively.[18] In response to these relatively high rates of inflation, PRC President Wen Jiabao announced on March 5, 2012, that the PRC would seek a relatively moderate growth rate of 7.5% in order to achieve "higher-level, higher-quality development over a longer period of time."[19] According to the World Bank's Chief Economist, Justin Yifu Lin, China lowered its growth rate because "there are some overheating in certain sectors," and "there are some inflation pressure[s]."[20]

Such trends could continue in the near term: *Xinhua* reported a statement from Zhang Ping, minister in charge of the National Development and Reform Commission and the country's top economic planner, in which he said that the government would not relax its efforts to manage inflation even though inflation trends are currently stabilizing.[21] As a result, "the Chinese government aims to keep the CPI increase to around 4 percent for 2012."[22] Consequently, inflation-control will continue to be a priority for Beijing and may act as a break on GDP growth, and thus also possibly on military expenditure.

Figure 2.4 below displays Chinese inflation rates for the years 2000 – 2011.

Figure 2.4: Different Estimates of Chinese Inflation Rates



Source: Accessed March 2012.

World Bank: http://data.worldbank.org/indicator

IMF Principle Global Indicators: http://www.principalglobalindicators.org/default.aspx

One of the most significant aids to Chinese economic development over the past decade has been the inflow of foreign direct investment (FDI; see figure 2.5). FDI reached a new record in 2011 as the country took in $116 billion.[23] However, outside estimates for China's 2012 FDI differ, as the EU, China's biggest trading partner, is currently experiencing a crisis that Goldman Sachs predicts will continue until late 2012.[24] Despite the consequences that Euro-area economic instability creates for FDI in China, the PRC Ministry of Commerce has targeted the years 2012-2015 for a four-year average of $120 billion FDI.[25]

As of 2010, approximately 47% of all FDI was invested in the manufacturing sector, with services making up a roughly equivalent amount.[26] According to PRC statistics, U.S. direct investment in China in 2011 fell by 26.07% to $2.995 billion, and accounted for roughly 2.6% of China's annual FDI total.[27] The United States lagged behind Hong Kong, Taiwan, Japan, and Singapore as the fifth-largest investor in China in 2005.[28] FDI outflows from China are smaller in comparison, but still substantial: The PRC Ministry of Commerce's figures for outward FDI in 2010 credit China with $68.81 billion in total FDI (8.63 financial and 60.18 non-financial).[29] China's fast-growing economic ties with countries in Latin America and Africa have the potential to make China a considerable investor in various regions of the world.

In light of these trends, China's current account balance has generated significant surpluses during the first decade of the 21st century. Ranked first in the world, China's 2011 current account balance stood at $280.6 billion in 2011 and accounted for roughly 4% of China's nominal GDP and 2.5% of its PPP GDP.[30] The balance of goods represents roughly half of this total—it was responsible for a surplus of $155 billion in 2011.[31] Reserves of foreign exchange and gold in China have surpassed $3 trillion, and China has indicated an interest in diversifying its portfolio by targeting corporate equity assets abroad.[32]

The exact implications of these trends for the defense sector are unclear, although they give China steadily greater resources on which to draw and have led to a sustained modernization of China's manpower and industrial base. While China's military-industrial complex almost certainly does not attract as much FDI as other industry branches, other benefits from FDI, which are hard to quantify, must be kept in mind. The Chinese government emphasizes innovation and business practices transfer (*kaifang zhengce*-policy), state-led dual-use production, and access to technology by acquisition of foreign companies. A possible result of such practices is the divergence between those defense enterprises which have "benefited from integration with a rapidly expanding civilian economy and science and technology sector, particularly elements that have access to foreign technology" and lesser performing defense companies producing goods which have "limited counterparts in the PRC civil-industrial sector."[33]

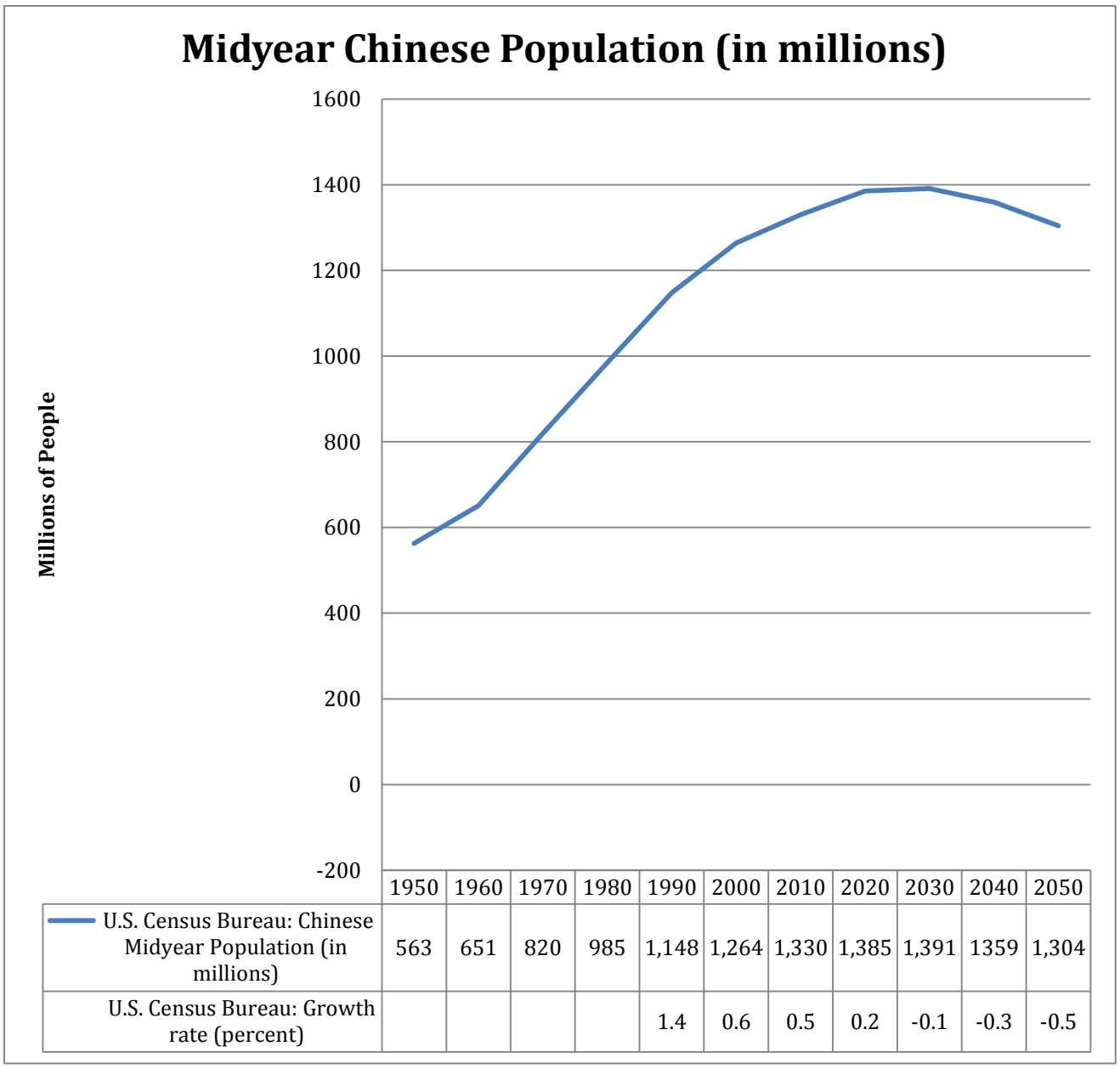
Demographic Trends

China will remain the world's most populated nation—or it will be a close second—until the end of the twenty-first century. Sheer population size will be one foundation for China's power and prestige in international affairs, although much will be determined by how the country will develop its pool of human resources.

China has been relying less and less on sheer manpower for its military strength, but demographic developments and a steadily better educated population still give it immense resources to draw upon. With approximately 1.3 billion inhabitants, China is the most populous nation on earth. India, too, probably has more than 1 billion citizens, yet the United States as the third most populous country has a mere quarter of China's population.

Chinese population growth rates have been slowing for most of the past 30 years. The official population growth rate for 2011 was 0.48%,[34] although such numbers may undercount growth in rural areas. In the absence of reliable migration data, it is difficult to estimate whether China's net population growth will be positive or negative in the years to come. However, under the assumption of negligible immigration, the US Census Bureau has created the following prediction for China's population growth. With all the caveats associated with long-term population prediction and assumptions of migration, it does predict a Chinese population which peaks around 2025 and begins shrinking afterward.

Figure 2.5: Chinese Population Projection



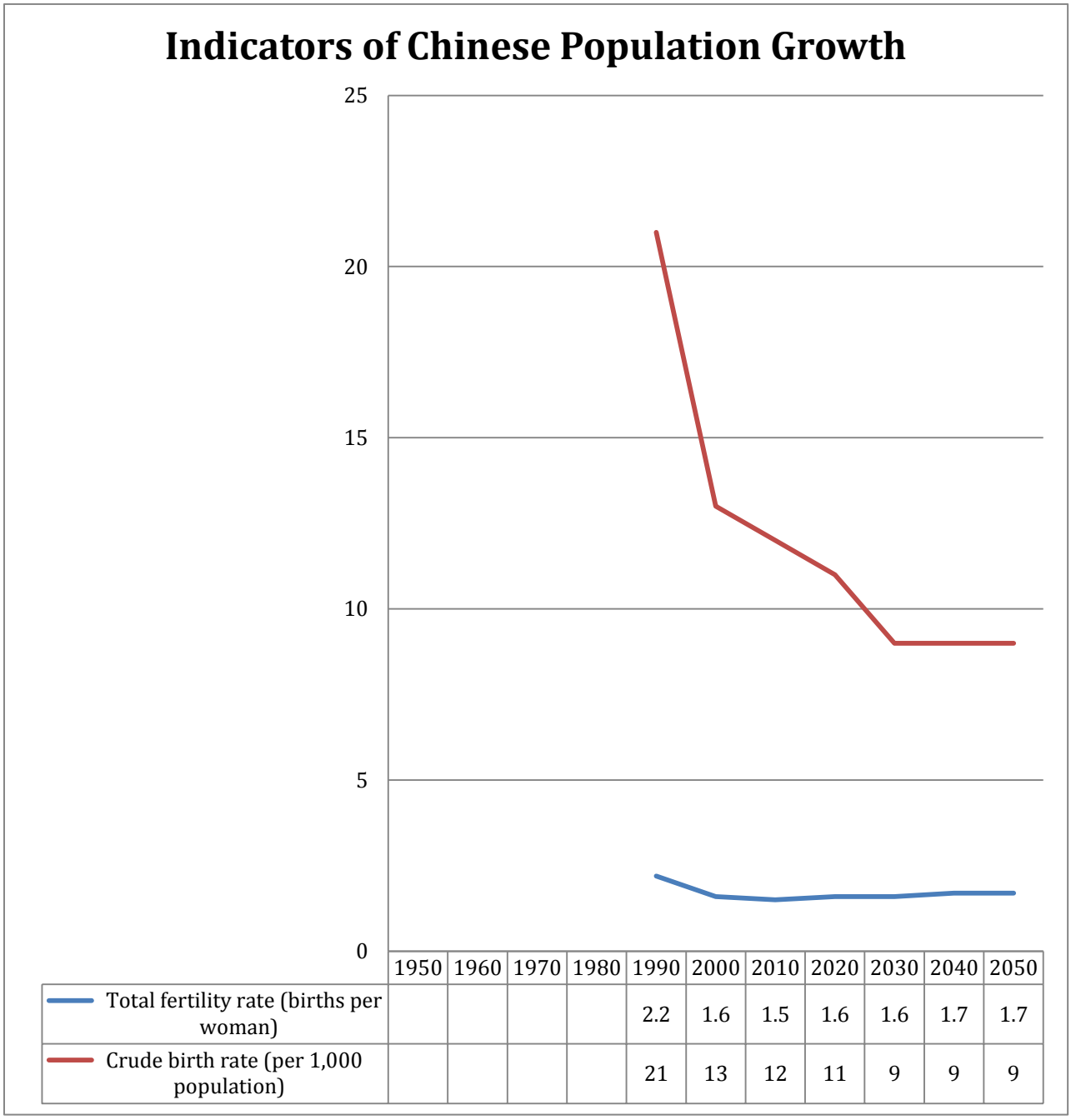
	1950	1960	1970	1980	1990	2000	2010	2020	2030	2040	2050
U.S. Census Bureau: Chinese Midyear Population (in millions)	563	651	820	985	1,148	1,264	1,330	1,385	1,391	1359	1,304
U.S. Census Bureau: Growth rate (percent)					1.4	0.6	0.5	0.2	-0.1	-0.3	-0.5

Source: US Census Bureau, International Programs, International Database. http://www.census.gov/population/international/data/idb/informationGateway.php. Accessed March 2012.

Supporting the trend depicted in Figure 2.5, birthrates in China have been steadily decreasing, standing at 12 children born per 1,000 people in 2010. Complementing this trend is a decreasing fertility rate that has reached 1.5 children per woman in the same year. At the same time, life expectancy is rising, and has reached an estimated average of 75 years for the population.[35] These trends will affect China's military manpower pool and its economy because the country will experience a significant shift in its population pyramid, moving to an age distribution with comparatively fewer young people and more elderly. In addition, some reports indicate the skewed ratio in recent years of approximately 120 males born for every 100 females will certainly contribute to slower population growth and other social ramifications.[36] According to the US Census Bureau's International Database, this trend will peak in 2030 when the number of males aged 15-39 will be 13% larger than the corresponding number of females.[37]

Figure 2.7 illustrates the birth and fertility rate trends discussed above.

Figure 2.7: Chinese Population Growth Indicators



	1950	1960	1970	1980	1990	2000	2010	2020	2030	2040	2050
Total fertility rate (births per woman)					2.2	1.6	1.5	1.6	1.6	1.7	1.7
Crude birth rate (per 1,000 population)					21	13	12	11	9	9	9

Source: US Census Bureau, International Programs, International Database. http://www.census.gov/population/international/data/idb/informationGateway.php. Accessed March 2012.

Nevertheless, population extrapolations indicate that the number of young women and men available for conscription will be more than sufficient to meet recruiting demands. This will be especially true if cuts in personnel strength of the armed forces persist or even if the number of the security forces remains steady.

The future nature of China's armed forces will also be affected by societal trends caused by population change in combination with economic transformation. The erosion of traditional social security networks in rural China already introduces difficulties for the recruitment of soldiers and absorption of veterans. Chinese armed forces will have to attract well-trained specialists and maintain a corps of noncommissioned and commissioned officers. This should be easier if Chinese overall economic development continues because more and more skilled men and women will be available to draw upon if the armed forces can project themselves as attractive employers.

If demographic and economic trends should cause a shortage of skilled labor in the future, it could mean problems for the security forces in terms of recruiting and retaining qualified personnel, especially under tight budgets. One report notes that beginning in 2017 the Chinese working-age population will begin to decline in number.[38] Such circumstances would certainly make military recruitment more difficult and limit economic growth. Furthermore, selective conscription in light of social inequalities could cause political pressure to introduce a volunteer army.

Chapter 3: PLA Military Doctrine

Significant debates continue in the Western open-source literature over China's strategy, force structure, military spending, and arms purchases. Furthermore, debates continue over China's true internal view of its strategic environment, its intentions, and the goals it is seeking to pursue.

It is therefore important to provide quantitative indicators of trends in Chinese military modernization and force development in order to better determine these key uncertainties. Necessary for this endeavor, however, are reliable sources regarding Chinese strategic doctrine: the brief summary of Chinese strategic doctrine in this chapter will be necessary to properly conceptualize the quantitative indicators presented further on in the report.

Chinese Strategic Doctrine

An analysis of the measurable trends in Chinese force development cannot touch on all the issues affecting Chinese military doctrine. It is, however, necessary to have some picture of what China says as background to any portrayal of its force strength and modernization.

What China says may not be a full reflection of what it actually thinks and intends. Certainly no Western strategy document or force plan has ever passed this test nor has generally come close to meeting it. It does, however, at least set the stage.

It is important to keep in mind the difficulties that arise from transcription, transliteration, and translation; the different cultural context; and the reality that all countries sometimes deliberately conceal the facts or use misleading terms in official documents and statements. This holds especially true when trying to infer which objectives will be assigned to the PLA.

China does not make publicly available a unified, single doctrine for guiding military operations. Rather, Chinese doctrine must be understood as the combination of several documents and guidelines at different command levels of the armed forces, united into a hierarchical system that the Chinese refer to as a "Science of Military Strategy." At the top of this hierarchy, the "Military Strategic Guidelines" provide direction on the current and future development of the PLA. The 2012 U.S. Department of Defense annual report to Congress, *Military and Security Developments Involving the People's Republic of China 2012* explains this situation, stating:

> "China's 'Military Strategic Guidelines for the New Period,' completed in 1993 and revised as recently as 2004, contains the overarching strategic and operational guidance that directs the training, development, and employment of China's armed forces."[39]

Attempts to discern a systematic hierarchy among Chinese war-fighting principles usually identify two concepts—"Active Defense" and "Local Wars under Conditions of Informatization"—at the top level of China's military doctrine. In addition, the old concept of "People's War" has been modified and updated to remain relevant in the 21st century.

Active Defense

Active defense is an operational guideline for military strategy that applies to all branches of the armed forces. It states that China's military engages in a policy of strategic defense and will only strike militarily once it has already been struck. However, Active Defense specifically states that such a defensive strategic posture is only viable if mated with an offensive operational posture. Moreover, the first strike which triggers a Chinese military response need not be military: actions

in the political and strategic realm may also justify a Chinese military reaction, even if the PLA fires the first shot tactically.[40]

The *Science of Military Strategy*, a PLA textbook on strategy, presents four pillars to active defense. First, China will not fire the first shot and will attempt to settle any disputes by peaceful means for as long as possible. Second, China will attempt to deter war militarily or politically before it breaks out. Third, China will respond to an attack with offensive action and will seek to destroy the enemy's forces. A fourth pillar, but presented as part of pillar three, is that China will not be the first state to use or threaten to use nuclear weapons.[41]

Thus, while Active Defense posits a strategically defensive orientation for the PLA, it specifically instructs the PLA to engage in operationally offensive action in order to thwart an invader. As the *Science of Military Strategy* states:

> "Strategically, we would fight only after the enemy has struck. But when foreign enemies forced war on us, we should be able to deal out powerful counterattack and stop the enemy's offense in predetermined areas. After gradually depriving the enemy of his strategic initiative, we would change strategic defensive to strategic offensive, so as to utterly defeat the enemy's invasion."[42]

Where Active Defense provides the basic strategic posture for the PLA, its concept of operations in the early 21st century is codified by the doctrine of Local War under Conditions of Informatization.

Local War under Conditions of Informatization

Since 1993, the Local War under Conditions of Informatization (Local Wars) concept has been the official military doctrine of the PLA.[1] This doctrine states that near-future warfare will be local geographically, primarily along China's periphery; limited in scope, duration, and means; and under "conditions of informatization," which the DOD describes as "conditions in which modern military forces use advanced computer systems, information technology, and communication networks to gain operational advantage over an opponent."[43] The DOD further interprets the doctrine to refer to "high-intensity, information-centric regional military operations of short duration."[44] As the rest of this study will show, the PLA's ongoing modernization and force development has occurred along the lines necessitated by this doctrine.

Like many of the PLA's theoretical concepts, this prediction of the nature of modern war is based on a combined study of history and theory: PLA theorists reportedly identify the 1991 Gulf War as the beginning of a new era in warfare, a Revolution in Military Affairs (RMA), in which information technology completely revolutionized warfare and changed the way militaries were organized, led, and fought. Moreover, the same theorists assess that the dramatic changes in international relations following the Cold War have decisively altered the both political drivers for war and the political constraints on war.[45]

The result of the RMA and the decisive change in international affairs is a new type of warfare dominated by two key characteristics: a dependence on information technology and a limitation

[1] The doctrine was originally promulgated in 1993 as "Local Warfare under High Technology Conditions" by Jiang Zemin. Hu Jintao later released his own version of the doctrine, "Local Warfare under Conditions of Informatization," to emphasize the importance of information technology. As both doctrines have similar principles, "Local Warfare under Conditions of Informatization" will be used to refer to both concepts interchangeably in order to avoid confusing the reader.

in geographic scope, duration, and political objectives of future warfare. As the *Science of Military Strategy* asserts:

> "It has two distinctive features: one is the high-tech feature, and the other is the local feature. The former refers to the high-tech as the material and technological foundation of war, for a large amount of high-tech weapons and equipment are used and a lot of traditional military systems are improved by the employment of high technologies. The latter means that the war is controlled within the local range. Moreover, the aim, range, tools of war and time and space of engagements are all limited. These two features determine the fundamental orientation of the future development of local war."[46]

With regard to the second characteristic, PLA theorists argue that in contrast to the previous PLA belief in "Total War," Local Wars are characterized by the pursuit of limited political goals through relatively constrained uses of force.[47] In this new conception, military force supports diplomatic strategies aimed at securing attainable, limited political goals rather than seeking the complete destruction of the enemy. To quote American analysts Roger Cliff *et al.*, "Military action is intended to create conditions for the achievement of the desired political outcome."[48]

Thus, military force operates in conjunction with, or possibly in support of, other instruments of national power. PLA Colonels Qiao Liang and Wang Xiangsui argue this specific point very strongly in their book, *Unrestricted Warfare*, when they assert that the effectiveness of military power has declined relative to the new, infinite means of coercing one's enemies. As they argue, the dynamically changing external environment facing nation-states today makes "obsolete the idea of confining warfare to the military domain."[49] As a result, military means are a subsidiary means of comprehensive national power and but one instrument to complement others.

Despite the decreasing potency of the purely military sphere in future conflicts, the concept of Local Wars still has much to say about the specific conditions regarding military on military confrontations. The high technology present in Local Wars ensures that wars will be brief, but highly destructive contests between military forces, both of which are linked and empowered by information technology. Because of this extreme battlefield lethality, in combination with the limited geographic scope and objectives of Local Wars, the PLA expects to fight short wars in which the first campaign will be highly destructive at the military level and lead to a decision within the military sphere quickly. Moreover, the ability of military forces to communicate and coordinate rapidly through effective C4ISR networks means that, at the operational level, military forces in Local Wars will be agile, capable of high-tempo deep operations, resource intensive, critically dependent on information, and present in all warfare domains.[50]

People's War

People's War is often wrongly confused with guerilla warfare. The Chinese concept of People's War is one in which the people actively support the military during times of warfare: this active support can be logistical, political, or operational. When describing arming the civilian population for military operations, PLA writings mostly refer to militia, civil defense, and reserve forces.[51] However, the use of civilian material and personnel for support and logistics functions is still accepted in PLA doctrine and is still seen as necessary for victory in Local Wars:

> The cooperation between the regular warfare and irregular warfare stresses that we should give full play to the creativity of the masses and servicemen on the basis of inheriting the glorious tradition of the people's war so that the new form of the people's war under modern conditions can be explored according to the

> reality of the war in different strategic directions. "Five combinations" should be dealt with well. The first is the combination of the regular troops with the masses participating in the war. The emphasis should be put on coastal regions or inland border regions. The masses should be mobilized to support defensive operations on the sea or counterattack in self-defense on the borders, and make use of local scientific and technical resources to launch all kinds of attacks against the enemy and provide various special supports.[52]

The PLA sees no contradiction between People's War and Local Wars. Rather, the PLA sees the two doctrines as mutually reinforcing.[53] Moreover, this belief in complementarity is far more than purely theoretical: the PLA actively depends on the civilian population at all strategic levels, requiring the active logistical support and, at times, operational support, of the Chinese people for mobilization, mobility, and combat. For example, a key role of local governments in wartime is to coordinate civilian support for military forces. Referencing transportation during wartime, the *Science of Second Artillery Campaigns* states:

> With respect to engineering support, on one hand the destruction during wartime of the positions, roads, bridges within the battlefield would greatly magnify the work load and difficulty; while on the other hand, the magnanimous support and assistance from the local government and the masses would become a potent replenishment of our wartime engineering support. Moreover, within the battle zone, the financial potential, mechanical maintenance capability, loading and unloading transportation capability, medical first-aid ability, in addition to the quantity and quality of the population, would all constitute extremely direct influence towards the logistics, equipment technical support and personnel replenishment.[54]

Consequently, the PLA identifies the Chinese population and local governments as vital resources during Local Wars. Given the predicted close proximity of China to future battlefields, as well as the necessary mobilization and maneuver that would take place within China, the PLA predicts that the local population can be decisive even in a local, high-technology war.

A key element of People's War is the necessity of maintaining good relations with the local populace. As a result, the *Science of Second Artillery Campaigns* specifically instructs SAC personnel to maintain good relations with the local populace for ethical and operational reasons:

> Vigorously foster the PLA's good tradition of supporting the government and cherishing the people, and foster military-politics and military-civilian relationships. Under the premise of strict adherence to secrecy, obtain contact with pertinent departments of the local government in a timely manner, and actively seek the vigorous support of the regional government. Under the condition of satisfying campaign operations, strive to accommodate the masses by self-consciously safeguarding the masses' interests. Strictly abide by policy regulations and the masses discipline, resolve new issues that surface during the process of campaigns in a timely manner, and establish the fine image of a mighty and civilized army.[55]

Chinese Campaign Doctrine

Active Defense, Local Wars, and People's War describe how China intends to posture itself, develop its forces, and fight at the strategic level. Operationally, or in the Chinese terminology, at the campaign level, the PLA has developed doctrines and principles of warfare that it believes will enable China to win Local Wars in the early 21st century, even against technologically superior adversaries. While every element of PLA campaign doctrine cannot be quickly discussed, the campaign doctrines most necessary for evaluating Chinese modernization are included below.

Integrated Joint Operations

Chinese military writings describe joint operations as a critical component of future military operations and a necessary means of defeating technologically superior adversaries. PLA doctrine holds that joint operations, or cooperation at the operational level between multiple

services, are an essential means of augmenting combat power at the operational level and a necessary means for obtaining victory in Local Wars. Identifying future combat as a confrontation between military systems, the PLA believes that synergies obtained by multi-service cooperation, such as the use of SAC forces at the operational level to further PLAAF operations, create synergies that enable the PLA to achieve its objectives in a highly complex and lethal environment.

> Under the high-tech conditions, the victory of war depends on the comprehensive confrontation capacity of the whole combat system. The composition of war power is developing in the direction of systematization, and the emphasis is laid on the combination of various forces so as to find new ways to increase their combat effectiveness through the integrated composition and employment of combat forces. The operations of individual service is disappearing, while the traditional division of labor among the Army, the Navy and the Air Force is blurring. Various combat forces are more closely connected with each other, and the operations are highly integrated. A very small-scale operation possesses the feature of jointness. The enormous power of various combat forces can only be given full play to in joint operations. Integrated and joint operation has become the basic pattern of high-tech local war. The principles of "systems confrontation" and "overall strike" have become more important than that of "independent operation". Sometimes strategic means might be used to attack tactical targets, and, sometimes, tactical means might be employed to attack strategic targets. Supported by information technology, various arms and services, different functional formations and various combat factors are woven into a unity. Hence, joint operation has become the inexorable operational pattern. Combined fighting capacity has become the fundamental symbol of combat effectiveness of the armed forces.[56]

Traditionally, the PLA considered joint operations to be "operations under unified command and executed by two or more services at the level of the corps."[57] However, in the last decade, the PLA has made two revisions to its joint operations concept. First, the PLA has renamed joint operations, "integrated joint operations," partially in response to lackluster training practices that did not achieve the hoped-for level of jointness but also in order to emphasize the role of support, logistical, and civilian forces in the joint operations concept. The new concept also emphasizes the role of informatization in joint operations.[58]

Second, the PLA has begun the process of pushing joint operations down from the level of corps (Group Armies [GA's]) to that of divisions and even brigades.[59] As the above quote shows, the PLA intends to push down joint operations to "very small-scale operations." However, as one analyst writes:

> "It is evident that conducting joint operations at division level and below is still a relatively new concept for the PLA and that more time is necessary for them to experiment, encounter problems, find solutions, and communicate these experiences throughout the PLA."[60]

Information Warfare

One of the main principles of the Local Wars concept is that Information Warfare (IW) will play a central role in future warfare. Within the realm of IW, the PLA must be capable of quickly seizing and retaining information supremacy, or the ability to access and process information in effective C4ISR[2] networks while denying the enemy the same ability. Consequently, the PLA believes that advantages in collecting, transmitting, and processing information will lead to significant advantages at the operational and even strategic level. As the 2011 DOD Report states:

[2] Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance (C4ISR)

> "PRC military writings highlight the seizure of electromagnetic dominance in the early phases of a campaign as among the foremost tasks to ensure battlefield success. PLA theorists have coined the term 'integrated network electronic warfare' (*wangdian yitizhan*—网电一体战) to describe the use of electronic warfare, computer network operations, and kinetic strikes to disrupt battlefield information systems that support an adversary's warfighting and power projection capabilities. PLA writings identify 'integrated network electronic warfare as one of the basic forms of' integrated joint operations, suggesting the centrality of seizing and dominating the electromagnetic spectrum in PLA campaign theory."[61]

The PLA has developed the Integrated Network and Electronic Warfare (INEW) doctrine to organize and structure its forces for seizing information supremacy. INEW calls for the immediate seizure of information supremacy at the beginning of a conflict or even before. According to INEW, the goal of IW forces is:

> "Controlling the dominant position in battlefield information within the scope of a particular time and space…. It means having the rights of freedom and initiative when using information and controlling the battlefield initiative…."[62]

INEW holds that this objective can only be obtained by integrating means across the services. As a doctrine, INEW specifically focuses on integrating cyber and electronic warfare forces. However, other PLA forces will be used in conjunction with cyber/electronic attacks to create a hard/soft kill mix of attacking forces: PLA theorists argue that close coordination of operational systems provides the only means for victory in the system-on-system confrontation expected during a fight for information supremacy.[63]

Some reports see the focus on information warfare as an element of "people's war." Chinese military writers reportedly envision the mobilization of millions of citizens skilled in IT applications as the heroes in a new online "people's war."[64] Some military districts have already established reserve and militia units specializing in information warfare, thereby drawing on the vast, untapped potential of civilian software experts. As many as 20 city departments are believed to have information warfare regiments among their military reserve forces.[65]

The 2006 DOD report points out that China's increasing use of IT means that civilian computer hackers *may* support the PLA in protecting Chinese networks while disrupting those of the enemy. Moreover, it reports that a PLA cyber-warfare exercise was conducted in 2005. The later 2011 DOD Report takes a more firm position, stating that such a linkage does exist:

> "These [information warfare] units include elements of the militia, creating a linkage between PLA network operators and China's civilian information technology professionals."[66]

Integrated Firepower Operations

PLA doctrine states that integrated firepower comes from artillery, air forces, and missile strikes, and is supported by IW operations. As technology has improved, the PLA has identified four characteristics of modern firepower:

> It is capable of attacking the enemy simultaneously at all depths on the battlefield.
>
> It can be used at any phase of the campaign.
>
> It can be highly effective (i.e. accurate) allowing for fewer platforms (aircraft, ships, artillery tubes, etc.) to deliver fewer munitions to achieve results faster and with fewer civilian casualties than in previous wars.
>
> It can be delivered in a joint manner by a diverse set of weapon systems from all the services appropriate to the type of target.[67]

The PLA believes that modern weapons are more accurate than previous "dumb" weapons and that, as a result, fewer munitions are needed. Nevertheless, the PLA expects to expend large quantities of precision-guided munitions in the event of conflict.[68]

Mobility

PLA doctrine envisions campaign mobility as its basic method of defeating forces that may be technologically superior to its own. Through the use of agile maneuvering and clever operational deception, the PLA hopes to achieve local superiorities of force and defeat an otherwise stronger adversary. In addition, astute maneuvering enables the PLA to disrupt an adversary while avoiding an enemy's strong points.

The PLA expects that both sides in a military confrontation will seek to increase the range and ease of their own movements while impeding the ability of the enemy to do the same.[69] Advantages at the campaign level will be seized by the side which manages to secure relative freedom of movement. As the *Science of Campaigns* states:

> In a modern campaign, the confrontation between maneuver and counter-maneuver will be extraordinarily intense. On the one hand, because maneuver is growing in significance for seizing campaign victory, counter-maneuver operations on the battlefield will receive a high level of attention. Counter-maneuver operations can delay the speed of an opponent's advance, disrupt their operational plans, kill their effective strengths, and weaken the sharp momentum of their attack. Highly effective counter-maneuver operations can even directly alter the force strength ratio between ours and their sides, and gain battlefield initiative. Thus, counter-maneuver operations are critical for winning a victory in a modern campaign. On the other hand, campaign maneuver under modern conditions will be implemented on a battlefield of unprecedented "transparency," and concealing the intention and activities of maneuver will be very difficult. At the same time, the means of modern operations and strikes will increase and firepower system assault will have high precision, long range, and large lethality. This will result in maneuver to encounter at any time an opponent's strikes and damage from the battlefield spaces such as air, ground, water surface (underwater) and various operational means. Hence, in a modern campaign, as both sides engaging in battle strive for and maintain battlefield initiative, not only must they implement initiative and flexible campaign maneuver, they must also adopt active and effective measures to oppose the counter- maneuver activities of the enemy. Maneuver and counter-maneuver have already become an important content of modern campaign confrontation and the struggle between maneuver and counter-maneuver will very intense.[70]

Importantly, one of the means identified by the PLA for achieving campaign mobility is vertical envelopment, either by parachute, helicopter, or aircraft.[71] Vertical envelopment has been practiced in PLA exercises, most recently in Peace Mission 2012, a Shanghai Cooperation Organization (SCO) military exercise that took place in June 2012.[72] This development is significant because, while the PLA has an entire airborne corps, it lacks significant air-mobile units. As a result, this doctrinal focus on vertical envelopment may precede the introduction of large-scale air-mobile formations by the PLA ground forces.

Comprehensive Support

Comprehensive support includes operational, logistics, and armament support. Several principles are central to comprehensive support. First, the PLA intends to take advantage of "People's War" and utilize the potential of the civilian population's support capabilities. Second, support forces should be under a unified command and should give primacy to the primary combat mission. Third, support forces comprise organic forces, reinforcing forces (from higher echelons), and mobilized civilian forces. Lastly, defense of support elements is vital to the campaign as they will be targeted by adversary forces.[73]

Utilizing these principles, the PLA has developed a single support system based on the Military Regions (MR's). Joint Logistics Sub-Departments (JLSD's) in each Military Region (MR) deploy during times of war to war zones and set up ad-hoc "logistics support brigades" using military and civilian personnel and material resources. As part of this system, support services will be pushed as far forward as possible and will be given "on the spot" as much as possible.[74]

Service Strategy

The PLAN, PLAAF, and SAC each have their own doctrinal concept of how they plan to achieve their objectives within the context of the PLA's shift to the Local Wars doctrine. The development of modern warfare since the 1980's has convinced the PLA that the PLAN, PLAAF, and SAC are capable of achieving strategic objectives independently and that their strength will be a key indicator of overall PLA combat power. Consequently, the PLAN, PLAAF, and SAC have developed independent doctrines on how each service and branch will modernize, develop its forces, and fight. As the *Science of Military Strategy* states:

> Beneath the military strategy is China's service strategy. It comes up following the development of Chinese army from a single service to the armed forces of modern combined services and arms to meet requirements of modern war. China's navy and air force shoulder the important missions [of safeguarding] the security of China's territorial waters and territorial air [space] and protect China's maritime rights and interests. In modern war especially high-tech local war, the strategic status and effects of [the] navy and air force are improving day by day [the capabilities ….]. [The] opportunity for [the] navy and air force to independently accomplish strategic tasks is increasing, and there are objective requirements at [the] strategic level to plan sea and air operations and [the] construction of [a] navy and air force. Accordingly under [the] unified guidance of China's military strategy of active defense, China's navy and air force need to establish the naval strategy of offshore defense and the air force strategy of offensive air defense. As one of the five nuclear power universally acknowledged, the nuclear force is [part of] China's important strategic means.
>
> The nuclear weapons of mass destruction will directly serve not only the purpose of securing the objectives of military strategy but also that of national strategy. This [allows] China's nuclear strategy of effective deterrence [to] have independent status in China's strategic structure, and concurrently have the characteristics of China's national strategy, military strategy, and service strategy, a triad of special strategic pattern.[75]

Accordingly, the PLAN operates under a doctrine of "Near Seas" or "Offshore Defense" in which the PLAN prepares for combat beyond the coasts of China out towards the first island chain.[76] The PLAAF operates under a doctrine of "Integrated Air and Space Operations, Being Prepared for Simultaneous Offensive and Defensive Operations" which calls for the PLAAF to be capable, not only of defending China from long-range attacks, but also of long-range strikes and power projection operations.[77] The SAC operates under the doctrine of "Dual Deterrence, Dual Operations," which demands that the SAC be capable of long-range conventional strike missions *and* nuclear counter-attack missions, both under conditions of nuclear deterrence.[78] A more detailed discussion of these service strategies will be presented in later chapters in the context of each service and branch's individual modernization and force development trends.

Chapter 4: Chinese Military Organization

Organization of the Chinese Security Forces

The Chinese armed forces are but one component of the overall Chinese security apparatus: overall security responsibilities are shared among the Ministry for State Security, the Ministry for Public Security, the People's Armed Police (PAP), and the PLA. All of these organizations perform different functions although the greatest burden in an armed conflict against a foreign power will naturally lie with the PLA.

Ministry for State Security (MSS)

The Ministry for State Security serves under the PRC's State Council and conducts foreign as well as domestic intelligence. Its agents perform covert activities, both inside and outside of China. Moreover, it combines domestic counter-intelligence work with foreign intelligence collection.[79]

Ministry for Public Security (MPS)

Responsibility for internal security falls to the Ministry for Public Security, which is also under the State Council. It is the highest administrative body for Chinese law enforcement forces and oversees approximately 1.9 million police personnel who are spread throughout China. These police forces have "many functions including domestic patrol, traffic control, detective, anti-crime, anti-riot, and anti-terrorism."[80] In 2001, the MPS ordered major cities to establish an anti-riot force of no fewer than 300 personnel, many of which are equipped with armored cars and armored personnel carriers.[81]

People's Armed Police (PAP)

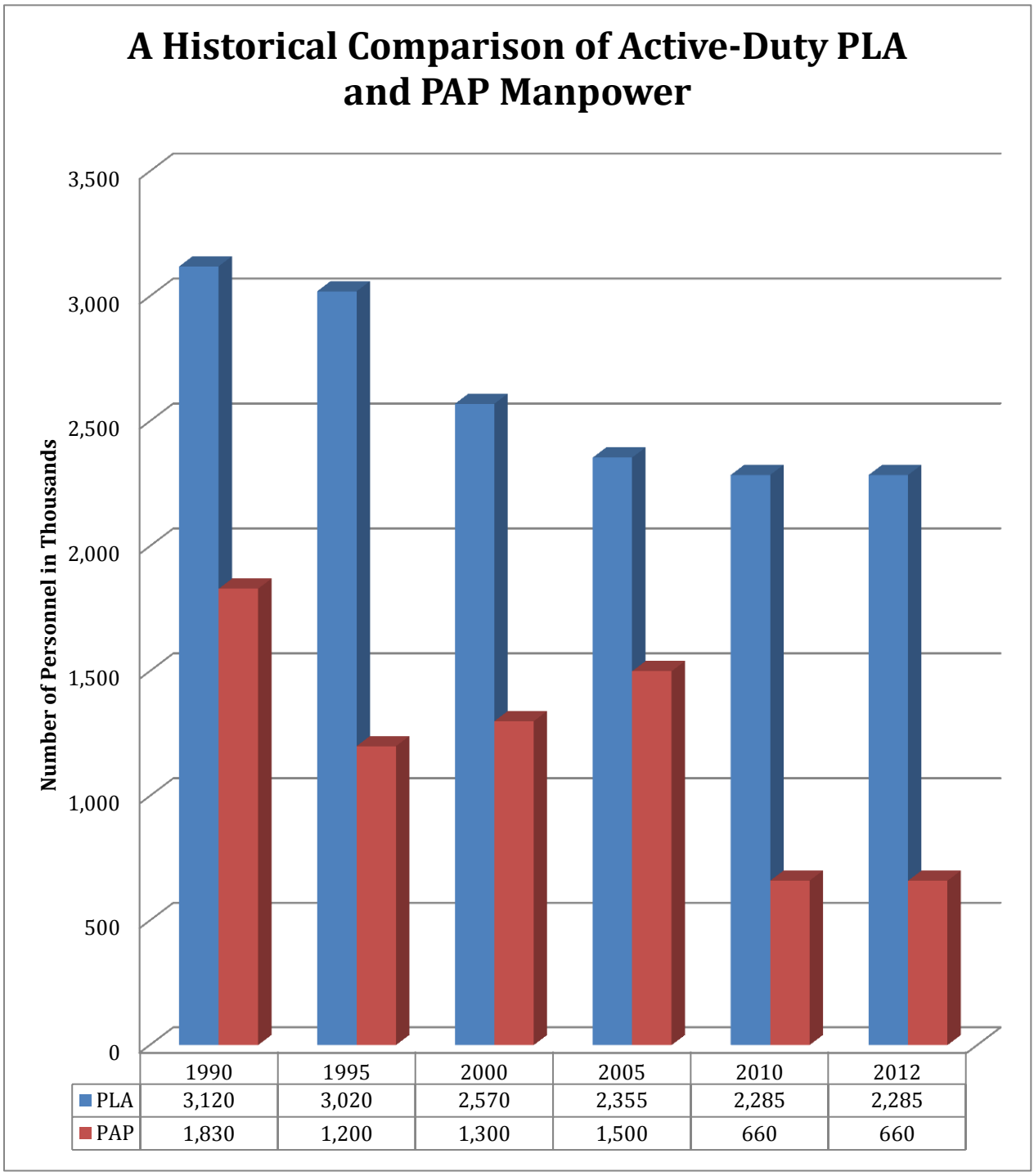
The PAP serves under the command of the Central Military Commission (CMC) and the State Council, but it is by definition not part of the PLA.[82] It serves as an internal security force, and has been described by the 2010 White Paper as the "shock force in handling public emergencies."[83] In addition, it acts as a light infantry reserve in the event of war, and also takes part in reconstruction and rescue efforts after national emergencies.[84] The PAP's 660,000+ personnel are spread between the Internal Security Forces, the Border Defense Force (including Coast Guard), the China Marine Surveillance agency, the Maritime Safety Administration, and the Fisheries Enforcement Command. Some PAP units are responsible for border security and for guarding critical infrastructure,[85] including critical military infrastructure.[86] In addition, China's 2010 White Paper states that the PAP shares some territorial air defense duties with the PLAAF, PLAN, and PLA ground forces.[87]

People's Liberation Army (PLA)

The PLA comprises China's main armed forces and can best be defined through its chain of command. All military units exclusively under the authority of the CMC are part of the PLA. Although it is called People's Liberation *Army,* the PLA consists of three services and an independent branch—the PLA army (PLAA), the PLA navy (PLAN), PLA air force (PLAAF), and the PLA Second Artillery Corps.

Figure 4.1 below compares the historical manpower of the PLA and PAP.

Figure 4.1: Historical Trends in Absolute PLA and PAP Manpower



Source: IISS, *Military Balance* 1985-2012

PLA Military Organization

China's strategic doctrine describes how China's armed forces will fight in the 21st century. However, it is necessary to examine the organizational structure of the PLA, as well as summarize the effects of institutional modernization, in order to provide a more detailed picture of the PLA's ability to fight as its doctrine demands as well as to understand the changes in each individual service's force structure.

China's High Command Structure

China officially described its overall command structure and military decision-making process in its 2006 defense white paper:

> "The state exercises unified leadership over national defense activities. China's armed forces are under the leadership of the Communist Party of China (CPC). The Central Military Commission (CMC) of the CPC and that of the People's Republic of China (PRC) are completely the same in their composition and in their function of exercising leadership over the armed forces. The CMC chairman has overall responsibility for its work.
>
> The National People's Congress (NPC) elects the chairman of the CMC of the PRC and, upon nomination by the chairman, decides on the choice of all other members of the CMC. The NPC decides on war and peace and exercises other functions and powers relating to national defense as prescribed by the Constitution. When the NPC is in recess, its Standing Committee decides on the proclamation of a state of war, decides on the general or partial mobilization of the country, and exercises other functions and powers relating to national defense as prescribed by the Constitution.
>
> The president of the PRC, in pursuance of the decisions of the NPC and its Standing Committee, may proclaim a state of war, issue mobilization orders, and exercise other functions and powers relating to national defense as prescribed by the Constitution.
>
> The State Council directs and administers national defense building in the following areas: making national defense development programs and plans, formulating principles, policies and administrative regulations for defense building, administering defense expenditure and assets, directing and administering national defense scientific research and production, directing and administering work related to mobilization of the national economy, mobilization of people's armed forces, people's air defense and national defense traffic, directing and administering the work of supporting the military and giving preferential treatment to families of servicemen and martyrs, as well as the resettlement of servicemen discharged from active service. It also directs national defense education and, jointly with the CMC, the building of the Chinese People's Armed Police Force (PAPF) and the militia, the work concerning enlistment and reserve service, and the administration of border, coastal and air defenses, and exercises other functions and powers relating to national defense building as prescribed by law.
>
> Under the State Council are the Ministry of National Defense (MND) and other departments concerning national defense building. The CMC directs and exercises unified command of China's armed forces. It has the following functions and powers: deciding on the military strategy and operational guidelines of the armed forces, directing and administering the building of the PLA, submitting proposals related to national defense to the NPC or its Standing Committee, formulating military regulations, issuing decisions and orders, deciding on the structure and organization of the PLA, appointing and removing, training, evaluating, and rewarding and punishing members of the armed forces, approving systems and development programs and plans for weaponry and equipment, and exercising other functions and powers as prescribed by law."[88]

As the white paper makes clear, the Central Military Commission (CMC) stands at the top of China's military chain of command. The CMC plays the decisive role in planning and decision-making for military-security policy and in all issues related to the armed forces. Since 1982, the CMC has been the most senior decision-making body for military affairs and armed forces in

China. The CMC is a body directly derived from the Central Committee of the CCP, thereby subjecting the Chinese armed forces to party control.

The chairman of the state CMC—currently China's president, Hu Jintao—is the commander in chief of all Chinese forces. The responsibility of the CMC encompasses operational command over all of China's armed forces and its branches, military doctrine development, logistics, and civil-military relations.

In practice, two CMCs—one for the party, one for the state—exist next to each other, but they are almost identical. The National People's Congress elects the state commission's 11 members; the Central Committee of the CCP elects the party commission.[89] The existence of two parallel CMCs shows that the PLA and the armed forces play a twin role in the Chinese body politic—the CMC, and therefore the PLA, on the one hand is an integral part of the CCP and on the other hand serves as the highest administrative body for the Chinese state's military. Both CMCs have the same membership structure; the most important difference between the two is the existence of the General Office in the party CMC. The General Office facilitates and manages interaction among China's most senior military leaders.

Organization of the PLA

The CMC maintains overall command and control over the armed forces through four general departments (GDs): the General Staff Department (GSD), the General Political Department (GPD), the General Logistics Department (GLD), and the General Armament Department (GAD). The GDs are the bureaucratic units that combine military planning and command in lieu of a ministry of defense. Each performs several distinct functions:

- **GSD.** Responsible for all staff and personnel decisions regarding the entire PLA. Its primary mission is to execute and oversee defense policy vis-à-vis the armed forces and serve as the general command for the PLA. The GSD also holds the General Staff organization for the PLA ground forces. The GSD's second department is responsible for foreign military intelligence. During wartime, the GSD leads the entire PLA under its unified command.
- **GPD.** Oversees the implementation of the political doctrine into the armed forces and ensures political loyalty, high morale, and tight discipline among members of the PLA.
- **GLD.** Organizes supply and transport services within the armed forces and provide services like housing and medical treatment to the armed forces.
- **GAD.** Manages all weapons and equipment testing, procurement, and maintenance. This includes almost exclusive oversight of the production and stockpiles of nuclear weapons.

The 2006 White Paper describes the organization and command structure of these forces as follows:

> "The PLA's General Staff Headquarters, General Political Department, General Logistics Department and General Armaments Department are departments of the CMC respectively responsible for military, political, logistical and equipment work.
>
> The General Staff Headquarters organizes and directs the development of China's armed forces, and organizes and commands their military operations. Under it are departments in charge of operations, intelligence, communications, military training and arms, adjutant and force structure, mobilization, electronic countermeasures, Army aviation, foreign affairs, etc. Its main functions and powers are to put

forward proposals on major issues of military building and operations, organize and exercise strategic command, formulate programs, rules and regulations for military work, and organize and direct war preparations, as well as military training and mobilization.

The General Political Department administers the armed forces' Party work, and organizes their political work. Under it are departments in charge of Party affairs, personnel, publicity, security, discipline inspection, civil-military affairs, etc. Its main responsibilities are to ensure the armed forces' compliance with and implementation of the lines, principles and policies of the Party and the Constitution and laws of the state, draw up general and specific policies for political work, formulate rules and regulations for political work, and make arrangements for, supervise and provide guidance to the political work of the armed forces.

The General Logistics Department administers the logistical work of the armed forces. Under it are departments in charge of financial matters, quartermaster materials and petroleum, oils and lubricants, health administration, military transportation, capital construction and barracks, auditing, etc. Its main responsibilities are to formulate programs, rules and regulations for logistical construction, deploy logistical forces, organize logistical mobilization and provide logistical support, carry out the application, allocation, budgeting and final accounting of military expenditure, and conduct material procurement.

The General Armaments Department administers the provision of equipment for the armed forces. Under it are departments in charge of overall planning, equipment for all services and arms, procurement for Army's military equipment R&D, general-purpose equipment support, electronic information infrastructure, etc. Its main responsibilities are to formulate strategies, programs and plans, policies, and rules and regulations for equipment development, organize equipment R&D, experimentation, procurement, combat service, maintenance and support, and administer the PLA's funds for equipment buildup."[90]

Figure 4.2 provides a visual summary of this information.

Figure 4.2: High Command of the PLA

The PRC Military Structure

Source: DOD. *Military and Security Developments Involving the People's Republic of China 2011*. Washington, DC: Office of the Secretary of Defense. 11. http://www.defense.gov/pubs/pdfs/2011_cmpr_final.pdf

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The operational command levels directly under the CMC and the GDs differ among the branches. China's 2006 defense white paper describes this command process as follows:

> "The Army has no independent leading body, and the leadership of it is exercised by the four general headquarters/departments. A military area command exercises direct leadership over the Army units under it.
>
> The Navy, Air Force and Second Artillery Force, each of which has a leading body consisting of the headquarters, the political department, the logistics department and the armaments department, direct the military, political, logistical and equipment work of their respective troops, and take part in the command of joint operations.
>
> The Navy organizes and commands maritime operations conducted independently by its troops or in support of maritime operations. There are three fleets under the Navy, namely, the Beihai Fleet, Donghai Fleet and Nanhai Fleet. Each fleet has flotillas, aviation divisions, etc. under its command.
>
> The Air Force organizes and commands air operations conducted independently by itself or with Air Force personnel as the main fighting force, as well as air defense operations in the capital area. It has an air command in each of the seven military area commands of Shenyang, Beijing, Lanzhou, Jinan, Nanjing, Guangzhou and Chengdu, respectively. Under an air command are aviation divisions, ground-to-air missile divisions (brigades and regiments), antiaircraft artillery brigades (regiments), radar brigades (regiments) and other support troops. In major directions and key target areas there are also corps- or division-level command posts.
>
> The Second Artillery Force organizes and commands its own troops in case of launching nuclear counterattacks with strategic missiles and conducting operations with conventional missiles. Under it are missile and training bases, and relevant support troops.
>
> Military area commands (theaters of war) are military organizations set up according to the administrative divisions of the state, geographical locations, strategic and operational directions, and operational tasks. They are CMC-appointed organs for commanding joint theater operations. They direct the military, political, logistical and equipment work of the troops under them. Under a military area command are the headquarters, the political department, the joint logistics department and the armaments department. A military area command is mainly in charge of formulating programs and plans for combat readiness and operations of troops in the theater and for the reserve force buildup of the theater, organizing and commanding joint theater operations involving different services and arms, and providing joint logistical support. At present, the PLA has seven military area commands, namely, Shenyang, Beijing, Lanzhou, Jinan, Nanjing, Guangzhou and Chengdu."[91]

PLA Army (PLAA)

For the PLA ground forces, seven military regions (MRs) that cover all of China's territory represent the command level below the CMC–GD structure. These are further divided into subordinate military districts whose number varies among the MRs. The MRs also oversee provincial military commands in their areas of responsibility. These provincial commands are responsible for reserve force mobilization, recruitment, and political services.

The operational level directly subordinate to the MRs comprises 18 group armies (GAs) for the PLA ground forces. GA's represent the highest, exclusively military command level; they are roughly similar to a NATO corps and command a mix of divisions and brigades, although some GA's utilize only brigades or divisions. It is reported that the average number of troops under GA command has declined and may decline in the future, as the PLAA is shifting to a modular brigade structure[92] and already deploys GA's made exclusively of brigades.[93]

These changes have significant implications for the PLAA's force structure and order of battle. Although GA's are compared and roughly similar to a NATO corps, at 30,000-50,000 men, they command fewer men than corps in the US military. Moreover, a GA with an all-brigade force

structure would be more comparable to a US division.[94] Consequently, a shift in the PLAA force structure towards brigades would significantly reduce the number of personnel per GA and, unless additional GA's were added, such a trend would ultimately reduce PLAA force numbers.

Below the GA command level, ground forces are organized into divisions, brigades, regiments, battalions, companies, platoons, and squads. The exact order of battle varies between different MR's and GA's.

PLA Navy (PLAN)

For the PLAN, a naval staff headquarters represents the command level below the CMC–GD. The headquarters is responsible for maintaining combat readiness, force planning, and coordination with the GDs. The highest operational command level in the PLAN is made up of three fleets—the North Sea Fleet, the East Sea Fleet, and the South Sea Fleet. These are then divided into flotillas, groups, and squadrons.[95] All fleets maintain operational command over the forces in the area of their responsibility. Each fleet is organized to oversee coastal, deep-water, and naval aviation operations. Forces afloat are divided into divisions, regiments, and squadrons. In wartime, command over naval forces may be transferred to the MRs.[96]

PLA Air Force (PLAAF)

The PLAAF maintains an air force headquarters at a command level below the CMC. Operational command over the PLAAF, however, is dispersed among MR air force commands.[97] The MR headquarters retains control over combined operations while the MR air force commander is responsible for flight operations within the MR.[98] Tactical units include divisions, brigades, regiments, groups, squadrons, battalions, companies, platoons, squads, and flights.[99]

PLA Second Artillery Corps (SAC)

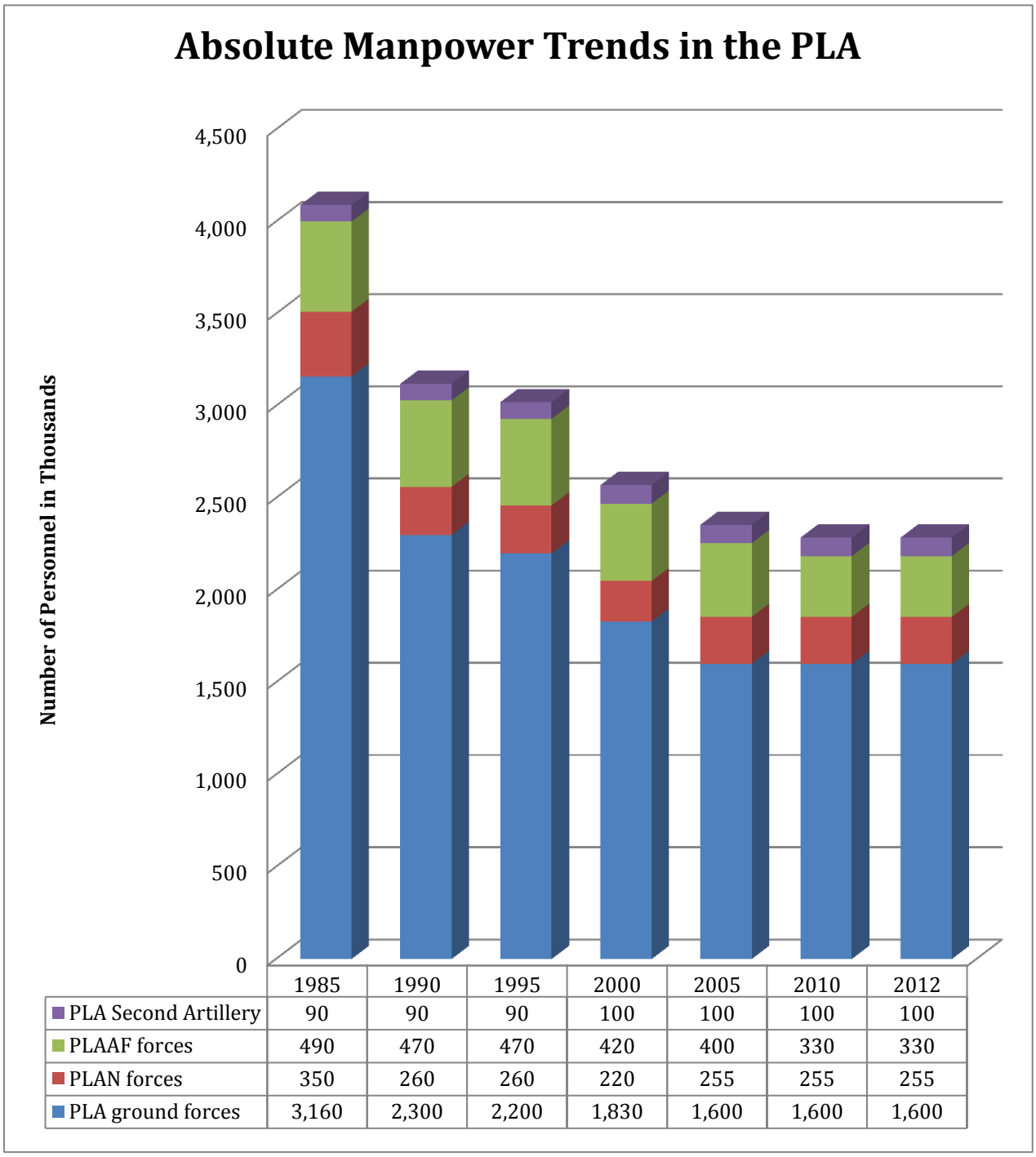
Although formally a branch of the PLA, not a separate service, the Second Artillery Corps also maintains its own headquarters. Beneath this headquarters are six corps also known as bases, which themselves command missile brigades, regiments, battalions, companies, and platoons. However, it is possible for both bases and brigades to operate independently directly under the CMC: according to the *Science of Second Artillery Campaigns*, the Second Artillery Corps has three command levels capable of independent action at the campaign level:

> "The participating strength of the Second Artillery Campaign is the Second Artillery Campaign large formation which normally contains the following three types: missile bases, missile base groups, and missile brigade at the campaign level."[100]

Personnel Trends and Shifts in the PLA's Force Structure

A key element of the PLA's modernization has been significant changes in personnel policies: key elements of the PLA's modernization, especially its new Local Wars military doctrine, have been the PLA's concurrent cuts to overall force strength and investments in human capital. The PLA has been significantly reduced in number three times since the 1980s: in 1985, 1997, and 2003. These cuts amounted to 1,000,000; 500,000; and 200,000 in personnel cuts respectively. Figure 4.3 below shows the absolute trends in the PLA's manpower since 1985.

Figure 4.3: Absolute Trends in PLA Manpower



	1985	1990	1995	2000	2005	2010	2012
PLA Second Artillery	90	90	90	100	100	100	100
PLAAF forces	490	470	470	420	400	330	330
PLAN forces	350	260	260	220	255	255	255
PLA ground forces	3,160	2,300	2,200	1,830	1,600	1,600	1,600

Source: IISS *Military Balance*, 1985-2012.

*Figures for SAC in 1985 not available: for purposes of comparison the SAC has been listed at 1990 levels.

In 2012, Chinese military and security forces consist of about 2,285,000 active PLA, 660,000 PAP service personnel, and at least 510,000 military reserve forces.[101] Moreover, according to the defense white papers, there are over 8 million militia members.

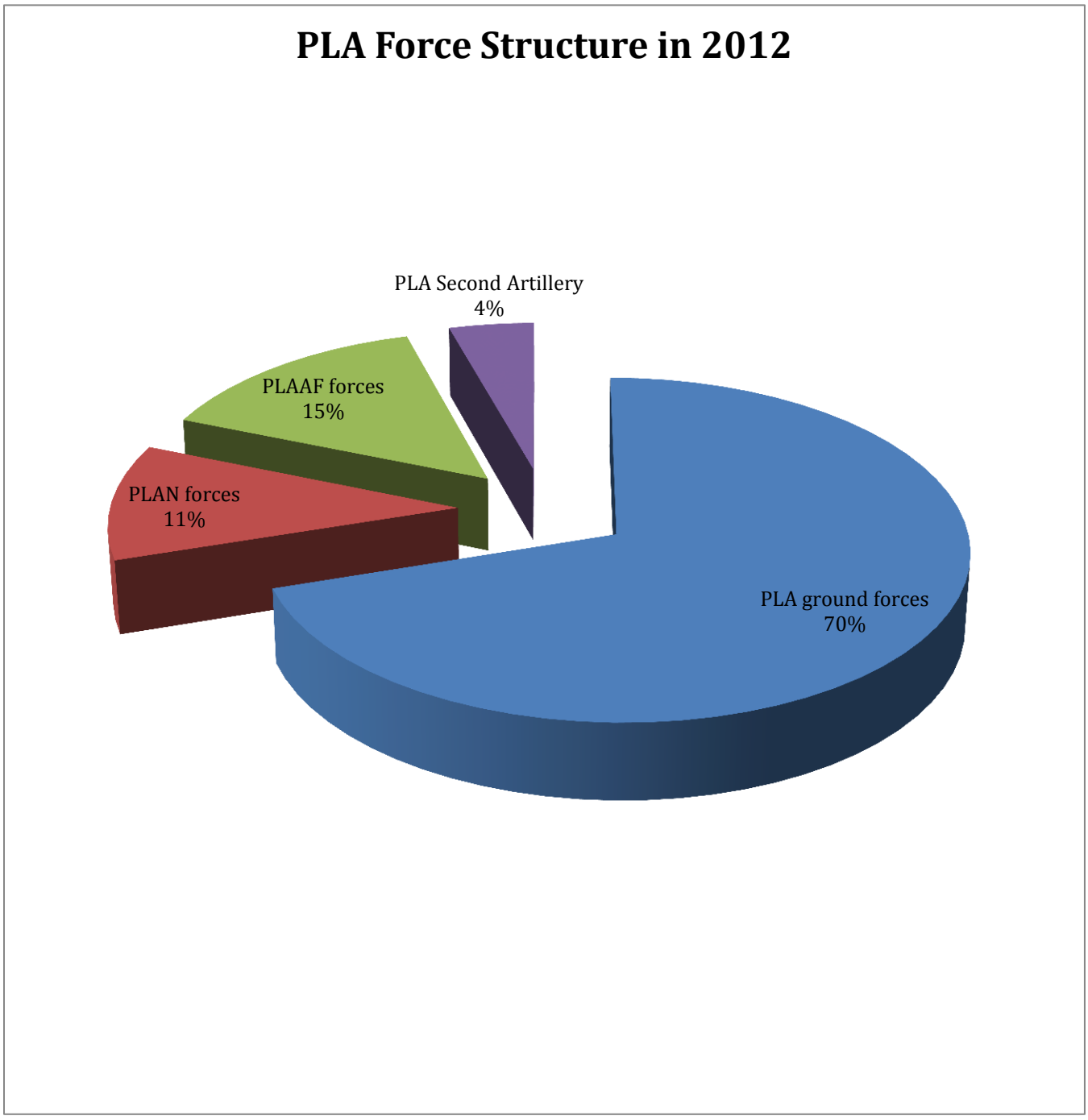
The Chinese 2006 defense white paper describes the reasons for recent changes and cuts in China's military manpower below:

> To effectively fulfill its historic mission in the new stage of the new century, the PLA is speeding up the revolution in military affairs with Chinese features and enhancing in an all-round way its capabilities of defensive operations under conditions of informationization.
>
> **. . .** In 1985, 1997 and 2003, China announced that it would cut the size of the PLA by one million, 500,000 and 200,000 persons, respectively. By the end of 2005, China had completed reducing the PLA by 200,000 troops, and the PLA currently has 2.3 million troops. The PLA has made new progress towards the goal of being proper in size, optimal in structure, streamlined in organization, swift and flexible in command, and powerful in fighting capacity.
>
> Downsizing the PLA: The Army was the focus of force reduction, and its authorized number of personnel has been reduced by more than 130,000. Over 60,000 military personnel have been removed from the headquarters and directly affiliated units of military area commands and provincial military commands. Through restructuring, the proportion of the Navy, Air Force and Second Artillery Force in the PLA has been raised by 3.8 percent while that of the Army has been lowered by 1.5 percent.
>
> Streamlining the headquarters and directly affiliated units as well as educational institutions: More than 3,000 departments of and over 400 units directly affiliated to the headquarters at and above the regimental level have been cut. A considerable number of agricultural and sideline production units, cultural and sports units, military representative offices at railway stations and material supply organs have been closed. The PLA has also closed 15 educational institutions and 31 training organizations.
>
> Improving the structure of services and arms: The Army has cut a number of combined corps, divisions and regiments, increased the number of combined corps whose order of battle is corps, brigade and battalion, and set up units with new and high-tech weaponry and equipment. The Navy and Air Force have cut some ship groups and aviation divisions, regiments and stations, and set up some high-tech surface ship, aviation and ground-to-air missile units. A number of reserve infantry divisions have been dismantled, but the number of divisions (brigades) of other arms has increased.
>
> The PLA has reduced the number of its officers by 170,000. More than 150 officer posts at or above the corps level have been eliminated, nearly 70,000 posts formerly taken by officers are now filled with non-commissioned officers (NCOs), and over 20,000 posts formerly taken by NCOs are now filled with contract civilians.[102]

Except for the Second Artillery Corps with its almost steady number of personnel, the other PLA branches have decreased their personnel.

The dominance, at least in terms of manpower, of the PLA ground forces is clear—they account for more than two-thirds of all PLA forces (70%). Against the background of the force reductions in the PLA ground forces, the PLAN and the PLAAF have increased their relative share of PLA manpower; they stand command 11 percent and 15 percent of the PLA, respectively. The Second Artillery Corps with 100,000 personnel makes up 4 percent of all PLA forces. This breakdown is shown in Figure 4.4.

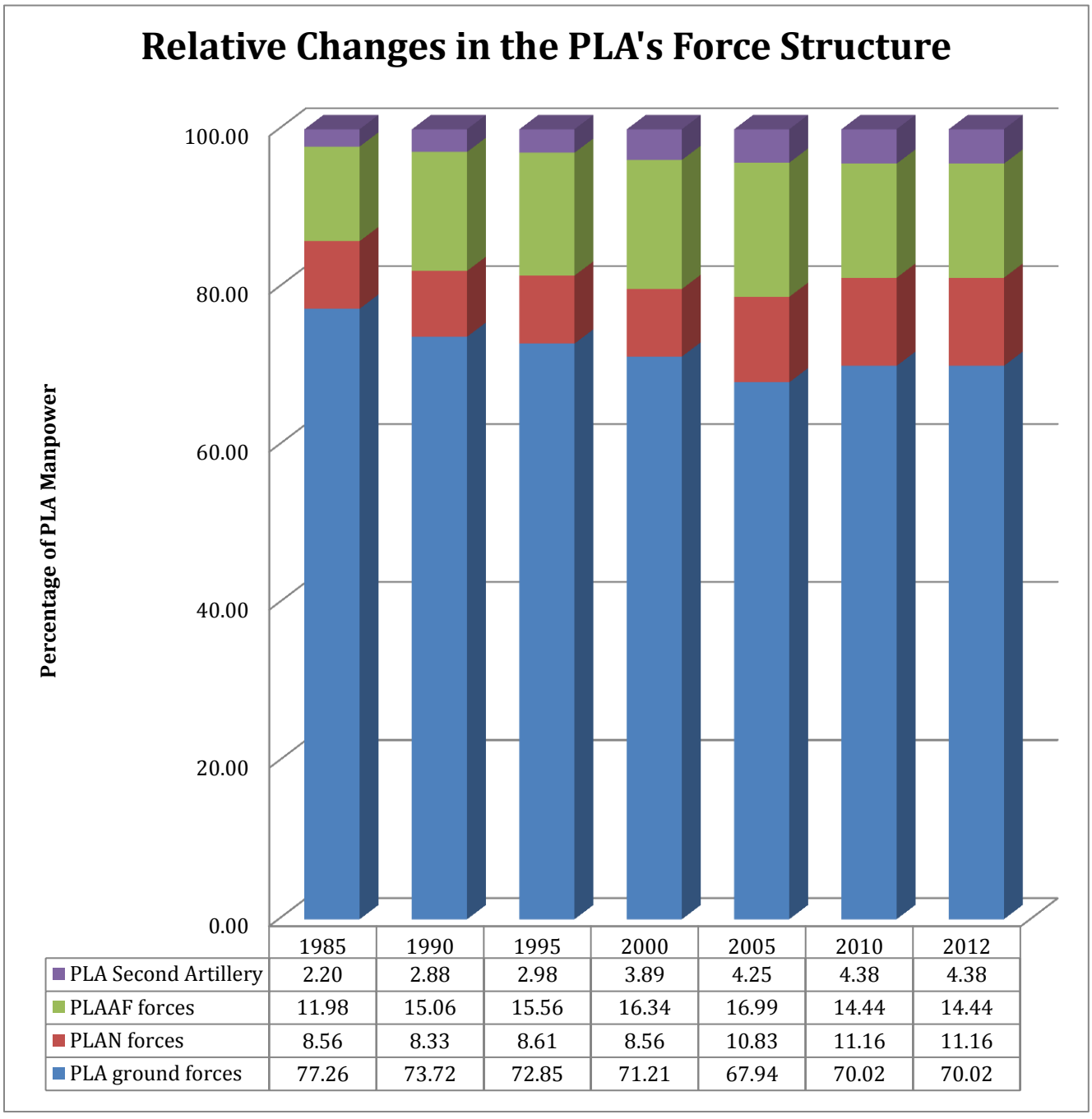
Figure 4.4: 2012 Force Structure of the PLA



Source: IISS, *Military Balance* 2012

Figure 4.5 below shows historical changes in the PLA's force structure. The trends indicate that the manpower reductions have disproportionately struck the PLAA and that the other services and the SAC have gained ground relative to the PLAA. This changing force structure is in line with the imperatives generated by the Local Wars doctrine, as quick, decisive wars under conditions of informatization require relatively more naval, air, and missile assets than total wars or even Deng Xiaoping's "Local Warfare under Modern Conditions" military doctrine. In addition, the requirements of "integrated joint operations," by necessity, require substantial forces other than ground forces: consequently, the dominance of the PLAA is eroding to the other services and the SAC. Combined with the inclusion of the heads of the PLAN, PLAAF, and SAC in the CMC,[103] it is possible to infer that the changes in manpower reflect changes in relative funding and prestige.

Figure 4.5: Relative Changes in the PLA's Force Structure



	1985	1990	1995	2000	2005	2010	2012
PLA Second Artillery	2.20	2.88	2.98	3.89	4.25	4.38	4.38
PLAAF forces	11.98	15.06	15.56	16.34	16.99	14.44	14.44
PLAN forces	8.56	8.33	8.61	8.56	10.83	11.16	11.16
PLA ground forces	77.26	73.72	72.85	71.21	67.94	70.02	70.02

Source: IISS, *Military Balance* 1985-2012

Shifts in the PLA's Personnel System

The PLA's personnel system is shifting in response to increasing human capital requirements of both the PLA's modern military doctrine and its more complex technology. These requirements necessitate a PLA which retains qualified personnel, increases individual and small unit proficiency, and attracts highly-educated recruits. As part of this effort, the PLA is attempting to build a professional NCO corps and increase the average level of education among the officer corps by rebalancing the personnel system, recruiting high human capital into the PLA, providing opportunities for increased qualification among the non-conscript PLA, and offering greater compensation for the entire force.

Rebalancing the Personnel System

The PLA is currently rebalancing its personnel system by replacing many conscript and officer positions with NCO positions. Prior to new regulations issued in 1999, conscripts had served for three to four years. However, in 1999, the CMC adjusted the conscription obligation to two years, and, in order to account for the drop in conscript numbers, augmented the authorized size of the NCO force.[104] This change occurred across the PLA, affecting all branches and the Second Artillery Corps. Complementing this change is a continuing reduction in the number of officers in the PLA and a transfer of many of their duties to the NCO corps.[105]

Recruiting High Human Capital into the PLA

The PLA is attempting to recruit personnel with higher levels of education or technical proficiency into the PLA. Offering bonuses of up to $3,500 to college graduates who volunteer for the armed forces, the PLA managed to recruit more than 100,000 college graduates in 2009, a number still below the official goal of 130,000.[106] As part of this effort to recruit college-educated personnel, Chinese media regularly advertise the need for college-educated recruits.[107]

In 2011, Chinese media reported a strengthened effort to obtain recruits currently in or graduated from college. Recently introduced benefits included relaxed restrictions on height, weight, tattoos, and ear piercings, as well as signing bonuses based on years of college completed.[108] Further targeting college graduates, the PLA offered benefits for veterans seeking advanced degrees and employment, conferring exemptions from postgraduate entrance exams and preferential hiring for public sector positions.[109]

State media report trends that may indicate a successful effort by the PLA to recruit and retain college graduates. One report states that approximately half of college students and graduates recruited in 2009 have entered officer training in 2011,[110] ostensibly after a two year period as an enlisted soldier.

The PLA's efforts to recruit civilians with technical skills has led to regulations, issued in 2010, in which civilians with specialized skills can be recruited into the military and be granted an NCO rank.[111] This option enables skilled civilians to skip the hardships of the first two years of conscript ranks.

The PLA also directly targets college graduates for officer positions through the National Defense Students program, which is roughly equivalent to the US Reserve Officer Training Corps.[112]

Opportunities for Increased Qualification

The PLA has augmented its ability to provide education and training to personnel in the ranks. There currently exist military academies for officer and NCO training, with the NCO education accomplished at three specialized academies or at officer academies with specialized courses for NCO's.[113] Moreover, the PLA does more than merely offer qualifications to the NCO corps: as one analyst states, NCO's are required to take advantage of qualification opportunities:

> As of 2008, all NCO's are required to earn one or more certificates of professional qualification relevant to their duties. Since 1999, when the professional skill appraisal system was started, more than 860,000 NCO's throughout the PLA are reported to have obtained professional qualification certificates recognized in the civilian community, as well as the army. The target date for all units to implement the full scope of professional skills testing is the end of 2012; those NCO's who do not pass their tests will not be promoted.[114]

One way which NCO's and officers gain qualifications within the PLA is to take short-term specialty training at participating military academies. In addition to classroom instruction, the PLA has promoted and made available other means of qualification such as correspondence and online courses.[115]

The PLA has a large formal military education system for its officer corps, with three tiers of academy that offer technical, bachelor, master's, and doctorate degrees. Basic PLA academies offer three and four year technical and bachelor degrees which turn civilians into second lieutenants. In addition to basic academies, there are intermediate and senior-level academies that confer masters and doctoral degrees. Moreover, the PLA has begun sending officers to earn advanced degrees at civilian institutions.[116]

Greater Compensation for PLA Personnel

The PLA is increasing the benefits and pay of its service members to encourage qualified personnel to enter and, just as importantly, remain within the PLA. Consequently, pay raises were authorized in 2006, 2008, and 2011. In particular, NCO's received a substantial pay raise in 2011 that saw salaries and benefits increase up to forty percent.[117] In addition, in line with its efforts to attract educated personnel, the PLA is offering tuition allowances to college students who postpone their studies for service in the PLA.[118]

Shifts in Reserve and Militia Force Structure

An often overlooked element of China's military modernization program has been a sustained shift in the force structure of the PLA's reserve and militia forces. While reliable quantitative data are unavailable, Chinese statements indicate that the reserve and militia forces are shifting from mass formations designed to reinforce PLA maneuver forces to smaller auxiliary formations dedicated to logistics, technical, and air defense roles.

PLA Reserve Forces

Chinese reserve forces consist of roughly 510,000 servicemen and servicewomen. Most reserve forces today are staffed by civilians, many of whom are demobilized from the ground force:

> Reserve officers are chosen mainly from qualified retired servicemen, civil officials, cadres of the people's armed forces departments, cadres of the militia and civilian technicians with the appropriate military specialties. Reserve soldiers are chosen mainly from qualified discharged soldiers, trained primary militia members, and civilians with the appropriate military specialties.[119]

Information about PLAN, PLAAF, and PLA Second Artillery reserves is largely unavailable, but their numbers are reported to have increased.[120] While quantitative data is unavailable, multiple reports, as well as China's white papers, indicate that the force structure of the PLA's reserve forces are shifting from their previous emphasis on combat/maneuver units to force structures based on specialized units and logistics units.[121] As the 2010 white paper states:

> To be able to respond to emergencies in peacetime and to fight in war, the focus of the reserve force is shifting from quantity and scale to quality and efficiency, from a combat role to a support role, and from the provision of general-purpose soldiers to soldiers with special skills. It is working to become an efficient auxiliary to the active force and a strong component of the national defense reserve.[122]

It is likely that reserve forces are structured to provide support to regular PLA units during contingencies, especially in the field of logistics. Although some reserve units are staffed with personnel specializing in information warfare, it is unclear what role reserve forces will play in the future beyond basic service providers.

PLA Militia Forces

The PLA is supported by the militias under the command of local military district governments and consist of young men organized in a standard military command scheme. There are primary and ordinary militias: according to the 2010 White Paper, primary militias comprise about 8 million men,[123] but numbers for ordinary militias are unavailable.

The militia forces are also undergoing a sustained shift in force structure. Once again, reliable quantitative indicators are unavailable. However, Chinese government statements indicate that the militia is shifting from a mass reserve of maneuver forces to a force dedicated to logistics and technical support, as well as air defense and internal security. The 2006 White Paper identifies these trends:

> Specialized technical units rather than infantry are becoming the backbone of the militia. The proportion of antiaircraft artillery, ground artillery, missile, communications, engineering, anti-chemical, reconnaissance, information and other specialized technical units in the overall militia force is being raised. The building of militia units of the Navy, Air Force and Second Artillery Force is being strengthened. A new organizational structure of the militia has taken shape, with specialized technical units and units with corresponding specialties serving as the main body, and air defense units, units of the Navy, Air Force and Second Artillery Force, and emergency response units playing a leading role.
>
> The state has increased investment in militia weaponry and equipment, with priority given to equipment for air defense, emergency response and maintenance of stability. The state has phased out a number of outdated weapons. Militia training reform has been deepened; a four-level system for organizing training is practiced, the four levels being provincial military commands, prefectural military commands, people's armed forces departments of counties (county-level cities or municipal districts) and basic-level people's armed forces departments. Through interlinked training as well as joint training and exercises with active PLA units, the militia has boosted its capabilities of conducting rapid mobilization and carrying out its specialized tasks.[124]

The 2010 White Paper also states:

> "The militia force gives priority to reinforcing those units which are tasked with defending border and coastal areas, providing service support for different arms and services, and responding in emergencies. It has been realigned to extend from rural to urban areas as well as to areas along important communication lines, from ordinary locations to key sites and areas, and from traditional industries to new and high-tech ones. As a result, its structure and layout have been further improved….

> Its capabilities in dealing with both emergencies and wars have been greatly enhanced. The militia strengthens its building of equipment for the purposes of air defense, emergency response, and maintaining stability, supply of new types of air defense weaponry and equipment, and retrofitting and upgrading of existing weapons.…
>
> The militia has taken an active part in such operations as counter-terrorism, stability maintenance, emergency rescue, disaster relief, border protection and control, and joint defense of public security, and has played a unique role in accomplishing diversified military tasks. Each year, it mobilizes more than 90,000 militiamen to serve as guards on bridges, tunnels and railways, more than 200,000 to take part in joint military-police-civilian defense patrols, more than 900,000 to participate in emergency response, rescue and relief operations following major natural disasters, and nearly 2 million to engage in the comprehensive control and management of social order in rural and urban areas."[125]

Importantly, the militia's critical infrastructure protection mission is not only in response to domestic threats: Second Artillery Corps equipment, missile positions, and mobilizations require extensive PAP and militia protection in light of the PLA's fear of espionage and adversary Special Forces missile suppression missions.[126]

Military Spending

There is a lack of consensus among military analysts regarding the real level of Chinese defense spending. Key problems that affect all reporting on international military expenditures are the lack of any clear standard for such reporting and the radically different costs a given government either faces or can assign to security military expenditures. A command economy like China's can assign drastically lower costs to virtually any defense activity than a market economy can, and most of the world's command economies do so.

At the same time, free market attempts to guess at the market cost of such military efforts are notoriously inaccurate and uncertain. The U.S. intelligence community found after the Cold War, for example, that its attempts to determine the economic burden of Soviet defense expenditure and the equivalent cost of Russian forces in U.S. terms were little more than econometric nonsense.

What is clear is that Chinese government statistics do not include some outlays that are standard reporting for most other countries. The following items of China's military spending are believed by many observers to be outside of official disclosure:

- Arms imports, foreign weapon procurement, military aid for and from foreign countries;
- Expenses for paramilitary forces;
- Expenses for strategic and nuclear forces;
- Government subsidies for military production;
- Expenses for military R&D; and
- The PLA's own fundraising.[127]

The true extent of China's state spending for its armed forces remains uncertain, but China has provided a detailed description of the formulation and control of its military spending in its 2010 defense white paper and also provided the following the rational for current trends:

> China adheres to the principle of coordinated development of national defense and economy. In line with the demands of national defense and economic development, China decides on the size of defense expenditure in an appropriate way, and manages and uses its defense funds in accordance with the law.

> With the development of national economy and society, the increase of China's defense expenditure has been kept at a reasonable and appropriate level. China's GDP was RMB 31,404.5 billion in 2008 and RMB 34,090.3 billion in 2009. State financial expenditure was RMB 6,259.266 billion in 2008 and RMB 7,629.993 billion in 2009, up 25.7 percent and 21.9 percent respectively over the previous year. China's defense expenditure was RMB417.876 billion in 2008 and RMB495.11 billion in 2009, up 17.5 percent and 18.5 percent respectively over the previous year. In recent years, the share of China's annual defense expenditure in its GDP has remained relatively steady, while that in overall state financial expenditure has been moderately decreased.
>
> China's defense expenditure mainly comprises expenses for personnel, training and maintenance, and equipment, with each accounting for roughly one third of the total. Personnel expenses mainly cover salaries, allowances, housing, insurance, food, bedding and clothing for officers, non-ranking officers, enlisted men and contracted civilians. Training and maintenance expenses mainly cover troop training, institutional education, construction and maintenance of installations and facilities, and other expenses on routine consumables. Equipment expenses mainly cover R&D, experimentation, procurement, maintenance, transportation and storage of weaponry and equipment. Defense expenditure covers costs to support the active forces, reserve forces, and militia. It also covers part of the costs to support retired servicemen, servicemen's spouses, and education of servicemen's children, as well as national and local economic development and other social expenses.
>
> In the past two years, the increase in China's defense expenditure has primarily been used for the following purposes: (1) Improving support conditions for the troops: Along with the economic and social development and the improvement of people's living standards, the PLA has adjusted servicemen's salaries and allowances, increased funding for education and training, water and electricity supplies and heating, upgraded logistics support for grass-roots units in a comprehensive and coordinated way, and improved the on-duty, training and living conditions of border and coastal defense forces and units in remote areas and harsh environments. (2) Accomplishing diversified military tasks: China has increased investment in improving MOOTW capabilities, in supporting earthquake rescue and disaster relief operations, in escort operations in the Gulf of Aden and waters off Somalia, in flood control and emergency rescue operations, and in international rescue operations. (3) Pushing forward the Revolution in Military Affairs (RMA) with Chinese characteristics. In view of the upward trend in purchasing prices and maintenance costs, China has moderately increased the funds for high-tech weaponry and equipment and their supporting facilities.
>
> In 2010, confronted by the residual impact of the global financial crisis and other uncertainties, the tension between revenue and expenditure in China's finances persists. Giving priority to socially beneficial spending in agriculture, rural areas and farmers, as well as in education, science and technology, health, medical care and social security, China has increased its defense expenditure moderately as needed. China's defense budget for 2010 is RMB532.115 billion, up 7.5 percent over 2009. The growth rate of defense expenditure has decreased.
>
> China practices a strict system of financial supervision of defense funds. The annual defense budget is incorporated into the annual financial budget draft of the central government, and then submitted to the NPC for review and approval. The auditing offices of the state and the PLA conduct audit and supervision of the defense budget and its enforcement. In recent years, the Chinese government has strengthened systematic and meticulous management of defense expenditure, reformed and innovated financial management systems, pressed forward with reforms in asset management, reinforced budget implementation, supervision and management, and organized auditing of economic responsibilities of military leaders and special auditing of the use of funds and materials. In this way, transparency and standardization of defense expenditure are enhanced, and the proper and effective use of defense funds is ensured.[128]

Most outside experts believe that China's real military expenditures sharply exceed the officially stated numbers and that the announced Chinese defense expenditures for 2012—$106.4 billion—do not suffice to support an organization that maintains 2.3 million service personnel and an increasingly sophisticated and therefore expensive arsenal of weapon systems. The U.S.

government has at least implied that China is hiding information about military spending that should be made public.

Another observer points out that pay increases and expenditures for social services among the armed forces have increased substantially in recent years. Large pay raises have been authorized in 2006, 2008, and 2011. However, it is not clear whether pay increases have, in relative terms, outspent overall military expenditure growth.

Any statement about Chinese military spending must, therefore, at least consider the potential sum of dispersed, partly classified, and sometimes unreported numbers. In practice this has led to radically different estimates of real Chinese military spending.

The U.S. Department of Defense estimates from 1996-2009 are compared with the announced Chinese spending figures in Figure 4.6. The DOD explains that its estimates for 2012 range from $120 billion to $180 billion, a variance of about 50 percent.[129] Using a median estimate of $150 billion, the PRC's DOD-reported defense budget is roughly 23% of the US defense budget - reported by the US DOD at $656 billion.

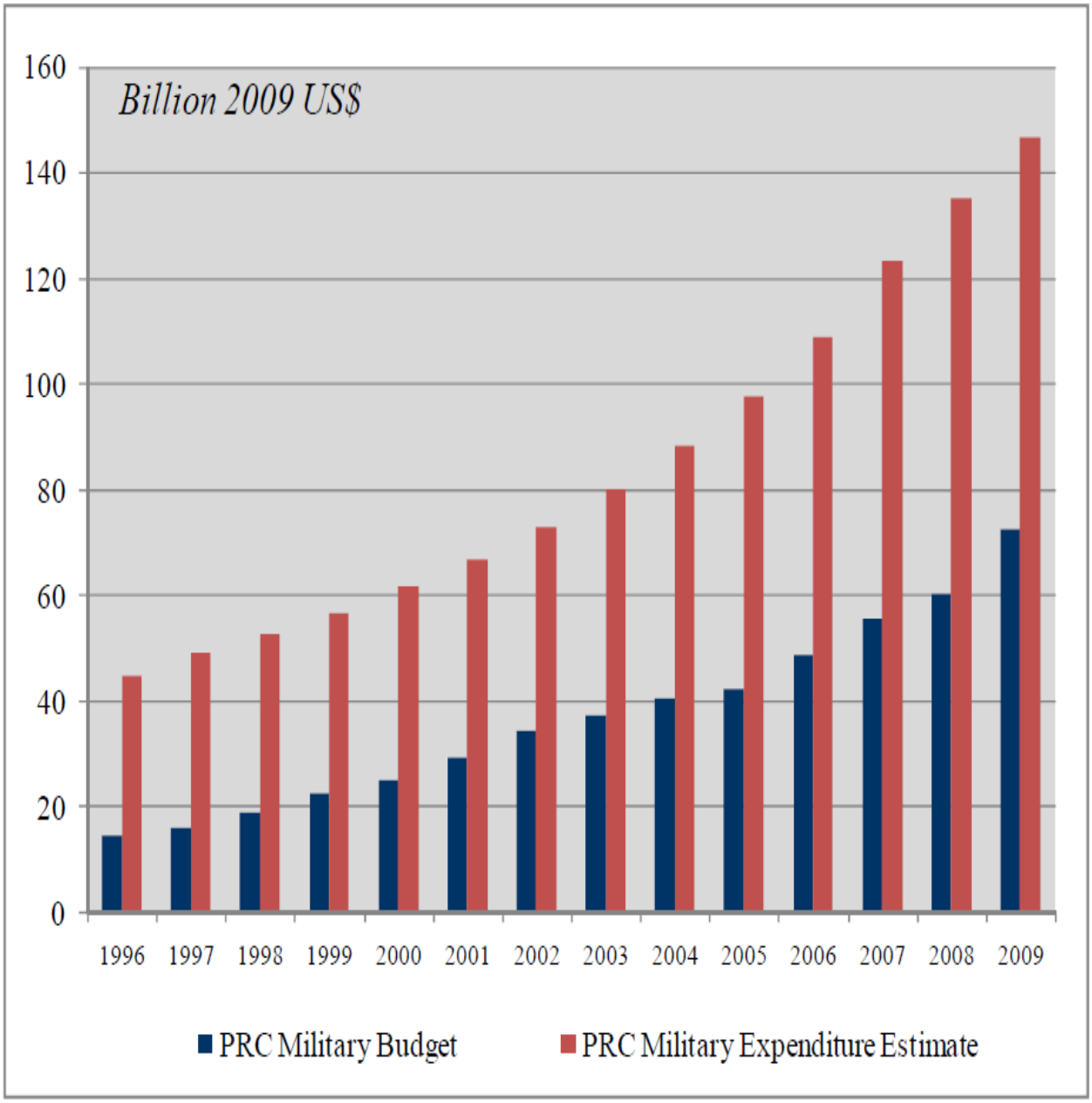
Most estimates by non-Chinese analysts that put military expenses several times over PRC figures rely on PPP models. This conversion rate poses several problems:

- The assumed relative buying power of Chinese government funds in PPP terms refers to buying Chinese-made goods;
- The market for military equipment and services in China is highly non-transparent, and transferring average PPP assumptions to the state-run military-industrial complex almost certainly will result in skewed results, even more so as China is importing military goods manufactured abroad;
- Purchasing power theory loses its descriptive value when applied to goods, which are not homogenous; weapon systems and other military purchases are artificially protected by government regulation; and
- The return on investment in buying Chinese-made goods is unclear, and it is not unlikely that an indigenous product that meets state-of-the-art quality may actually cost more money than arrived at by PPP conversion.

What is clear is that Chinese military spending is on the rise, and annual growth rates are high in comparison with most other countries. If low U.S. estimates approximate real Chinese spending, China's defense spending in 2012 will be the second largest in the world.

Figure 4.6, taken from the 2010 DOD Report, shows a comparison of Chinese announced defense budgets and U.S. estimates of the actual size of the Chinese budget over the years 1996-2009. The U.S. figures try to take into account all military-related expenses, as outlined above. This has resulted in a low estimate and a high estimate, suggesting that the real amount of Chinese defense spending, according to the DOD, is somewhere in between. A detailed methodology on how the estimates are arrived at is not available. For purposes of comparison, Figure 4.7 details historical US defense spending from 1950-2017.

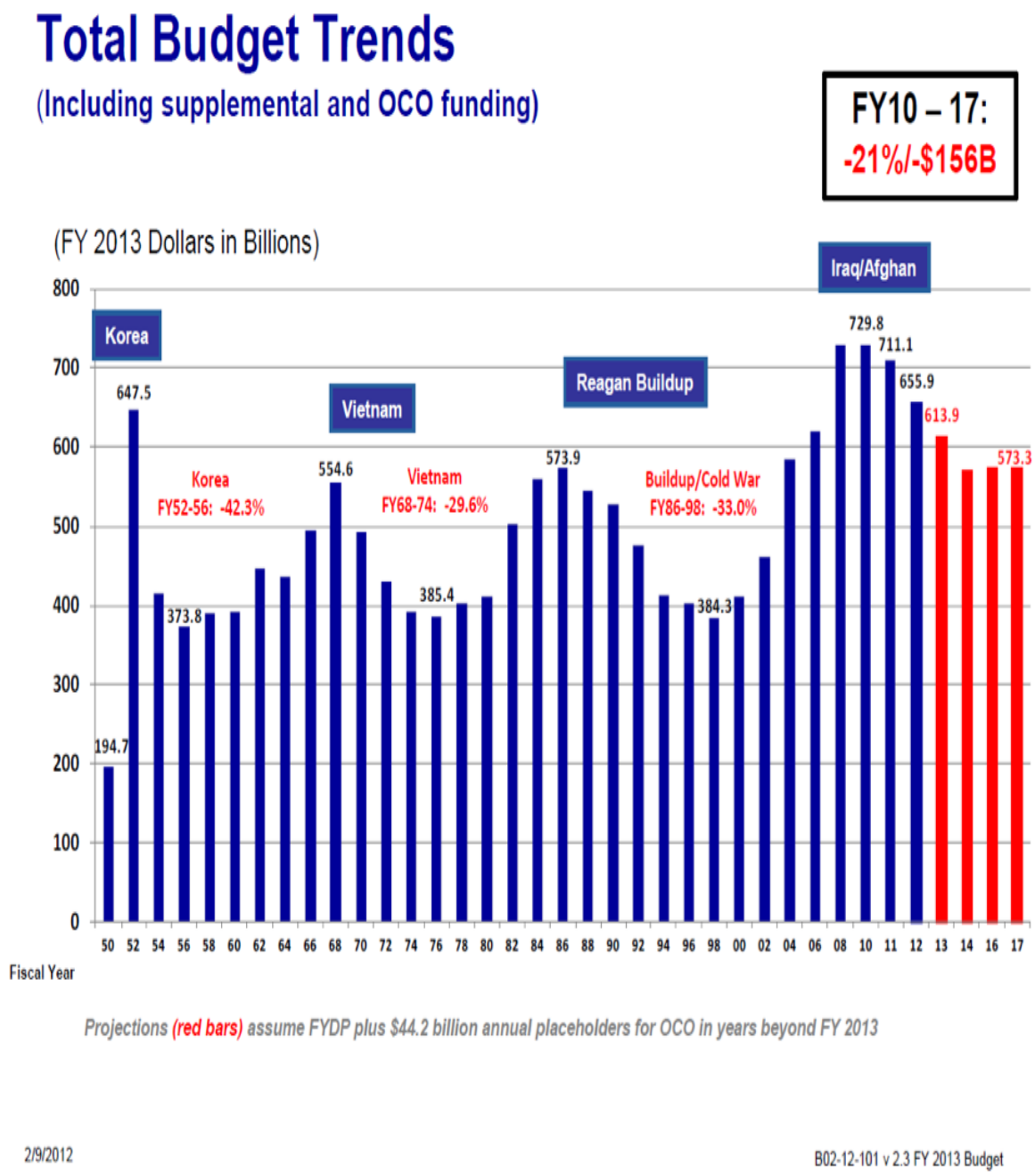
Figure 4.6: Historical PRC Defense Budget Compared to US Estimates of Total Defense Spending



China's Annual Real GDP and Military Budget Growth, 2000 - 2009.

Source: DOD. *Military and Security Developments Involving the People's Republic of China 2010*. Washington, DC: Office of the Secretary of Defense. 42.
http://www.defense.gov/pubs/pdfs/2010_CMPR_Final.pdf

Figure 4.7: Historical US Defense Expenditures



Source: DOD. *Fiscal Year 2013 Budget Request*. Washington, DC: Office of the Undersecretary of Defense (Comptroller)/Chief Financial Officer. February 2012. http://comptroller.defense.gov/defbudget/fy2013/FY2013_Budget_Request_Overview_Book.pdf.

PRC White Papers consistently state that the defense budget is split approximately equally between personnel, training and maintenance, and equipment expenditures. Figure 4.7, a graph published in the 2010 White Paper supports these government statements by providing an accounting breakdown of the PRC's 2009 defense budget: spending for personnel, training and maintenance, and equipment is almost equally distributed, with equipment expenses slightly higher than the other titles. A more detailed breakdown of spending allocations is not available.

Figure 4.8: Official PRC Defense Budget Allocation for 2009

Table 1: China's Defense Expenditure in 2009 (unit: RMB billion)

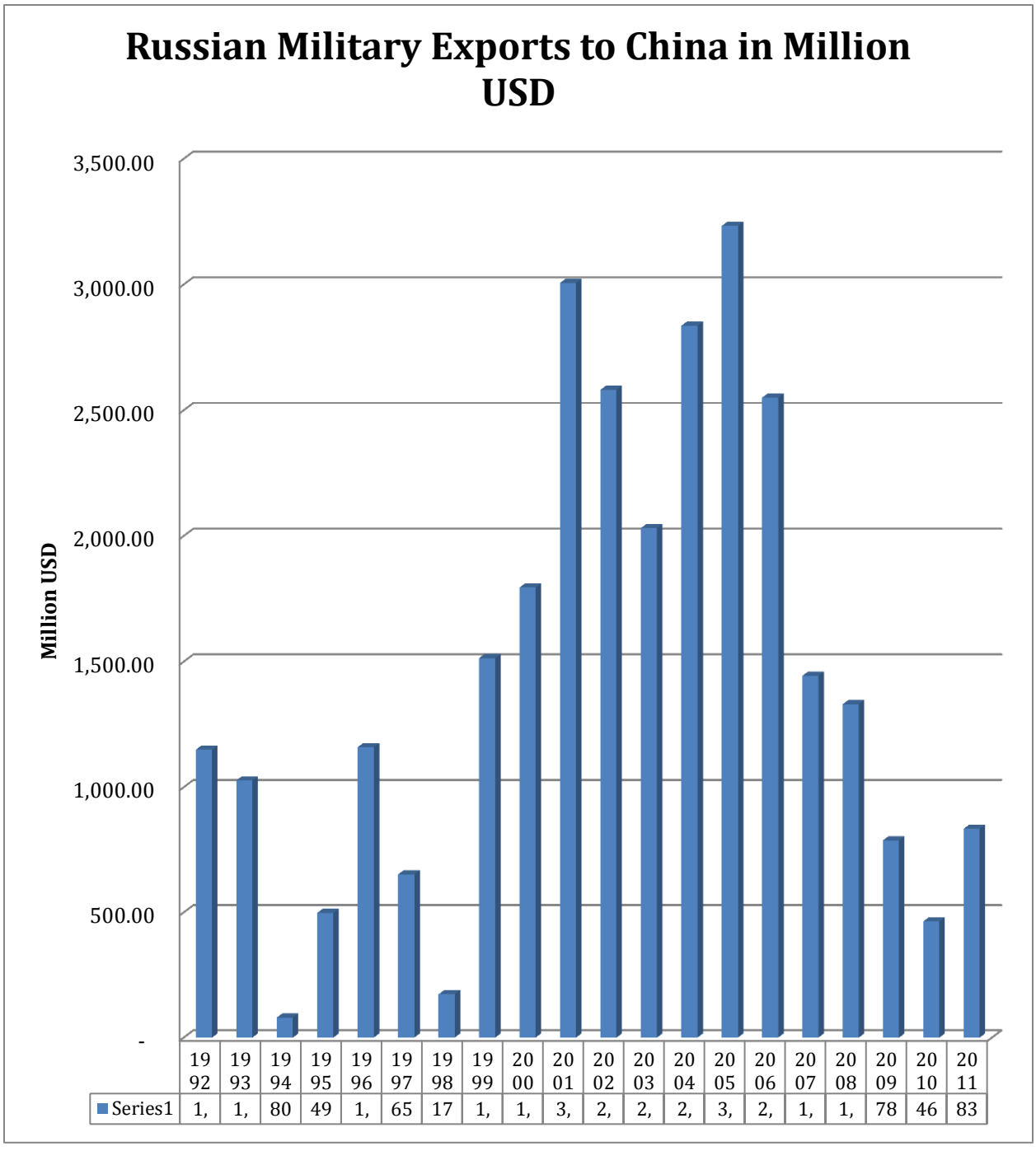
	Active Force	Reserve Force	Militia	Total	
				Amount	Percentage
Personnel	167.063	1.465	0	168.528	34.04
Training & Maintenance	152.171	1.965	12.859	166.995	33.73
Equipment	157.426	1.431	0.73	159.587	32.23
Total	476.66	4.861	13.589	495.11	100.00

Source: *China's National Defense in 2010*. Ch. 8. http://english.gov.cn/official/2011-03/31/content_1835499_10.htm. 30 March 2011. Accessed 2 March 2012.

Estimates of Chinese expenditures have historically ranged from under two to four times the announced defense budget. However, as one analyst points out, it is important to recognize that extra-budgetary expenditures vary from year to year, "so no arbitrary multiplication factor can be applied to the announced budget for more than one year."[130]

Consequently, estimates on extra-budgetary expenditures must be evaluated each year for every source of extra-budgetary spending. For example, foreign weapon expenditures, not covered under the announced PRC budget, have fluctuated significantly since 1985. Moreover, they significantly decreased absolutely, in terms of total dollars spent, and relatively, in terms of percentage of the total defense budget, since their peak in the late 1990's to mid-2000's. Consequently, simple trend lines cannot accurately predict PRC extra-budgetary spending on foreign arms imports. Figure 4.10 shows the absolute trends in PRC arms imports.

Figure 4.9: PRC Arms Imports 1985-2011



Source: SIPRI. Arms Transfers Database, Importer/Exporter TIV Tables. http://armstrade.sipri.org/armstrade/page/values.php. Accessed 20 June 2012.

The multiplicity of drivers for extra-budgetary expenditures, as well as the fluctuations in these extra-budgetary drivers, may account for the differing multipliers placed by the DOD on the official PRC defense budget. The low estimate was over three times the official Chinese amount for the 1990s; for the early 2000's, the low estimates equaled a rough 2.5 to 1 ratio. Since 2009, the estimates have been a roughly between 1.5 and 2 times the official PRC military budget. The high estimates were more than five times the official figures in the mid-1990s. Today the ratio between the high U.S. estimate and official Chinese figures stands between 1.8 and 2.5 to 1.[131]

While a reason for the closing gap shifting growth rates in the PLA's extra-budgetary accounts, one analyst suggests that the closing gap may be a result of the PRC including previously off-budget accounts into the official defense budget.[132]

It is important to note that absolute defense expenditures do not illustrate the defense burden on a society or the priority given to defense outlays. Relative expenditure on defense, whether compared to national GDP or total central government expenditure, are better indicators of the defense burden on a given state and society. Figure 4.10 is a Chinese government graph depicting the percentage of total government expenditures devoted to the official defense budget. It indicates that the total defense burden on the Chinese state and society is decreasing despite the significant increases in absolute defense expenditures.

Figure 4.10: Relative Burden of the Official PRC Defense Budget on State Finances

Percentage of the PRC's Financial Expenditure Devoted to the Official Defense Budget

Year	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Percentage	8.66	8.16	7.6	7.63	7.74	7.74	7.72	7.29	7.37	7.14	6.68	6.49

Source: *China's National Defense in 2010*. Ch. 8. http://english.gov.cn/official/2011-03/31/content_1835499_10.htm. 30 March 2011. Accessed 2 March 2012.

While the US DOD compares PRC defense expenditures to national GDP rather than state expenditures, it assesses that, despite significant increases in the defense budget, "the actual change in the implied burden of the official defense budget on the economy appears negligible," largely as a result of significant GDP growth.[133]

Regardless, a comparison of Chinese defense spending over time leaves no doubt that Chinese absolute military spending is on the rise. Annual average growth rates of over 11 percent over the past decade[134] (based on Chinese reported numbers) are certainly high by international comparison, yet they appear to be sustained by almost equally high GDP growth rates. Predictions for further military expenditure growth thus depend on continuously high GDP growth rates. Social unrest or other domestic problems may lead to a diversion of funds away from defense expenditures, yet currently there is no sign that military spending is slowing, especially given the emphasis that Chinese leaders place on the modernization of the armed forces.

Institutional PLA Modernization

Modernization is occurring in virtually every aspect of the Chinese armed forces. According to its 2006 defense white paper, China is pursuing a three-step strategy to modernize its armed forces. It seeks to create a "solid foundation" by 2010 and reach another phase of "major progress" by 2020. It then seeks to be "capable of winning informationized wars by the mid-21st century.[135] As might be expected, however, trend analyses show that faster progress is occurring in some areas while other areas prove to be more resistant to change. Also important but frequently overlooked, is that the results of equipment modernization are strongly influenced by the PLA's ability to modernize its tactics, strategy, training, and communications networks.

Uncertain Pattern of Change

As the full text of the white paper shows, the modernization of the Chinese armed forces entails the whole spectrum of armed forces development: war-fighting doctrine, strategic and tactical guidelines, training methods, C4ISR, procurement services, interoperability among PLA services, equipment, and human resources management. Any meaningful assessment of this modernization must establish a benchmark against which the processes that constitute modernization can be judged.

When one uses the most modern technologies and management methods employed by world armies as comparison, as is often the case, the modernization of the PLA presents a mixed picture that renders quick predictions baseless. It must be understood that any quantitative assessment of increases in modernization spending falls short of describing combat effectiveness.

Military modernization, especially in a large organization like the PLA, proceeds asymmetrically. While some units may use cutting-edge technology that provides war-fighting superiority, it is almost certain that large parts of the armed forces keep outdated and inoperable equipment and have a low standard of training. American PLA analysts have observed such outcomes.[136] At the same time, other countries continue developing new weapon systems and thereby raise the standards against which China's status quo capabilities can be judged.

Given the hazards mentioned above, this paper measures PLA modernization and force development, not in comparison to the US or other Western militaries, but according to the demands and required capabilities of PLA military doctrine. Given the centrality of the Local

Wars theory, this paper will measure the progress of PLA modernization based on the trends in the PLA's ability to fight and win Local wars.

This metric is difficult to utilize in practice. While changes in force structure and the modernization of certain equipment categories may ostensibly augment or harm the PLA's ability to prevail in Local Wars, the intangible, human variables such as combat, technical, and command proficiency also have marked effects on military effectiveness. Quantitative comparisons between third- and fourth-generation fighters, for instance, can blur the fact that well-trained pilots in third-generation aircraft might display higher combat effectiveness than their counterparts in newer planes. The same holds true for virtually all weapon systems.

China fought its last international war in 1979, a war that was relatively limited in scope and lasted barely a month. Virtually no members of the armed forces possess any war-fighting experience. Although the lack of experience is difficult to quantify and compare with other indicators, it has the potential to become a significant disadvantage in an armed conflict against experienced enemy forces.

With these caveats in mind, the remainder of this chapter will briefly survey key elements of Chinese modernization that will affect the quantitative and service-specific analyses of PLA military modernization and force development in the following chapters.

Shifts in PLA Training Practices

Over the last decade, the PLA has made a sustained effort to improve the quality and realism of the training received by its personnel. In addition, it has augmented its scenario-specific training, especially for situations that require specialized forces.

The CMC issued new training guidelines in 1999, which were codified by the GSD into an "Outline of Military Training and Evaluation" (OMTE) in 2002. The 2002 OMTE set uniform standards and led to an increased focus in many training areas such as combined arms and joint operations, force-on-force training, rapid reaction, information countermeasures, and comprehensive logistical support.[137]

It is impossible to determine the exact effects of the OMTE, but one analyst asserts that the new guidelines have considerably improved training quality.[138] He cites a lack of truly joint, large-scale, or force-on-force exercises in the PLA prior to the 1999 regulations and the 2002 OMTE. Specifically, he argues that the PLA's training before 1999 was heavily scripted and limited by a lack of funding, experience, and equipment.[139] Corroborating this view, multiple Chinese government media sources from the early 2000's speak of the need to add "realism" to training.[140] Over the course of the decade, this exhortation among official PRC media markedly increased, but changed in tone to a sense of accomplishment as "scripted" exercises were supposedly reduced and units began to "train as you fight."[141]

In the beginning of the second decade of the 21st century, the PLA's shift in training practices has reportedly broadened to include more challenging training subjects. Following the release of the 2009 OMTE, a revision of the 2002 document, additional training skills have been emphasized such as operating in complex weather, terrain, and electromagnetic conditions and conducting military operations other than war (MOOTW).[142]

The DOD predicts that the PLA will assign greater importance to training and equipment integration in the second decade of the 21st century. Portraying the first decade of the new century as a period of procurement, the DOD states:

> The first decade of the 21st century can be characterized as a period of ambitious PLA acquisition and development. Although this trend will continue in the years ahead, the more dominant theme of the 2010-2020 decade is likely to be training and integration. Senior PRC leaders recognize that this period will prove critical to meeting the PLA's modernization objectives, and they have demanded that the military engage in more realistic training and organizational reform.[143]

In addition, there are key warfare areas that the PLA has made a specific focus of its training program.

Joint Operations

The PLA has made progress in its efforts to train its forces for joint operations. The PLA reportedly did not conduct truly joint operations during the 1980's and 1990's, as formations from different services carried out tasks in proximity to one another rather than truly coordinate actions under a single unified headquarters. However, by the middle of the first decade of the 21st century, the PLA was reportedly conducting joint training exercises with forces that were operating far from their garrison locations.[144]

The poor outcome of previous joint exercises led to the creation of a new term, "Integrated Joint Operations," in 2004 to both capture the need for true joint operations and to emphasize the role of support forces in joint operations.[145] By the end of the decade, many official media reports on the Second Artillery Corps were keen to report on military exercises taking place under "complex electromagnetic conditions," or conditions in which an adversary is waging electronic warfare against a PLA unit.[146] Thus, there is evidence that the new term has led to tangible changes in training, such as the focus on the use of electronic warfare support forces.

One of the most recent multi-service military exercises was Joint Action 2010, in which formations at the GA-level conducted air-land operations, especially long-distance mobilization.[147]

Amphibious Operations

Until the late 1990's, amphibious operations was not considered a high priority for training purposes. However, by the turn of the millennium, the PLA had shifted focus towards amphibious operations: in April, 2000, the PLA acknowledged that the Nanjing and Guangzhou MR's had concentrated on amphibious operations. In addition, it is reported that the Shenyang, Beijing, and Jinan MR's receive enough amphibious training to act as follow-on forces for any amphibious campaign.[148]

To build capacity in amphibious operations, the PLA has developed joint amphibious operation training areas and conducted amphibious exercises involving large numbers of forces. One analyst estimates that one-third to one-quarter of PLA forces has received some type of amphibious warfare training.[149]

Focus on C4ISR and Information Technology

Reports indicate that the PLA is investing heavily in the enhancement of all C4ISR and logistics capabilities, drawing on resources of the civilian computer and high-tech industries.[150] Given that

military modernization is virtually impossible without comprehensive, modern C4ISR capabilities, China's efforts in this regard will certainly lie at the center of China's modernization strategy.

The PLA increasingly relies on modern IT applications. Evidence for this is the PLA's increased efforts to create an advanced C4ISR network among the PLA branches and services, IT-enabled weapon systems, the proliferation of information warfare units, and efforts to recruit highly qualified civilian IT experts. PLA leaders understand that conducting "integrated joint operations" is virtually impossible without effective, decentralized C4ISR networks, and they have identified the PLA's deficiencies in this sector as a key stumbling block to efforts at joint operations.[151]

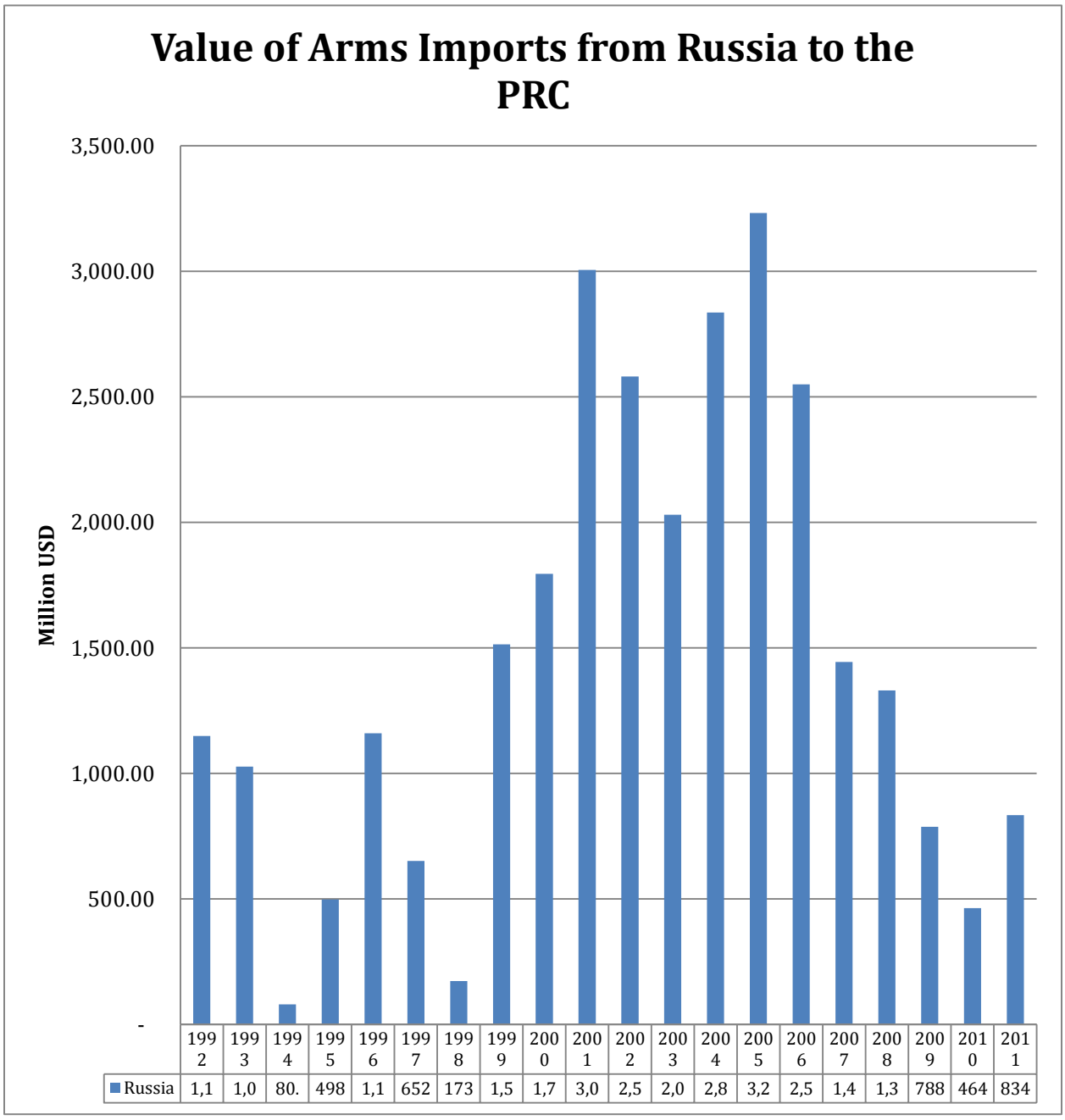
While the PLA recognizes the great importance of exploiting C4ISR and information technology, security sector modernization is contingent upon both civilian and military determinants, most notably China's five-year economic development plans. An unexpected economic crisis or changes in technology accessibility may significantly delay the application of modern weapon systems as well as investments in human capital.

Arms Trade and Technology Transfer

Although China has significantly reduced weapon system imports, both absolutely and relatively, since the mid-2000's, China continues to import and reverse engineer foreign weapon systems. Among all developing nations, China ranked fourth in the value of concluded arms import agreements[152] with a total of $6.33 billion in agreements between 2007 and 2011.[153]

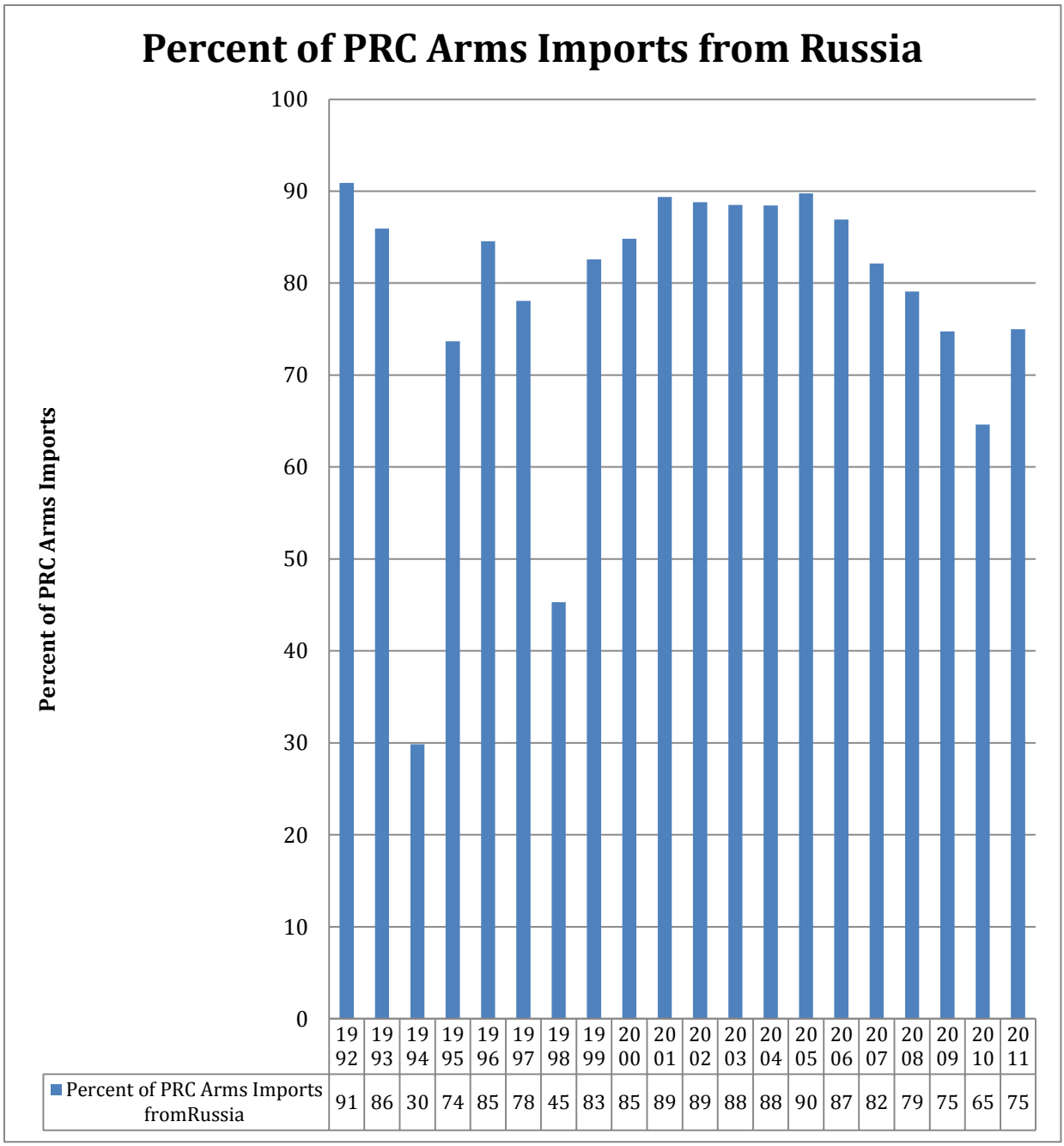
Russia is a key player in this process. Figure 4.12 shows the scale of absolute military imports from Russia to China while Figure 4.13 shows the value of Russian imports relative to all of the PRC's military imports.

Figure 4.11: Absolute Value of Russian Arms Imports to China (1992-2011)



Source: SIPRI. Arms Transfers Database, Importer/Exporter TIV Tables. http://armstrade.sipri.org/armstrade/page/values.php. Accessed 20 June 2012.

Figure 4.12: Percentage of Overall PRC Arms Imports from Russia



Source: SIPRI. Arms Transfers Database, Importer/Exporter TIV Tables. http://armstrade.sipri.org/armstrade/page/values.php. Accessed 20 June 2012.

The acquisition of dual-use goods poses a serious problem when constructing a comprehensive picture of the PLA's overall technological capabilities. The 2012 DOD report states that China is pursuing a systematic effort to exploit dual-use goods for modernizing its armed forces.[154] The dominance of state-run companies, in combination with a government-mandated policy of secrecy, makes it very difficult to track down the potential applications of single items. In light of the information provided in the yearly DOD reports, it seems likely that China is undertaking systematic efforts to exploit dual-use goods for military purposes.

Overall it appears that China no longer *relies* on weapon imports to modernize its army: China has shown the ability to contribute to almost all areas of weaponry development to produce modern weapon systems without outside assistance. Examples of advanced indigenous weapon systems are the J-10 and J-20 aircraft: The PLAN also operates advanced, indigenously designed surface combatants such as the *Luyang* guided missile destroyer and the *Jiankai* guided missile frigate. However, a sudden cessation of imports would certainly delay weapon system development and procurement significantly.

Underlining this trend is the decreasing value of Russian arms imports. Figure 4.12 shows the decreasing absolute value of Russian arms imports to China. When compared to the double digit growth in China's announced defense budget, it becomes clear that the value of Russian arms imports, relative to the PRC's overall defense budget, is steadily decreasing. One report from the Congressional Research Service (CRS) states that this trend is a result of Chinese efforts to integrate and reverse engineer existing technology. As the report states:

> There have been no especially large Russian arms agreements with China most recently. The Chinese military is currently focused on absorbing and integrating into its force structure the significant weapons systems previously obtained from Russia, and there has also been tension between Russia and China over efforts by China's apparent practice of reverse engineering and copying major combat systems obtained from Russia, in violation of their licensed production agreements. However, there is currently the prospect of Chinese purchases of new Russian fighter aircraft, if agreement on terms protecting Russian technology can be reached.[155]

While China is developing a growing ability to develop its own weapons, the reliance upon reverse engineering means a probable de facto Chinese reliance on foreign technology for at least one decade. Many of China's most modern weapon systems, especially in the aviation sector, are imports from Russia, such as the Su-27 and Su-30, or are copies of Russian goods, such as the J-11. Further, some weapon systems, even those which are indigenous, rely on certain foreign technologies. Helicopter, radar and engine technology, for example, are being developed, imported, or produced under licenses with a significant application of Russian and European technology.[156]

Chapter 5: The PLA Army

Since the mid-1980s, the PLA Army (PLAA) has steadily reduced its overall force size and developed modern capabilities and systems in critical areas of the future battlefield. Main Battle Tanks (MBT's), Armored Infantry Fighting Vehicles (AIFV's), Armored Personnel Carriers (APC's), self-propelled artillery, and Air Defense (AD) weaponry have all seen significant improvement with the introduction of newer classes of weapons and upgrades to existing models.

A key goal behind these changes has been improving the PLAA's ability to fight "Local Wars under Conditions of Informatization" by improving its ability to move quickly, deliver devastating blows without relying on sheer mass, and defending itself from enemy electronic warfare (EW) and air attacks. As a result, the PLAA is more capable of responding to regional contingencies on the Eurasian mainland than it was in the past.

Shifts in Force Structure, Manpower, and Equipment

Figure 5.1 below displays the declining manpower of the PLAA as well as the shifts in equipment holdings from 1985-2012. Figure 5.1 and the Figures that follow show consistent movement from a large force dependent on masses of manpower and lower quality weaponry to a smaller force reliant on better trained manpower and improving weapon systems. The balance between modern and non-modern equipment is shown in later Figures.

Key indicators shown in later Figures relate to force structure, manpower, and equipment. Regarding force structure, these key indicators include the decreasing number of large formations such as divisions, especially infantry divisions, and the simultaneously increasing number of smaller units such as brigades and specialized regiments. Manpower changes are listed at the top of the table and record a nearly 50% decrease in PLAA manpower. Key indicators regarding equipment trends include the retirement of vintage Soviet systems and the deployment of advanced 90's-type MBT's, 00's-type AIFV/APC's, self-propelled artillery, and self-propelled AD systems.

It is important to note that a range of sources exists with different figures and estimaters. The data used all graphs and tables in Chapter 5, including Figure 5.1, and are taken with minor modifications from various editions of the *IISS Military Balance*.

Figure 5.1. PLA Ground Forces: Force Structure 1985-2012

	1985	**1990**	**1995**	**2000**	**2005**	**2010**	**2012**
Manpower (PLA + paramilitary forces + reserves)*	9,000,000+	4,230,000	4,130,000	3,570,000	4,655,000	3,455,000	3,455,000
Active	4,000,000	3,120,000	3,020,000	2,470,000	2,355,000	2,285,000	2,285,000
Conscript	?	1,350,000	1,275,000	1,000,000	990,000	?	?
Army	3,160,000	2,300,000	2,200,000	1,700,000	1,600,000	1,600,000	1,600,000
Navy	350,000	260,000	260,000	220,000	255,000	255,000	255,000
Air Force	490,000	470,000	470,000	420,000	400,000	330,000	330,000
Strategic Missile Forces	?	90,000	90,000	100,000+	100,000	100,000	100,000
Paramilitary	?	incl. in reserve	1,200,000	1,100,000	1,500,000	660,000	660,000
Reserve	5,000,000	1,200,000 Paramil.)	?	?	800,000	510000	510,000
Army	?	?	?	500-600,000	500,000	?	?
Navy	?	?	?	?	?	?	?
Air Force	?	?	?	?	?	?	?
Combat Units - Army							
Army Group	35	24	24	21	18	18	18
Armored Division	13	10	10	10	9	8	9
Infantry division	118	80	78	44	15	0	1
Mechanized Infantry Division	?	?	2	7	5	8	10
Motorized Infantry division	?	?	0	0	24	15	14
Amphibious Assault division	?	?	0	0	2	2	2
Artillery Division	17	some	5	5	7	2	2

Air-Defense Artillery Division	16	5-6	0	0	0	0	0
Armored Brigade	?	?	2	12	12	8	8
Mechanized Infantry brigade	?	?	0	?	1	7	6
Motorized Infantry Brigade	?	?	0	?	22	21	21
Infantry Brigade	?	?	0	13	0	0	2
Artillery Brigade	some	?	0	20	14	16	17
Air-Defense Artillery Brigade	?	?	5	4	12	?	?
Anti-Tank Brigade	?	?	0	0	1	0	0
Air-Defense Brigade	some	some	0	0	9	21	21
Anti-Tank Regiment	?	?	0	0	4	0	0
Helicopter Regiment	?	2 groups	some	7	0	0	0
Engineer Regiment	50	50	15	0	0	15	13
Signals Regiment	21	?	0	0	0	50	50
Reserves							
Infantry Division	?	30+	?	50 inf, arty, AD, 100 inf, arty reg	30	?	?
Air-Defense Division	?	?	?	some	13	?	?
Logistic support brigade	?	?	?	?	7	?	?
Artillery Division	?	?	?	some	3	?	?
MBT	8,650 (+lt. tank)	7,500-8,000	7,500-8,000	7,060	7,580	6550	7400
T-34	some	0	700	0	0	0	0
T-54	some	some	some	0	0	0	0

Type-59	some	6,000	6,000	5,500	5,000	4000+	4300
Type-69-I	some	200	200	150	0	0	0
Type-79	0	some	some	500	300	300	300
Type-80	0	some	some	0	0	0	0
Type-85	0	0	some	0	0	0	0
Type-88A/88B	0	0	0	900	1,000	500	500
Type-96/88C	0	0	0	0	1,200	1,500	1,500
Type-96G	0	0	0	0	0	0	300
Type-98A/99	0	0	0	10+	80	250	500
Type-99A2	0	0	0	0	0	0	some
Light Tanks	?	2,000	2,000	2,000	1,000	1,000	800
Type-62	some	1,200	800	800	400	400	400
Type-63	some	800	1,200	1,200	600	400	200
Type-05	0	0	0	0	0	200	200
AIFV	?	some	some	4,800 (+ APC)	1,000	1,140	2,350
Type-03	0	0	0	0	0	40	0
Type-04	0	0	0	0	0	300	500
Type-05	?	0	0	some	1,000	200	250
Type-86A	?	0	0	some	1,000	600	700
Type-92	0	0	0	0	0	0	750
Type-92A	0	0	0	0	0	0	150
APC	2,800	2,800	2,800	5,500	3,500+	3300+	2700
Type-531C/D/E	some	some	some	0	0	0	0
YW-534	0	some	some	0	0	0	0
Type-85 (Type 89 or WZ 534)	0	some	some	0	0	0	0
Type-55 (BTR-40)	some	some	some	0	0	0	0
Type-56 (BTR-152)	some	some	some	0	0	0	0

Type-09	0	0	0	0	0	100	100
Type-63	some	some	some	1,800	2,300	2,000	1,650
Type-89I	0	0	0	some	300	300	350
Type-77II	0	0	0	some	200	200	0
Type-92 (WZ 551)	0	0	0	some	600+	600+	500
WZ-523/553	0	0	0	some	100	100	100
BMD-3	0	0	0	100	0	0	0
Artillery	12,800	14,500+	14,500+	15,800+	17,700+	17,700+	12462+
TOWED	some	14,500	14,500	12,000	14,000	14,000	6,176
85mm	some	0	0	0	0	0	0
Type-56	some	0	0	0	0	0	0
100mm	some	some	some	some	some	some	0
Type-59 (M-1944)	?	some	some	some	some	some	0
Type-89	0	some	some	0	0	0	0
122mm	some	some	6,000	some	some	some	3,800.00
Type-54-1 (M-30)	some	some	some	some	some	some	some
Type-60 (D74)	some	some	some	some	some	some	some
Type-83	0	some	some	some	some	some	some
Type-96 (D-30)	some	some	some	0	0	some	some
130mmm	some	some	1,000	some	some	some	234
Type-59 (M-46)	some	some	1,000	some	some	some	234
152mm	some	some	1,400+	some	some	some	2106
Type-54 (D1)	0	some	some	some	some	some	some
Type-56	some	0	0	0	0	0	0
Type-66 (D20)	some	some	1,400	some	some	some	some
Type-83	0	some	some	some	0	0	0
155 mm	0	0	30	300+	150	150	150

Type-88 WAC-21	0	0	30	300+	150	150	150
Self-Propelled	some	some	some	1,200	1,200	1,280+	1,785
122mm	some	some	some	some	700	700+	1,371.00
Type-53I	some	0	0	0	0	0	0
Type-54I	0	some	some	0	0	0	0
Type-70I	0	0	0	some	200	200	200
Type-85	0	0	some	0	0	0	0
Type-89	0	0	0	some	500	500	500
Type-07	0	0	0	0	0	some	596
Type-09	0	0	0	0	0	0	75
152mm	0	some	some	some	500	500	126
Type-83	0	some	some	some	500	500	324
155mm	0	0	0	0	0	80	126
Type—05	0	0	0	0	0	80	126
MRL	4,500	3,800	3,800	2,500	2,400	2,400+	1,770+
107mm	some	some	some	0	0	some	54
Type-63	some	some	some	0	0	some	54
107mm SP	0	0	0	0	0	0	some
122mm	some	some	some	some	some	some	1,620
Type-63	some	0	0	0	0	0	0
Type-81	0	some	some	some	some	some	some
Type-83	0	some	some	0	0	0	0
Type-89 SP	0	0	0	some	some	some	some
130mm	some	some	Some	some	some	some	0
Type-63	some	some	Some	0	0	some	0
Type-70 SP	0	some	Some	some	some	some	0

Type-82	0	0	some	some	some	some	0
Type-85	0	0	some	0	0	0	0
132 mm	some	some	some	0	0	0	0
BM-13-16	some	some	?	0	0	0	0
140mm	some	some	some	0	0	0	0
BM-14-16	some	some	some	0	0	0	0
180mm	some	0	0	0	0	0	0
273mm	0	some	some	some	some	0	0
Type-83	0	some	some	some	some	0	0
284mm	0	some	some	0	0	0	0
Type-74 minelayer	0	some	Some	0	0	0	0
300mm	0	0	0	0	0	some	96
Type-03	0	0	0	0	0	some	96
320mm	some	some	some	some	some	0	0
Type-96 (WS-1)	0	some	some	some	some	0	0
400mm	0	some	some	0	0	some	0
WS-2/Ws-2D	0	0	0	0	0	some	0
425 mm	0	some	some	0	0	0	0
Type-762 mine clearance	0	some	some	0	0	0	0
MORTAR	some	some	some	some	some	some	2,586
81mm	0	0	0	some	some	some	some
Type-W87	0	0	0	some	some	some	some
82mm	some	some	some	some	some	some	some
Type-53(M-37)	some	some	Some	some	some	some	some
Type-67	0	0	0	some	some	some	some
Type-82	0	0	0	some	some	some	some

Type-84	0	some	0	0	0	0	0
YW-304 SP	0	some	0	0	0	0	0
100mm	0	0	0	some	some	some	some
Type-71	0	0	0	some	some	some	some
120mm Type-55	some some	some some	some some	some some	some some	some some	150+ some
Type-W86	0	some	0	0	0	0	0
2S23 NONA-SVK	0	0	0	0	0	100	100
PLL-05	0	0	0	0	0	50	50+
160mm	some	some	some	some	some	some	some
Type-56(M-160)	some	some	some	some	some	some	some
AT	**?**	**some**	**some**	**7,300+**	**7,200+**	**7,460+**	**some**
MSL **MANPATS** HJ-73A	**?** **?** ?	**some** **some** some	**some** **some** some	**7,000** **some** some	**7,200** **some** some	**7,200** **7,176** some	**some** **some** some
HJ-73B	?	0	some	some	some	some	some
HJ-73C	?	0	some	some	some	some	some
HJ-8A	?	some	some	some	some	some	some
HJ-8C	?	0	some	some	some	some	some
HJ-8E	?	0	some	some	some	some	some
Self-Propelled	0	0	0	0	24	24	276
HJ-9	?	0	0	0	24	24	276
AT-5 Sagger	some	0	0	0	0	0	
RCL/RL	some	some	?	some	some	some	3,966+
40mm	some	0	?	0	0	0	0
57mm	some	0	?	0	0	0	0
62mm	?	0	0	some	some	some	some
Type70-1	0	0	0	some	some	some	some

75mm	some	some	some	some	some	some	some
Type-52	?	some	some	0	0	0	0
Type-56	?	some	some	some	some	some	some
82mm	some	some	some	some	some	some	some
Type-65 (B-10)/Type-78	?	some	some	some	some	some	some
90mm	some	some	some	0	0	0	0
Type-51	some	some	some	0	0	0	0
105mm	0	0	0	some	some	some	some
Type-75	0	0	0	some	some	some	some
120mm	0	0	0	0	0	some	some
Type-98	0	0	0	0	0	some	some
GUNS	some	some	some	300+	?	260+	1,730
57mm	some	some	some	0	0	0	0
Type-55	some	some	some	0	0	0	0
76mm	some	some	some	0	0	0	0
Type-54	some	some	some	0	0	0	0
100mm	0	some	some	some	?	some	1,658
Type-73 (T12)/ Type-86	0	some	some	some	?	some	1,308
Type-02	0	0	0	0	0	160	350
120mm	0	0	0	some	?	some	72
Type-89 SP	0	0	0	300+	?	100+	72
AD	**some**	**some**	**some**	**some**	**some**	**some**	**some**
SAM **Self-Propelled**	0	some	some	some	284+	290+ 290	290+
HQ-61(CSA-N-2)	0	some	some	some	24	0	0
HQ-7 (SP)	0	0	0	some	200	200	200
SA-15 Gauntlet (SP)	0	0	0	some	60	60	60

HQ-6D	0	0	0	0	0	0	30
MANPAD	0	some	some	some	some	some	some
HN-5A/B	0	some	some	some	some	some	some
FN-6	0	0	0	0	0	some	some
QW-1	0	0	0	some	some	some	some
QW-2	0	0	0	some	some	some	some
GUNS	15,000	15,000	15,000	some	7,700	7,700+	7,700+
Self-Propelled	0	0	0	0	0	some	some
25mm	0	0	0	0	0	some	some
Type-95/Type-04	0	0	0	0	0	some	some
35mm	0	0	0	0	0	0	some
Type-07	0	0	0	0	0	0	some
37mm	0	0	0	0	0	some	some
Type-88	0	0	0	0	0	some	some
57mm	0	0	0	0	0	some	some
Type-80	0	0	0	0	0	some	some
Towed	some	some	some	some	some	some	some
23mm	0	some	some	some	some	some	some
Type 80-ZSU-23-2	0	some	some	some	some	some	some
25mm	0	0	0	some	some	some	some
Type-85	0	0	0	some	some	some	some
35mm	0	0	0	some	50+	some	some
Type-90 (GDF02)	0	0	0	some	50+	some	some
37mm	0	some	some	some	?	some	some
Type-55	0	0	0	0	0	some	some
Type-63	some	some	some	0	0	0	0
Type-65	0	some	some	some	some	some	some
Type-74	0	some	some	some	some	some	some

57mm	some	some	some	some	some	some	some
Type-59(S60)	some	some	some	some	some	some	some
85mm	some	some	some	some	some	some	some
Type-56 (M1939)	some	some	some	some	some	some	some
100mm	some	some	some	some	some	some	some
Type-59(KS-19)	some	some	some	some	some	some	some
RADAR, LAND	?	?	some	some	some	some	some
Cheetah (Arty)	?	?	some	some	some	some	some
RASIT (Arty)	?	?	some	some	some	some	some
Type-378	?	?	some	some	some	some	some
Y-8 aircraft	?	?	0	2	0	0	0
MSL, Tactical	0	some	some	0	?	some	some
SSM	0	some	some	0	?	some	some
M-9 (CSS-6/DF-15)	0	some	some	0	some	96	108
M-11 (CSS-7/DF-11)	0	0	some	0	some	108	108
HY-1 (CSS-N-2) Silkworm	0	0	0	0	0	some	some
HY-2 (CSS-C-3) Seerseeker	0	0	0	0	?	some	some
HY-4 (CSS-C-7) Sadsack	0	0	0	0	?	some	some
YJ-62C (C-602C)	0	0	0	0	0	some	0
KD-10	0	0	0	0	0	0	some
Helicopters	0	some	62	212+	381	499+	438
Mi-8	0	?	0	30	30	50	50
Mi-17	0	?	0	24	47	22	22
Mi-171	0	?	0	30	45	57	69
Mi-171V	0	0	0	0	0	9	0
Mi-171V5	0	?	0	?	69	42	33
Mi-171V7	0	0	0	0	0	12	24
Mi-172	0	0	0	0	0	8	8
Mi-6	0	?	0	3	3	3	0

Mi-26	0	0	0	0	0	4	4
Z-8/SA-321	0	?	0	4	7	7	17
Z-9/A/B	0	?	30	73	61	0	80
Z-9WA	0	0	0	0	0	100	200
Z-9W	0	0	0	0	0	26	26
Z-10	0	?	0	0	some	0	16
WZ-9	0	?	0	some	31	0	0
SA-342	0	?	8	8	8	0	8
S-70C2	0	?	24	20	19	18	18
Z-11/AS-350	0	?	0	20	53	53	53
HC120/EC120	0	0	0	0	0	0	15
SA-316	0	?	0	0	8	0	8

Source: IISS, IISS Military Balance 1984-1985 to 20012, London, Routledge, 1985 to2012. *Numbers vary widely due to inconsistent reporting and classification. Some reported numbers do not add up in the original source.

Shifts in Force Structure

Figure 5.1 reveals a number of key changes in force structure. The first is a nearly 50% reduction in Group Armies (GA's) within the PLAA. This reduction coincides with a significant decrease in army divisions within the PLAA, much of which can be accounted by the nearly 100% reduction in infantry, artillery, and air defense divisions. In addition, there have been moderate reductions in motorized and armored divisions. The two exceptions to this general trend have been the development of two amphibious divisions and a moderate increase in mechanized divisions.

These reductions in large unit formations also coincide with significant increases in smaller formations such as brigades and specialized regiments. Although reliable data before 1995 on brigade numbers within the PLAA are not available, the trends since 1995 indicate moderate increases in armored and mechanized brigades, as well as significant increases in motorized, artillery, and AD brigades. In addition, there have been considerable increases in the number of specialized signals regiments, and, despite a decline earlier in the 2000's, there are also significant numbers of engineering regiments. These changes indicate that mechanization and specialization have increased relatively within the PLAA.

These general trends toward smaller forces and specialization indicate that the PLAA has and is reforming itself to meet the demands of winning "Local Wars under Conditions of Informatization." The reduction of larger formations, the increase of smaller and specialized formations, and the reduction in the number of GA's enable the creation of a leaner, more agile, and more mobile force capable of quickly moving from one Military Region (MR) within China

to a contingency on any of China's borders. This skill would better enable the PLAA to win local contingencies which, according to the Local Wars construct, would be immediate instances of conflict that would be limited in time and place: the goal of the PLAA would be to create the circumstances needed for a Chinese victory at the negotiating table. In this construct, speed is a requirement of political success, and the PLAA's amphibious divisions and signals regiments play important roles in assuring PLAA speed and agility.

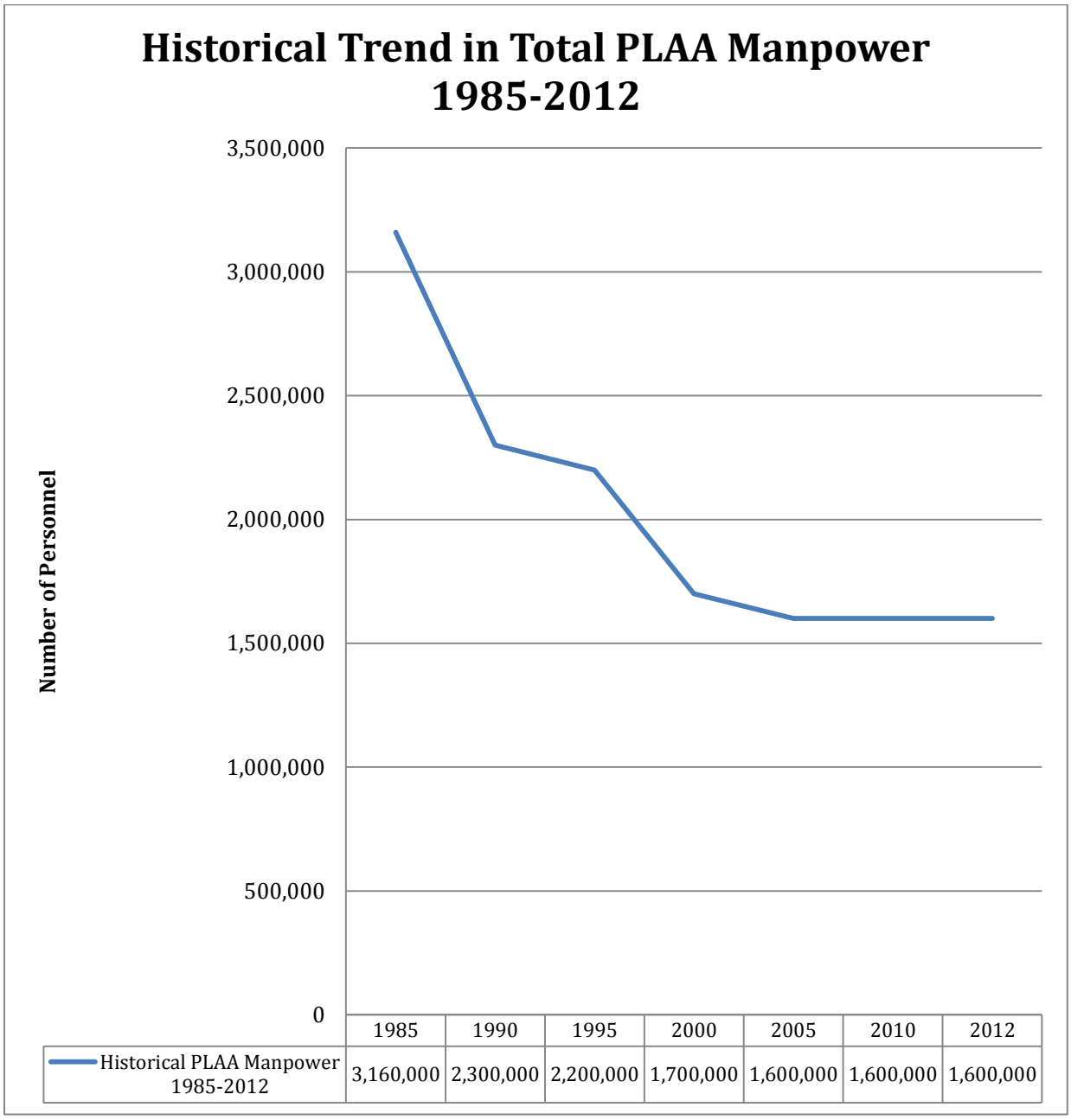
Shifts in Manpower

Figure 5.1 also reveals that there has been a nearly 50% reduction in PLAA manpower since 1985. This manpower trend, in combination with the increase in specialized and smaller formations, indicates a PLAA focus on agility and mobility over mass, a shift that necessitates higher human capital and higher quality equipment.

In addition, manpower reduction, all else equal, indicates lower maintenance costs for the PLAA and thus greater resource availability for modernization efforts and improvements in human capital.

Figure 5.2 displays this manpower trend over the years 1985-2012.

Figure 5.2: Historical Trend in total PLAA Manpower 1985-2012



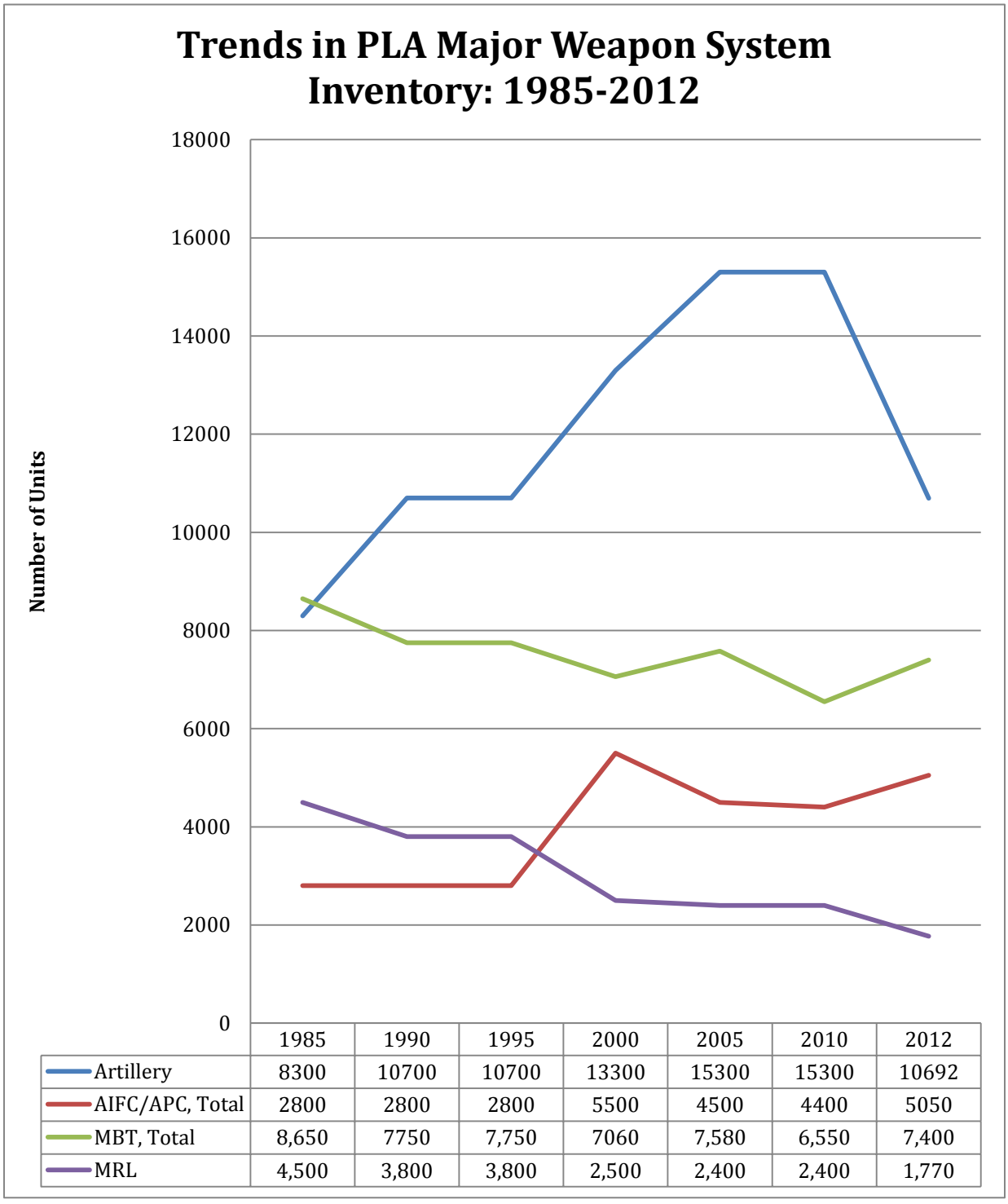
Source: IISS. *Military Balance* 1985-2012.

Trends in Major Equipment Strength

Figures 5.3 and 5.4 illustrate the historical changes in the PLAA's inventory of MBT's, AIFV/APC's, Artillery, and Multiple Rocket Launchers (MRL's). These systems have been chosen for analysis both because they are integral to any land force's combat power but also because there exists consistent data on Chinese holdings of these systems. While it would be useful to include PLAA AD holdings, there is simply not enough data on AD to meaningfully analyze it quantitatively.

Figure 5.3 shows that the number of MBT's and MRL's in the PLAA have dropped significantly since 1985, and the number of artillery pieces has also significantly dropped since its peak in 2010. In contrast, the number of AIFV/APC's has markedly increased during this time period, an outcome that is unsurprising given the increased mechanization within the PLAA's force structure.

Figure 5.3: Summary Trends in PLA Major Weapon System Inventory: 1985-2012



	1985	1990	1995	2000	2005	2010	2012
Artillery	8300	10700	10700	13300	15300	15300	10692
AIFC/APC, Total	2800	2800	2800	5500	4500	4400	5050
MBT, Total	8,650	7750	7,750	7060	7,580	6,550	7,400
MRL	4,500	3,800	3,800	2,500	2,400	2,400	1,770

Source: IISS. *Military Balance* 1985-2012.

Figure 5.4 compares PLAA weapon system numbers to the size of the PLAA's modern weapon system inventory. Such a comparison is necessary in order to better ascertain the PLAA's combat power as well as to track its development towards a force capable of winning Local Wars.

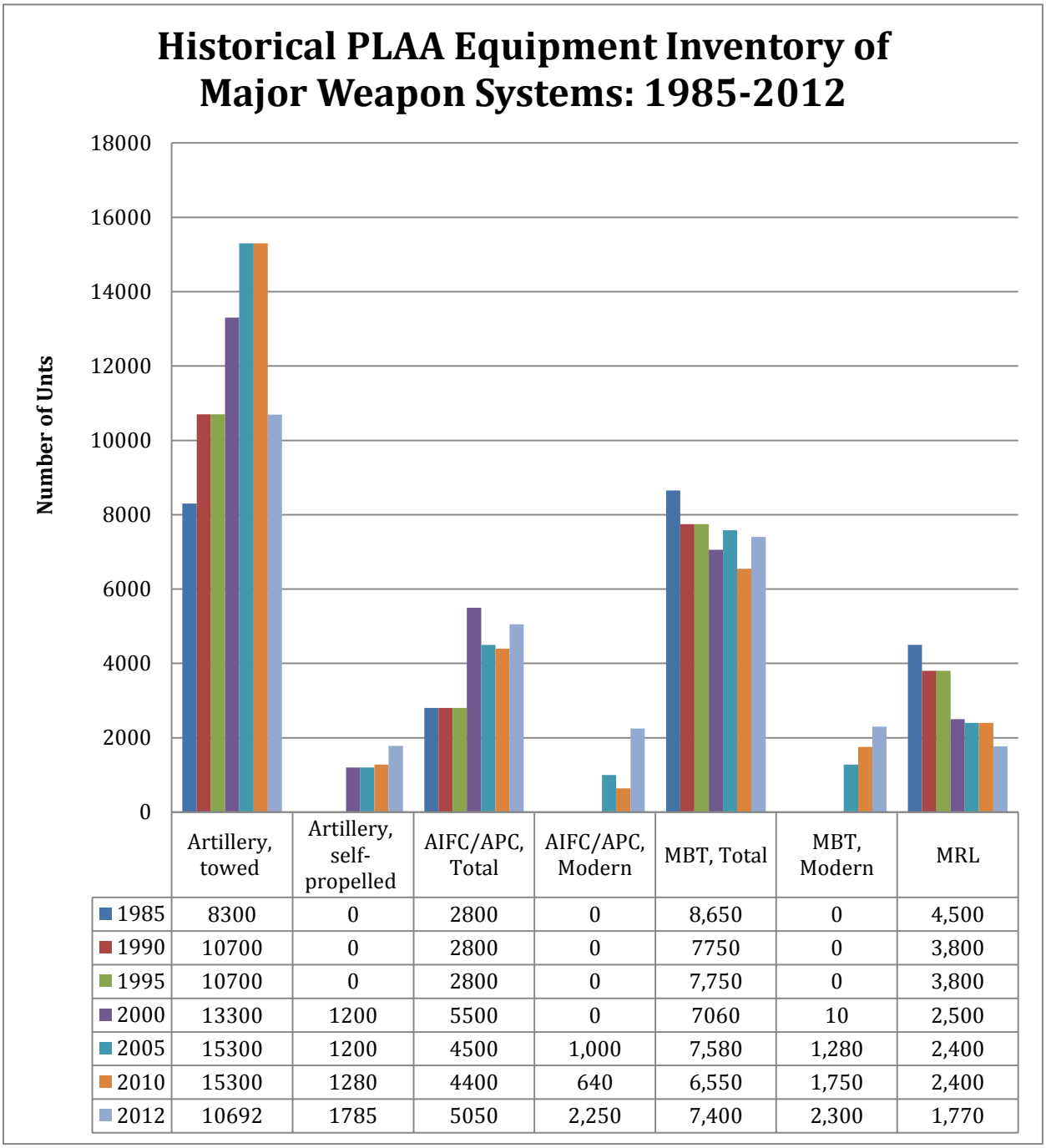
As Figure 5.4 shows, the relative reduction in major PLA weapon systems shown in Figure 5.3 coincides with an overall increase in the number of modern systems in the PLAA inventory. Consequently, the PLAA, while reducing its overall force size, is replacing large numbers of its obsolete equipment with much more capable weapon systems.

This practice has implications for the PLAA's tactics and strategy. The Local Wars construct requires the PLAA to rapidly overwhelm a regional adversary before political dynamics end the conflict. Moreover, in that short time, the PLAA must obtain the military advantages necessary to ensure success in subsequent negotiations. A more modern force, especially one with modern equipment concentrated into elite units, enables the PLAA to conduct this type of warfare while still in the process of modernization. In fact, the DOD's *Military and Security Developments Involving the People's Republic of China 2011* (2011 DOD Report) indicates that the PLAA is deploying its modern weaponry in this manner with a special focus on units suitable for a Taiwan contingency such as the PLA's amphibious divisions.[157]

A Few notes regarding weapon systems considered modern:

- Modern MBT's are tanks with sufficient armor, firepower, and electronics to hold third generation or near-third generation capabilities. Third generation tanks have composite and reactive armor, typically fire rounds of 120mm or larger, and have gun-stabilizers and advanced fire control electronics.
- Modern AIFV/APC's are all personnel carriers capable of keeping pace with third generation tanks and surviving in a comparable battlefield environment.
- Self-propelled artillery comprises artillery pieces that are built into motorized chasses and capable of movement without the aid of supporting vehicles.
- MRL's are not differentiated between towed and self-propelled because reliable data on self-propelled MRL's is not available.

Figure 5.4: Historical PLAA Equipment Inventory of Major Weapon Systems: 1985-2012



	Artillery, towed	Artillery, self-propelled	AIFC/APC, Total	AIFC/APC, Modern	MBT, Total	MBT, Modern	MRL
1985	8300	0	2800	0	8,650	0	4,500
1990	10700	0	2800	0	7750	0	3,800
1995	10700	0	2800	0	7,750	0	3,800
2000	13300	1200	5500	0	7060	10	2,500
2005	15300	1200	4500	1,000	7,580	1,280	2,400
2010	15300	1280	4400	640	6,550	1,750	2,400
2012	10692	1785	5050	2,250	7,400	2,300	1,770

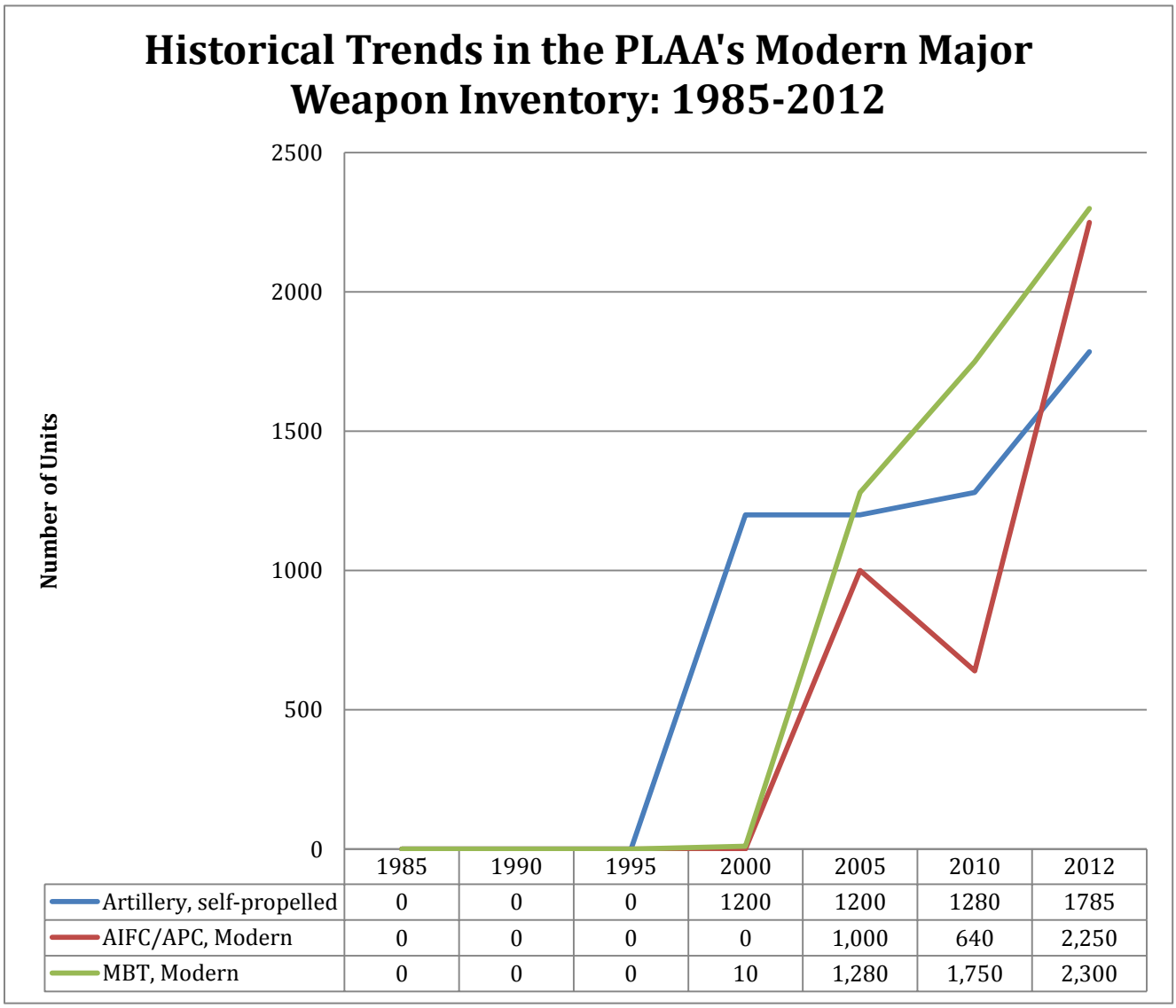
Source: IISS. *Military Balance* 1985-2012.

Equipment Modernization

The PLAA's major weapon system modernization has occurred through a combination of discarding obsolete equipment and procuring modern, information technology-enabled equipment. The larger effect of the PLAA's modernization has been to mechanize a force once heavily comprised of infantry and motorized forces and to integrate weaponized information technology into mechanized systems. The PLAA's efforts to develop third generation armored systems, as well as a high-end MBT's in the Type-99, have led to concentrations of powerful armored formations. These concentrations of modern combat power, in the regions opposite Korea and Taiwan, as well as in Beijing, are seen by some military analysts as forming quick reaction forces for the most likely contingencies the PLAA may have to face. [158]

Figure 5.5 displays the PLAA's procurement of modern main weapon systems. The procurement began with artillery in 1995 and included MBT's and AIFV/APC's in 2000. Over the last two decades, the modernization of the PLAA has continued at sustained pace.

Figure 5.5: Historical Trends in the PLAA's Modern Major Weapon Inventory: 1985-2012



	1985	1990	1995	2000	2005	2010	2012
Artillery, self-propelled	0	0	0	1200	1200	1280	1785
AIFC/APC, Modern	0	0	0	0	1,000	640	2,250
MBT, Modern	0	0	0	10	1,280	1,750	2,300

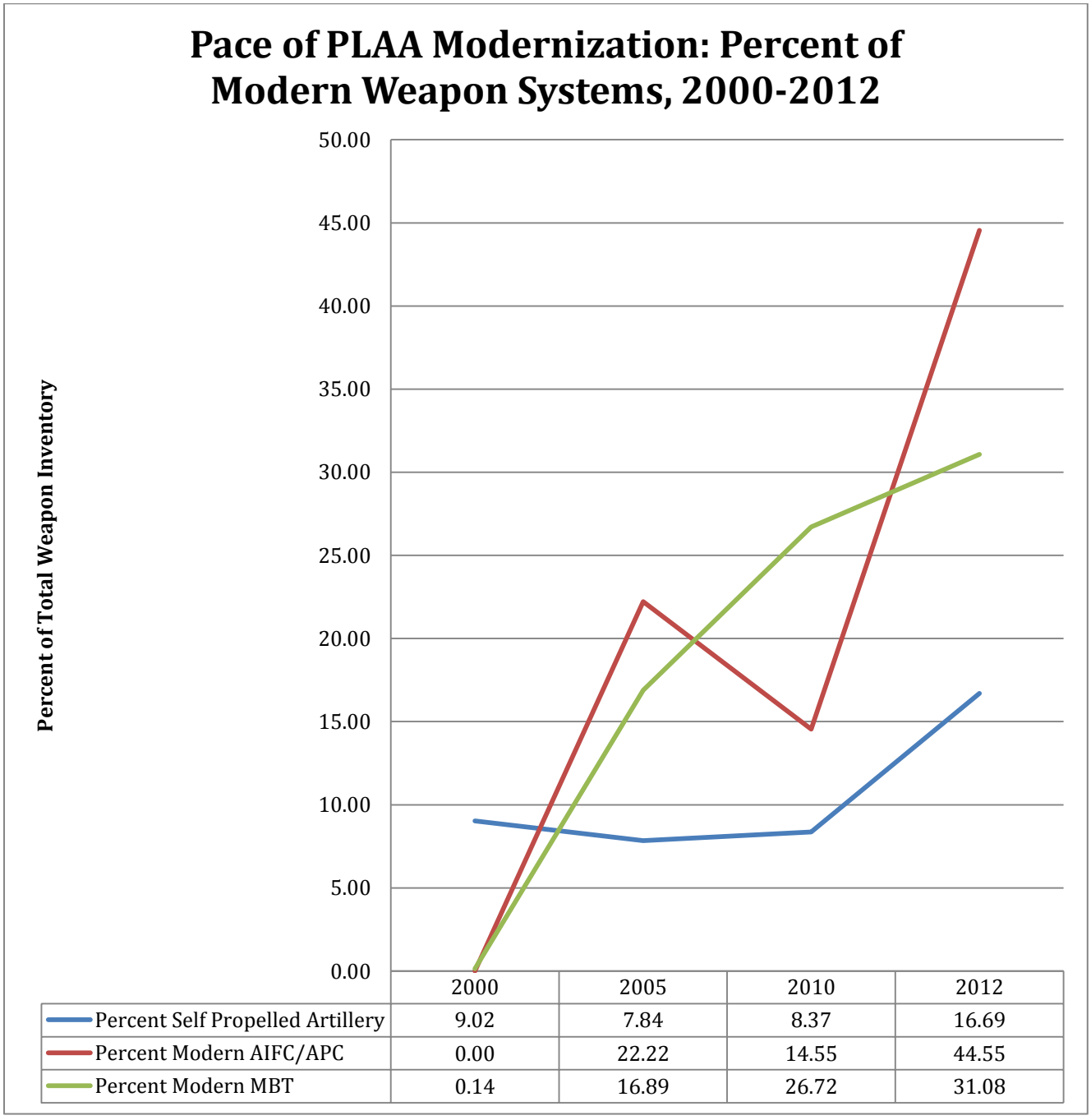
Source: IISS. *Military Balance* 1985-2012.

Figure 5.6 provides indicators of the PLAA's modernization progress. As the data indicate, the PLAA has experienced a sharp rise in the percentage of its equipment that is considered modern. Approximately 17% of all artillery is self-propelled, 31% of MBT's are third generation, and 45% of AIFV/APC's are modern. These numbers are in stark contrast to 9%, 0%, and 0.1%, respectively, in the year 2000. Consequently, the PLAA has engaged in an effective modernization program that has absolutely and relatively increased the modern equipment of the PLAA, thus significantly altering the composition of the PLAA.

The PLAA's ability to successfully fight Local Wars, as well as its combat power, is strongly affected by the composition of its ground force. This metric enables the observer to track PLAA modernization progress, determine how much or which part of the PLAA is capable of fighting Local Wars, and, thus, observe indicators of the PLA's total combat power. However, it is important to reiterate that quantitative measures do not show the intangibles of leadership, morale, training, and combat skill and thus, alone, cannot provide a full picture of combat power.

In the case of the PLAA, a relatively more modern force, assuming the personnel manning that force have been adequately trained and led, enables more demanding strategic and tactical maneuvers and battle plans. The ability to rapidly shift MR's and then fight in a border region in good order requires excellent communications, reliable equipment, and potent combat power concentrated in relatively smaller formations. Moreover, given the time sensitivity predicted by the Local Wars construct, it is unlikely that slow-moving, obsolete secondary or tertiary echelons will reach the battlefield in time to determine diplomatic outcomes. Consequently, the level of modernization of the PLAA has direct effects both on the combat power of the PLAA and also on the type of missions it can conduct and the number of adversaries it can simultaneously fight or deter.

Figure 5.6: Pace of PLAA Modernization: Percent of Modern Weapon Systems, 2000-2012



Source: IISS. *Military Balance* 1985-2012.

Shifts in Unit Training

The previous sections provided quantitative data regarding the PLAA's force structure, manpower, and weapon system holdings. It must be noted that such figures do not account for the vital combat power elements of morale, skill, and leadership. This section provides information on the PLAA's training, and thus indirectly estimates these intangible attributes.

The last decade has seen significant changes in PLAA training that indicate a shift towards more realistic training, joint operations, and trans- and multi-MR operations: the latter two are capabilities needed to fulfill the requirements of the Local Wars doctrine. The most recent edition of the *Outline of Military Training and Evaluation* has promoted unscripted training based on facing an opposition force,[159] and multiple PLAA exercises during the decade required forces to mobilize across long distances that involved multiple MR's. Of one recent, large-scale PLAA exercise, Mission Action 2010, the DOD writes:

> "In October 2010, the PLA conducted its first Group Army-level exercise, which it called ―MISSION ACTION (SHIMING XINGDONG). The primary participants from the Beijing, Lanzhou, and Chengdu Military Regions practiced maneuver, ground-air coordination, and long-distance mobilization via military and commercial assets as they transited between MRs. Given that these MRs are located along China's land borders, the exercise scenario was likely based on border conflict scenarios. In addition to providing large-scale mobility and joint experience, the exercise allowed PLA command staff to test their ability to plan and execute a large joint campaign while practicing communication between command elements across dispersed forces. This skill is critical to responding to crises along China's periphery."**160**

The DOD's assessment illustrates a PLAA in the process of testing and refining its training, combat skills, and leadership for the likely scenarios predicted by the Local Wars doctrine.

Conclusion

The trends in this chapter reflect the changing character of the PLAA as the force improves its ability to fight wars "under conditions of informatization" and thus its ability to quickly maneuver forces throughout the country in response to regional contingencies.

All of the shifts in force structure, manpower, and equipment indicate an active PLAA effort to become capable of winning Local Wars. The reduction of large formations, the development of smaller and more specialized formations, the reduction in manpower, and the increasing modernity of the PLAA's equipment indicate efforts to achieve this goal. Moreover, the PLAA is enabling these tangible aspects of military modernization with the necessary training. The quantitative data presented indicate that, while the PLAA has yet to establish a truly modern force, it has made decisive efforts to transform itself and improve its ability to respond to regional contingencies. However, it is important to note that the effects of these modernization efforts have not been evenly spread across the PLAA. For example, the 2011 DOD Report states that "much of the observed upgrade activity has occurred in units with the potential to be involved in a Taiwan contingency."[161]

The quantitative comparisons presented here do not and cannot provide all of the indicators needed to adequately judge intangible qualities such as combat skill, leadership, and morale, and therefore, alone cannot predict PLAA capabilities. However, the data does provide indicators which chart the development of the PLAA and the trends which influence its ability to fight Local Wars. These indicators – force structure, manpower, and equipment – indicate that the PLAA is becoming more capable of fulfilling the missions demanded by the Local Wars doctrine.

Chapter 6: The PLA Navy

The PLA Navy (PLAN) has seen impressive transformation and growth since the 1980's. A "fortress navy" once dependent on land-based support and comprised mostly of patrol craft has begun shifting towards a force more capable of independent action, comprised of major combatants, and better able to project power along China's periphery in accordance with the Local Wars doctrine.

PLAN Service Strategy

The PLAN's modernization vision developed during the 1980's, prior to the 1993 promulgation of the Local Wars doctrine. Pioneered by Admiral Liu Huaqing, the PLAN devised "Offshore Defense" (alternatively translated as "Near Seas Defense") as a successor to the previous "Coastal Defense" PLAN mission.

The coastal defense doctrine had developed a PLAN capable of conducting a defense of China's coasts from the Soviet Pacific fleet in what was predicted to be a largely land-based war.[162] In contrast, offshore defense envisioned a PLAN structured to conduct combat in an area bounded by the first island chain. Proponents of the new doctrine argued that it was necessary to extend China's maritime active defense perimeter in order to protect China's vulnerable maritime flank and to reduce the efficacy of adversary long-range precision strike.[163] In order to achieve these objectives, the PLAN needed the ability to operate at longer ranges, to rapidly concentrate combat power, and to be capable of defeating an opposing navy in the open ocean. These capabilities in turn necessitated the procurement of more modern vessels and the personnel qualified to crew them.

This theory behind offshore defense fit well into the Local Wars doctrine when the latter was promulgated in 1993. The focus on warfare in local areas, high technology capabilities, and modern vessels all fit into the CMC's overarching concept.

Figure 6.1 below illustrates the US DOD's understanding of the 1st and 2nd Island Chains.

Figure 6.1: U.S. DOD representation of the 1st and 2nd Island Chains

Source: DOD. Military and Security Developments Involving the People's Republic of China 2012. Washington, DC: Office of the Secretary of Defense. 40. http://www.defense.gov/pubs/pdfs/2012_CMPR_Final.pdf

Shift in Force Structure, Equipment Composition, and Manpower

The result of the PLAN's modernization and development along these doctrinal lines has been a sustained shift from a navy of large numbers of single-mission vessels, mostly patrol craft, to a navy boasting significant numbers of modern major combatants, as well as modernized patrol craft. The PLAN has modernized by changing its force structure to meet new doctrinal needs: proliferating the categories of ships under its command and developing new capabilities and their necessary systems.

Regarding its equipment holdings, the PLAN has modernized its weapon systems in a manner similar to the PLAA. Large numbers of obsolete vessels, mostly coastal combatants, have been discarded and replaced by modernized imported and indigenously-manufactured ocean-going combatants. New PLAN frigates and destroyers are multi-mission combatants capable of effectively conducting a variety of missions, in stark contrast to their single-mission predecessors. Additionally, the PLAN is replacing its patrol craft with modern variants such as the *Houbei,* which has a wave-piercing hull design and can carry eight anti-ship cruise missiles. Furthermore, the PLAN's procurement of new diesel and nuclear-powered submarines has significantly modernized its undersea combatant arsenal. In addition, the sea trials of the Ex-*Varyag* carrier, as well as flight-testing of the J-15 (Su-33) carrier-fighter, indicate future PLAN developments toward greater power-projection capabilities.

Manpower policies cannot be neglected, and the PLAN has not done so. In addition to reducing its manpower, it has conducted exercises and deployments that are developing the skills necessary to perform offshore defense and producing experiences vital for a service that has little combat experience.

The combination of these modernization and force development efforts is an increase in the capabilities of the PLAN. In particular, the PLAN has recently augmented its anti-surface warfare (AsuW), naval air defense, and force projection capabilities.[164] In contrast, one area in which the PLA lacks significant improvement is its anti-submarine warfare capability. However, the PLAN has been shifting rotary wing assets into the ASW role to mitigate this deficiency. Thus, overall, the PLAN's force modernization trends are augmenting China's naval capabilities and improving the PLAN's ability to react to regional contingencies in line with the Local Wars doctrine.

Shift in Force Structure

Figure 6.2 below displays these trends in quantitative terms. The period 1985-2012 is a story of the PLAN rapidly discarding obsolete coastal naval assets and procuring, by foreign import if necessary, advanced major surface combatants capable of creating a hazardous environment in East Asia for adversary surface forces. The specific balance between modern and non-modern PLAN assets will be displayed in later graphs.

Figure 6.2: Force Structure of the PLA Navy 1985-2012

	1985	1990	1995	2000	2005	2010	2012
Manpower	350,000	295,000	300,000	260,00	295,000	255,000	255,000
Navy	350,000	260,000	260,000	220,000	255,000	215,000	215,000
Conscript	?	35,000	40,000	40,000	40,000	40,000	40,000
Reserve	?	?	?	?	?	?	?
Naval Aviation	some	25,000	25,000	26,000	26,000	26,000	26,000
Marines	some	6,000	5,000	5,000	10,000	10,000	10,000
Submarines	103	93	49	65	68	65	71
Strategic (SSBN/SLBM trial)	1	1	0	1	1	3	4
Golf (SLBM trial)	1	1	1	1	1	1	1
Xia (Type 092)	0	0	0	0	1	1	1
Jin (Type 094)	0	0	0	0	0	2	2
Tactical	102	92	48	64	67	62	68
SSN	2	4	5	5	5	6	5
Han (Type 091)	2	4	5	5	5	4	3
Shang (Type-093)	0	0	0	0	0	2	2
SSG	0	1	1	1	1	1	1
Romeo (Type S5G)	0	1	1	1	1	1	1
SSK	100	87	42	57	61	54	52
Kilo (RF Type EKM 636)	0	0	0	3	2	10	10
Kilo (RF Type EKM 877)	0	0	0	2	2	2	2
Ming (Type-035)	0	3	0	2	3	3	4
Ming (Type-035G/B)	0	0	9	15	16	16	16
Romeo (E3SB)	79	85	34	35	36	8	0
Song (Type 039)	0	0	0	1	3	13	16
Yuan (Type 041)	0	0	0	0	0	2	4
W-class	21	0	0	0	0	0	0
Destroyers	14	19	18	20	21	28	26
Guided Missile Destroyer	14	0	18	20	21	28	26
Sovremmeny	0	0	0	1	2	4	4
Luda III (Type-051GII)	0	0	0	1	1	1	1
Luda (Type-051)	10	16	15	13	11	10	9
Luda (Type-051DT)	0	0	0	0	2	3	2
Luda II (Type-051G)	0	1	2	2	2	1	1
Luhai	0	0	0	1	1	1	1
Luhu	0	0	1	2	2	2	2

Luyang I	0	0	0	0	0	2	2
Luyang II	0	0	0	0	0	2	2
Luzhou	0	0	0	0	0	2	2
Anshan (Soviet Gordy)	4	2	0	0	0	0	0
Frigates	22	37	37	40	42	52	52
Guided Missile Frigate	17	32	35	40	42	52	52
Jianghu I (Type-053H)	11	13	13	26	26	11	9
Jianghu II (Type-053H1)	0	9	9	1	1	9	8
Jianghu III (Type-053H2)	0	2	5	3	3	3	3
Jianghu IV (Type-053H1Q)	0	2	2	0	0	1	1
Jianghu V (Type-053H1G)	0	0	0	0	0	6	6
Jiangwei I (Type-053H2G)	0	0	3	4	4	4	4
Jiangwei II (Type-053H3)	0	0	0	6	8	10	10
Jiangdong	2	2	1	0	0	0	0
Chengdu	4	4	2	0	0	0	0
Jiangkai I (Type-054)	0	0	0	0	0	2	2
Jiangkai II (Type--054A)	0	0	0	0	0	6	9
Patrol and Coastal Combatants	48	915	870	368	331	253	211+
PCC	48	110	100	118	109	120	75
Haijui	0	10	4	2	2	2	3
Haiqing	0	0	0	20	19	25	22
Kronshtadt	20	10	0	0	0	0	0
Hainan	28	90	96	96	88	93	50
PB	0	290	350	111	87	50	34+
Haizui	0	0	0	11	8	15	some
Shanghai	305	290	300	100	79	35	some
Huludao	0	0	5	0	0	0	0
Shantou	0	0	45	0	0	0	0
PCG	0	215	217	93	96	83+	102+
Houkou	0	0	0	30	31	0	0
Houxin (Type-037/IG)	0	0	6	20	22	16	20
Huang	0	0	1	5	5	0	0
Huangfeng/Hola (Type-021)	0	125	120	38	38	0	11
Hegu/Hema	0	90	90	0	0	0	0
Houjian	0	0	0	0	0	7	6
Houbei (Type-022)	0	0	0	0	0	60+	65+
PHT	290	160	100	16	9	0	0
Huchuan	140	100	100	16	9	0	0

P-4	80	0	0	0	0	0	0
P-6	70	60	0	0	0	0	0
Haikou	3	0	0	0	0	0	0
Swatow	30	0	0	0	0	0	0
Shandong	3	0	0	0	0	0	0
?	56	0	0	0	0	0	0
Mine warfare	23	56	121	39	34	68	75
Mine Sweeper Coastal	?	?	81	57	55	8	23
Lienyun	?	?	80	50	50	0	0
Wosao	?	?	1	7	5	4	16
Wochi	0	0	0	0	0	4	6
Wozang	0	0	0	0	0	0	1
Mine Sweeper Drone	?	60	60	4	4	46	49
Futi	0	0	0	0	0	46	46
Other	?	60	60	4	4	0	3
Mine Sweeper Inshore	?	?	4	4	4	0	0
Shanghai	?	?	1	3	1	0	0
Wochang	?	?	3	3	3	0	0
Mine Sweeper Ocean	23	35	35	27	24	14	16
T-43	23	35	35	27	24	14	16
Minelayer	?	?	1	1	1	1	1
Belejan	?	?	1	0	0	0	0
Wolei	?	?	0	1	1	1	1
Amphibious	73	58	50	70	50	244	238
Landing Ship Medium	35	42	34	41	31	56	61
Yubei	0	0	0	0	0	0	10
Yudao	?	1	4	1	1	1	0
Yudeng	?	0	0	0	1	1	1
Yuhai	?	0	0	12	12	13	10
Yuliang	?	30	30	28	17	31	30
Yuling	?	1	0	0	0	0	0
Yunshu	0	0	0	0	0	10	10
Hua (US LSM-1)	0	10	0	0	0	0	0
Landing Ship Tank	18	16	16	18	19	27	26
511-1152	18	0	0	0	0	0	0
Shan	0	13	13	3	3	0	0
Yukan	0	3	3	7	7	7	7
Yuting	0	0	0	8	9	10	9

Yuting II	0	0	0	0	0	10	10
Landing Craft	470+	400	400	285+	285+	160	151
LCU	0	0	0	0	0	130	120
LCM	0	0	0	0	0	20	20
LCAC	0	0	0	0	0	0	1
UCAC	0	0	0	0	0	10	10
Logistics and support	46+	118	164	159	163	205	205
ABU (sea-going buoy tender)	0	0	0	0	0	7	7
AF/AK (storage)	23	1	14	14	14	23	23
AG (miscellaneous Auxiliary)	0	0	0	0	0	6	6
AGB (Icebreaker)	0	3	4	4	4	4	4
AGI (intelligence collection vessel)	0	0	0	0	0	1	1
AGM (Space and Missile Trackign)	0	0	0	0	0	5	5
AGOR (oceanographic research)	0	35	33	33	33	5	5
AGS (Survey Ship)	0	0	0	0	0	6	6
AH (hospital ship)	0	0	0	2	6	1	1
AO (tanker)	0	3	2	2	3	5	5
AOT (tanker and transport)	23	25	33	33	33	50	50
AORH (Tanker with helicopter)	0	0	0	0	0	5	5
AR/ARS (repair/rescue ship)	0	2	2	2	2	2	2
AS (submarine support)	0	0	0	10	10	8	8
ASR (submarine rescue)	0	0	2	1	1	1	1
ATF (tug, ocean going)	0	23	25	25	25	51	51
AWT (Water Tanker)	0	0	0	0	0	18	18
Transport	?	17	30	30	30	0	0
AX (Training Ship)	?	1	1	1	2	2	2
YDG (Degaussing Ship)	0	0	0	0	0	5	5
Naval Aviation							
Bombers	150+	180+	155+	75	68	50	50
H-5/ F-5/ F-5B	100	130	130	50	50	20	20
H-6	some	50	25	7	0	0	0
H-6D	0	some	some	18	18	30	30
IL-28	50	0	0	0	0	0	0
Fighter	600	600	600	378	74	84	72
J-5	some	some	some	0	0	0	0
J-6	some	some	some	250	0	0	0
J-7 (MiG-21)	some	some	some	66	26	36	24
J-8/J-8A/J-8B/J-8D Finback	0	0	some	52	42	some	0

J-8IIA	0	0	some	0	12	0	0
J-8F	0	0	0	0	0	some	24
J-8H	0	0	0	0	0	0	24
Fighter Ground Attack	0	100	100	50	250	138	172+
JH-7	0	0	0	20	20	84	120
Q-5 Fantan	0	100	10	30	30	30	0
Su-30Mk2	0	0	0	0	0	0	0
J-6 (MiG-19S)	0	0	0	0	200	0	0
J-10A/s	0	0	0	0	0	0	24
J-11B	0	0	0	0	0	0	4+
Su-30MK2	0	0	0	0	0	24	24
ASW	8	14	20	4	4	4	4
PS-5 (SH-5)	0	4	5	4	4	4	0
Be-6 Madge	8	10	15	0	0	0	0
ISR	some	some	some	7	7	13	7
H-5	some	some	some	0	0	0	0
HZ-5 Beagle	0	0	0	7	7	7	7
Y-8J/Y-8JB	0	0	0	0	0	6	0
ELINT	0	0	0	4	4	4	7
Y-8X	0	0	0	4	4	4	3
Y-8JB	0	0	0	0	0	0	4
AEW&C	0	0	0	0	0	0	6
Y-8J	0	0	0	0	0	0	4
Y-8W	0	0	0	0	0	0	2
Tanker	0	0	0	0	3	3	3
HY-6	0	0	0	0	3	3	0
H-6DU	0	0	0	0	0	0	3
Transport	60	60	some	68	66	66	66
Y-8 (An-12)	?	?	0	0	4	4	4
Y-5 (An-2)	?	?	0	50	50	50	50
Y-7 (An-24)	?	?	0	4	4	4	4
Y-7H (An-26)	?	?	0	6	6	6	6
Y-8	?	?	some	6	0	0	0
Yak-42	?	?	0	2	2	2	2
Training	?	?	some	73	73	122	106+
JJ-5	?	?	some	0	0	0	0
JJ-6 (Mig-19)	?	?	some	16	16	14	14
JJ-7	?	?	0	4	4	4	4

PT-6 (CJ-6)	?	?	0	53	53	38	38
HJ-5	0	0	0	0	0	33	5
HY-7	0	0	0	0	0	21	21
JL-8 (K-8)	0	0	0	0	0	12	12
JL-9	0	0	0	0	0	0	12+
Helicopters	some	68	68	35	51	78	104+
SAR	some	68	53	21	27	40	2
SA-321	0	12	0	9	15	15	0
Z-5	some	50	40	0	0	0	0
Z-8/Z-8A	0	0	3	12	12	20	0
Z-8S	0	0	0	0	0	2	2
Z-8JH	0	0	0	0	0	3	0
Z-9	0	6	10	0	0	0	0
Z-9C	0	0	0	12	0	0	0
Anti-Submarine Warfare	12	0	15	4	8	13	38
Super Frelon	12	0	0	0	0	0	0
SA-321	0	0	15	0	0	0	0
Ka-28 (Ka-27PL) Helix A	0	0	0	4	8	13	13
Z-9C (AS-565SA)	0	0	0	0	0	0	25
Assault	0	0	0	0	8	25	0
Z-9C (AS-565SA)	0	0	0	0	8	25	0
Support	0	0	0	10	8	8	0
Mi-8	0	0	0	10	8	8	0
AEW	0	0	0	0	0	0	2
Ka-31	0	0	0	0	0	0	2
Transport	0	0	0	0	0	0	46
SA-321 Super Frelon	0	0	0	0	0	0	15
Z-8/Z-8A	0	0	0	0	0	0	20
Z-8JH	0	0	0	0	0	0	3
Mi-8 Hip	0	0	0	0	0	0	8
Missile, Tactical	?	some	some	some	some	some	some
YJ-6 (CAS-1)	?	0	0	0	some	0	0
YJ-61 (CAS-1),improved	?	0	0	0	some	some	some
YJ-8K (CSS-N-4)	?	0	0	0	some	some	some
YJ-83 (CSSC-8)	0	0	0	0	0	some	some
YJ-6/C-601	?	some	some	some	some	0	0
YJ-61/C-611	?	0	0	some	some	0	0
YJ-81/C-801K	?	0	0	some	some	0	0

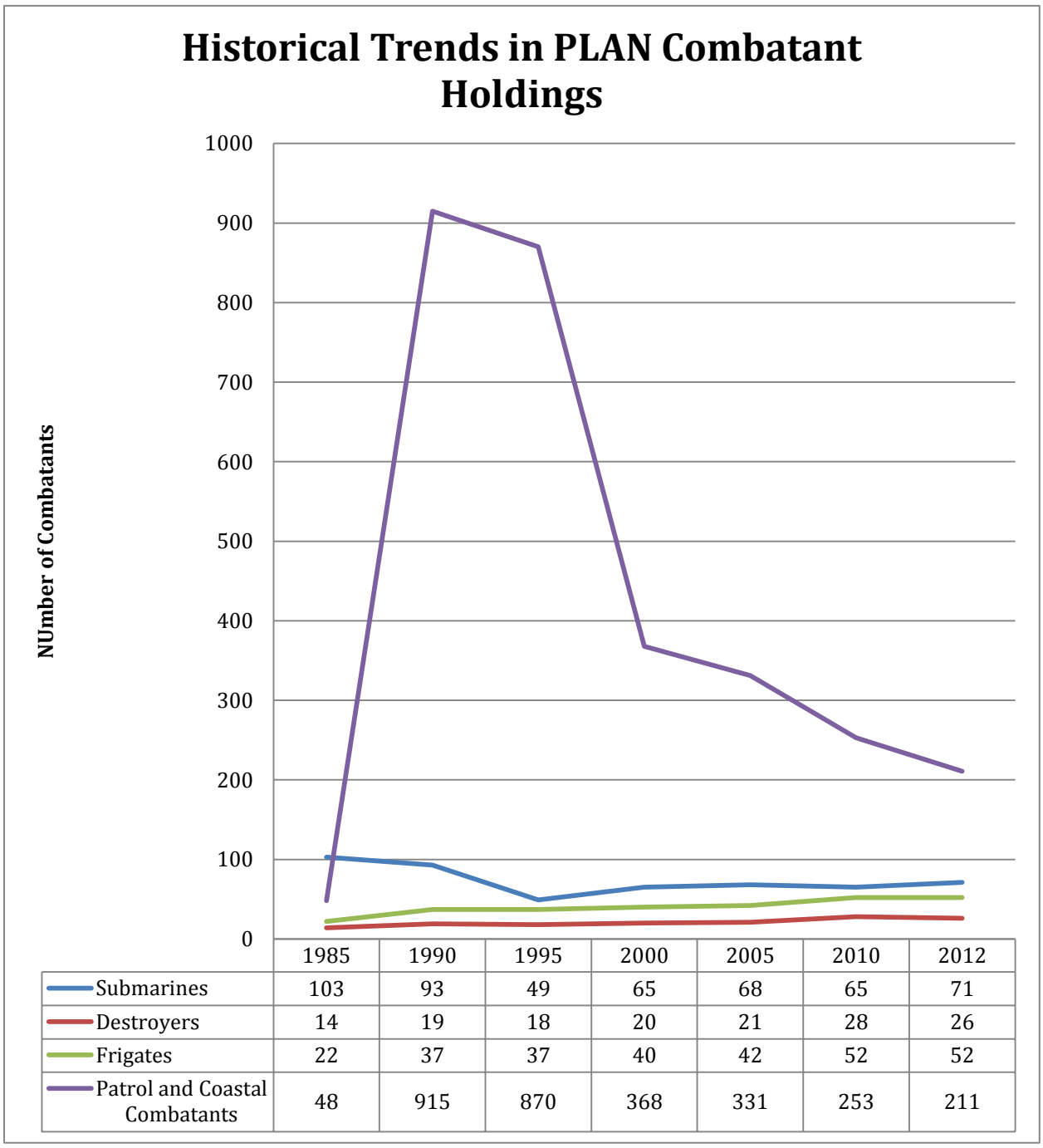
Kh-31A (AS-17B Krypton)	0	0	0	0	0	0	some

Source: International Institute for Strategic Studies (IISS), *The Military Balance 1984–1985* and various volumes ending with *The Military Balance 2012* (London: Routledge, 1985–2012). Some reported numbers do not add up in the original source.

Figure 6.2 displays the significant changes in force structure between 1985 and 2012. The most significant change is the relative growth of major combatants in the PLAN. The period 1990-2000 saw significant reductions in coastal craft while, throughout the period, the numbers of major surface combatants increased. The PLAN submarine force suffered an initial decrease in force size during the period as obsolete submarines were retired but has regained much of its number. These changes indicate the doctrinal shift from coastal combat by swarms of single-mission ships to combat within the first island chain by major combatants.

Figures 6.3 and 6.4 aggregate the quantitative data presented in Figure 6.2. Figure 6.3 places the data in a line graph format to better illustrate force structure trends. Figure 6.4 demonstrates the historical PLAN combatant holdings and compares them with the PLAN's modern combatants.

Figure 6.3: Trends in PLAN Combatants Holdings

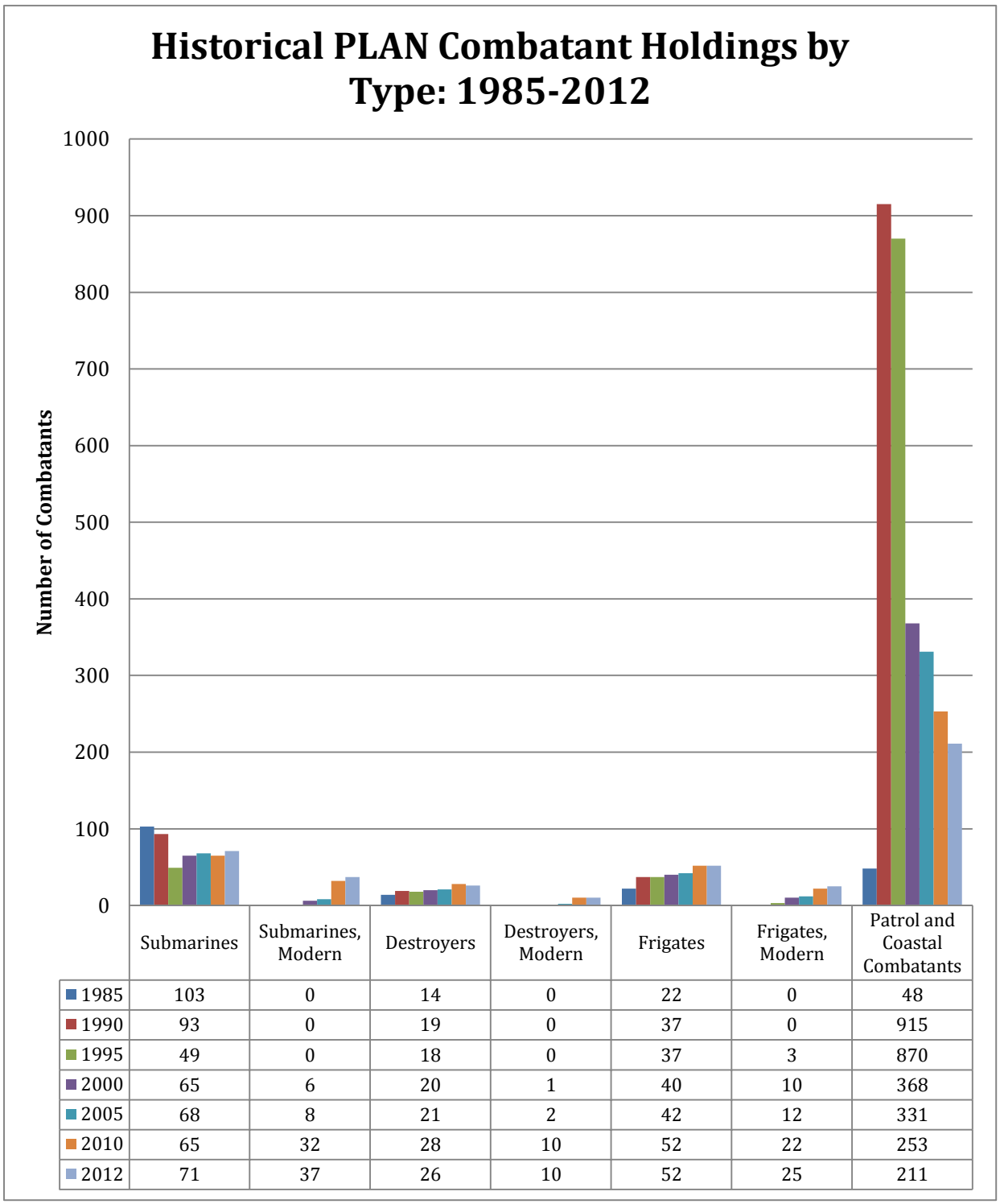


	1985	1990	1995	2000	2005	2010	2012
Submarines	103	93	49	65	68	65	71
Destroyers	14	19	18	20	21	28	26
Frigates	22	37	37	40	42	52	52
Patrol and Coastal Combatants	48	915	870	368	331	253	211

Source: IISS. *Military Balance* 1985-2012.

Figure 6.3 illustrates the significant decrease in PLAN coastal combatants and a roughly 30% decrease in its submarine holdings. These losses were compensated by increases in major surface combatants such as frigates and destroyers. In addition, and Figure 6.4 will show, much of the increase in major surface combatants is due to increases in modern equipment. Consequently, the force structure indicates a navy in transition towards deeper water operations by smaller numbers of multi-mission ships. Figure 6.4 shows these trends by comparing absolute combatant numbers to modern combatant numbers.

Figure 6.4: Historical PLAN Combatant Holdings 1985-2012



	Submarines	Submarines, Modern	Destroyers	Destroyers, Modern	Frigates	Frigates, Modern	Patrol and Coastal Combatants
1985	103	0	14	0	22	0	48
1990	93	0	19	0	37	0	915
1995	49	0	18	0	37	3	870
2000	65	6	20	1	40	10	368
2005	68	8	21	2	42	12	331
2010	65	32	28	10	52	22	253
2012	71	37	26	10	52	25	211

Source: IISS. *Military Balance* 1985-2012.

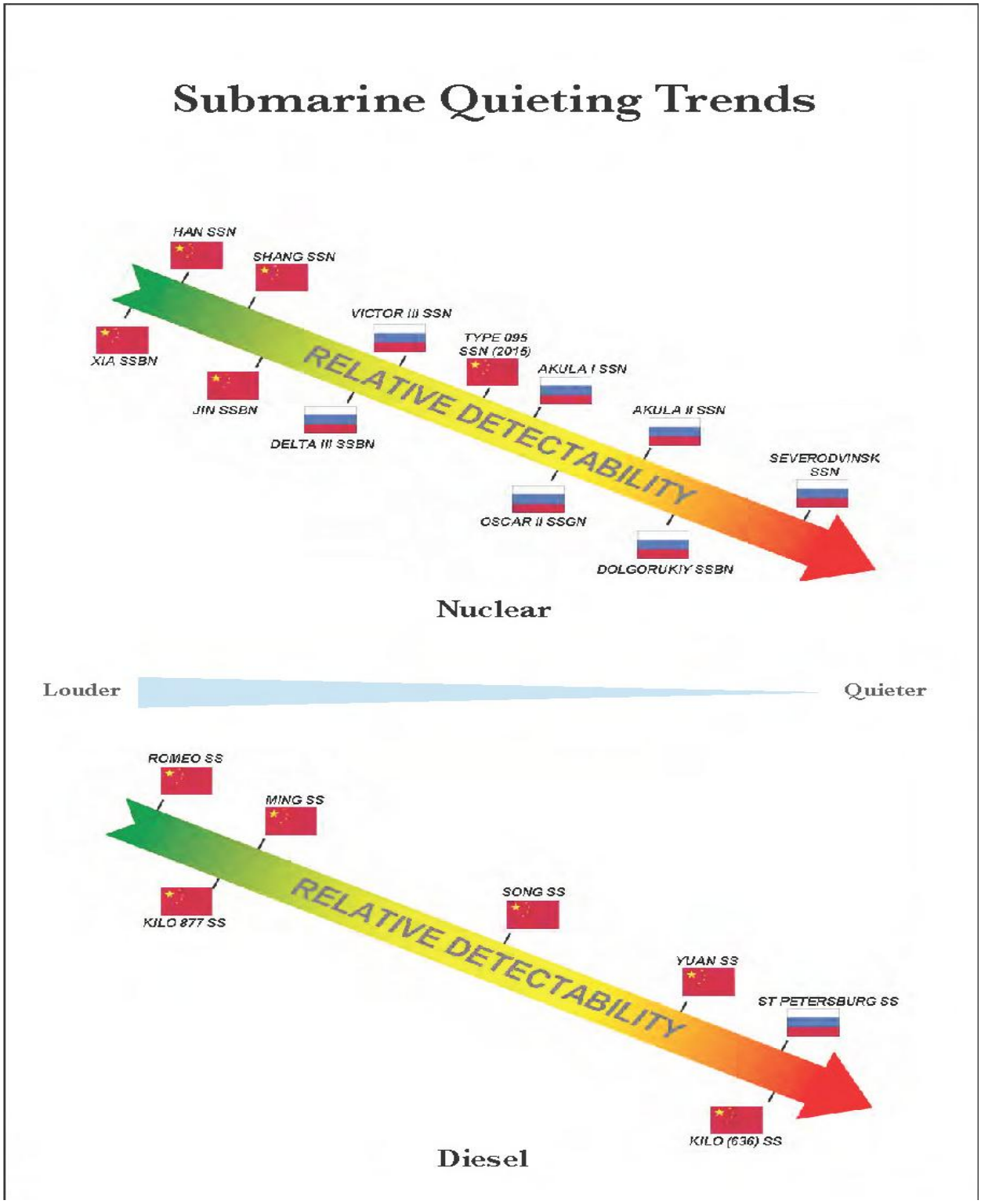
Shift in Equipment Composition

In addition to changes in force structure, the PLAN's modernization program is generating significant changes in the composition of the navy's major weapon systems. Concurrent with relative increases in major combatants, especially surface combatants, the proportion of combatants that can be considered modern is also steadily increasing. Through a combination of domestic production and foreign purchases, the PLAN has created a powerful core of a modern navy in its modern system holdings.

The PLAN's tactical submarine force has undergone significant qualitative improvements since 1985. With the procurement of Russian *Kilo*-class SSK and the production of the *Yuan* class SSK, the PLAN has made significant improvements in submarine quieting. Moreover, the *Yuan, Song,* and *Kilo* class submarines are Anti-Ship Cruise Missile (ASCM) capable.[165] The PLAN has also affected advances in its SSN fleet with the Type-095 SSN, quieter than previous PLAN SSN's and with an ASCM capability, expected by the Office of Naval Intelligence (ONI) to reach initial operational capability by 2015.[166]

The PLAN also has 3 strategic ballistic missile submarines: one *Xia* and two *Jin* class SSBN's. The one first-generation *Xia* class SSBN is not considered operational, but the two more modern *Jin* class SSBN's "give the PLA Navy its first credible second-strike capability."[167] Consequently, the PLAN's submarine modernization efforts are generating results. Figure 6.5 illustrates the advances made in submarine modernization.

Figure 6.5: PLAN Progress in Submarine Technology



Source: ONI. *People's Liberation Army Navy: A Modern Navy with Chinese Characteristics*. 22. http://www.oni.navy.mil/Intelligence_Community/docs/china_army_navy.pdf

Within the surface force, PLAN modernization has resulted in reductions in low-capability single-mission ships and the development of multi-mission major surface combatants. Moreover, these multi-mission capabilities are extending beyond self-defense and certain classes are developing fleet-defense capabilities. For example, "only a decade ago, the longest-range ship-borne surface-to-air missile (SAM) was the *Crotale*-based HHQ-7 (~7nm). Currently, the PLAN operates new ships with four different SAM's with varying"[168] Area-Air Defense (AAD) capabilities. The *Luzhou* guided missile destroyer (DDG), armed with the SA-N-20, is capable of attacking air threats within 80nm of the ship.[169] As a result, PLAN surface ships are now more secure when venturing beyond land-based air cover. A similar trend is occurring with the PLAN's growing AsuW capability. Ships such as the *Sovremeny* I/II DDG's armed with ASCM's and Over-the-Horizon (OTH) radar are capable of targeting opposing surface vessels at ranges of 130nm.[170]

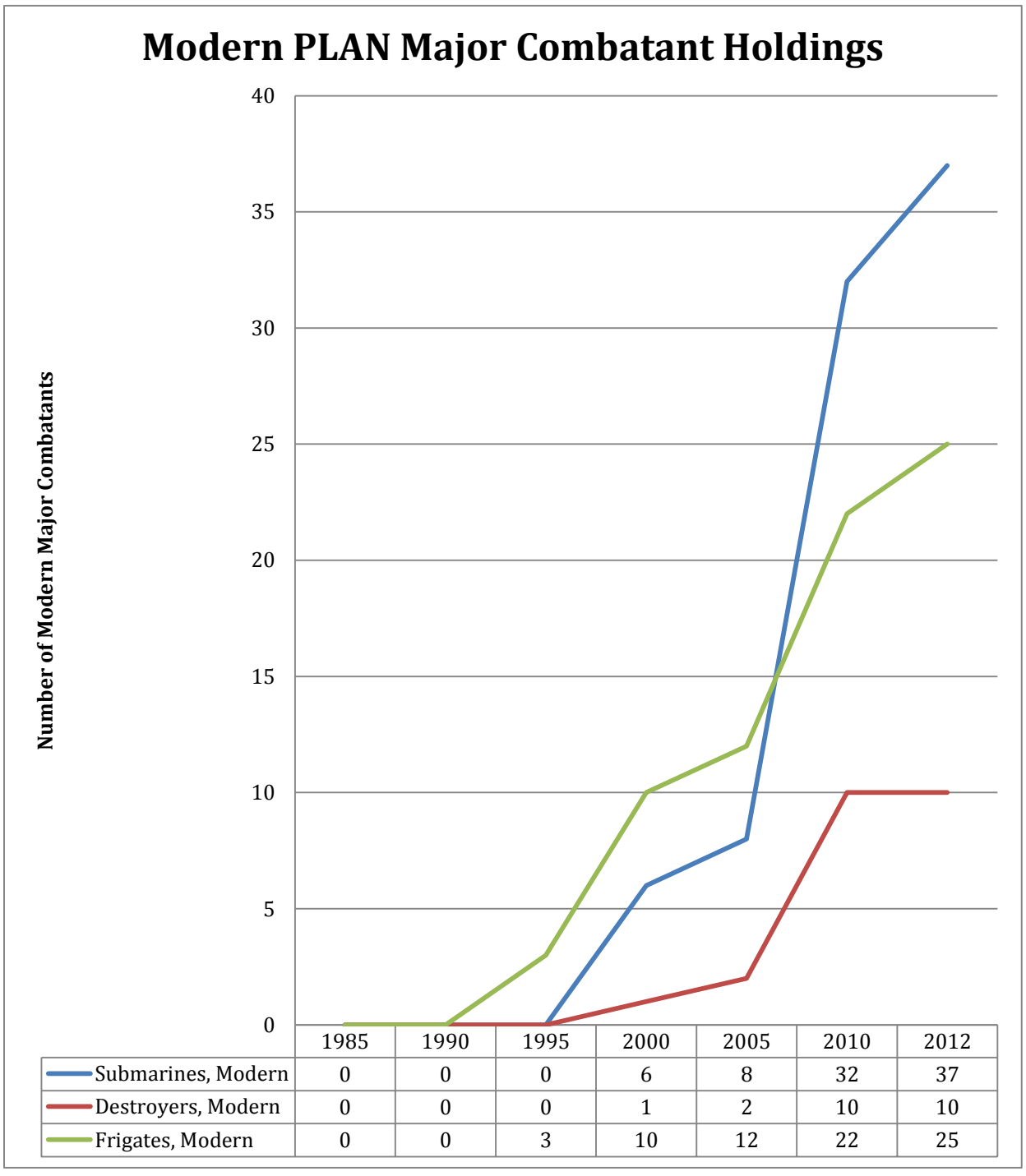
The larger picture of this sustained modernization effort is a PLAN that is simultaneously shifting its force structure to ship types capable of fighting Local Wars while it is simultaneously procuring modern vessels in those categories more capable of fighting Local Wars than the PLAN's older ship classes. Thus, to track the PLAN's modernization efforts, it is necessary to compare both the shifts in force structure and force composition.

Figures 6.6 and 6.7 track the development of the PLAN's force composition. They illustrate the sustained procurement of modern vessels and their growth, absolutely and relatively, in the PLAN arsenal. Moreover, as Figure 6.6 indicates, the PLAN's modern major combatant inventory is larger than most of the region's navies.[171]

It is important to note the parameters for "modern" combatants:

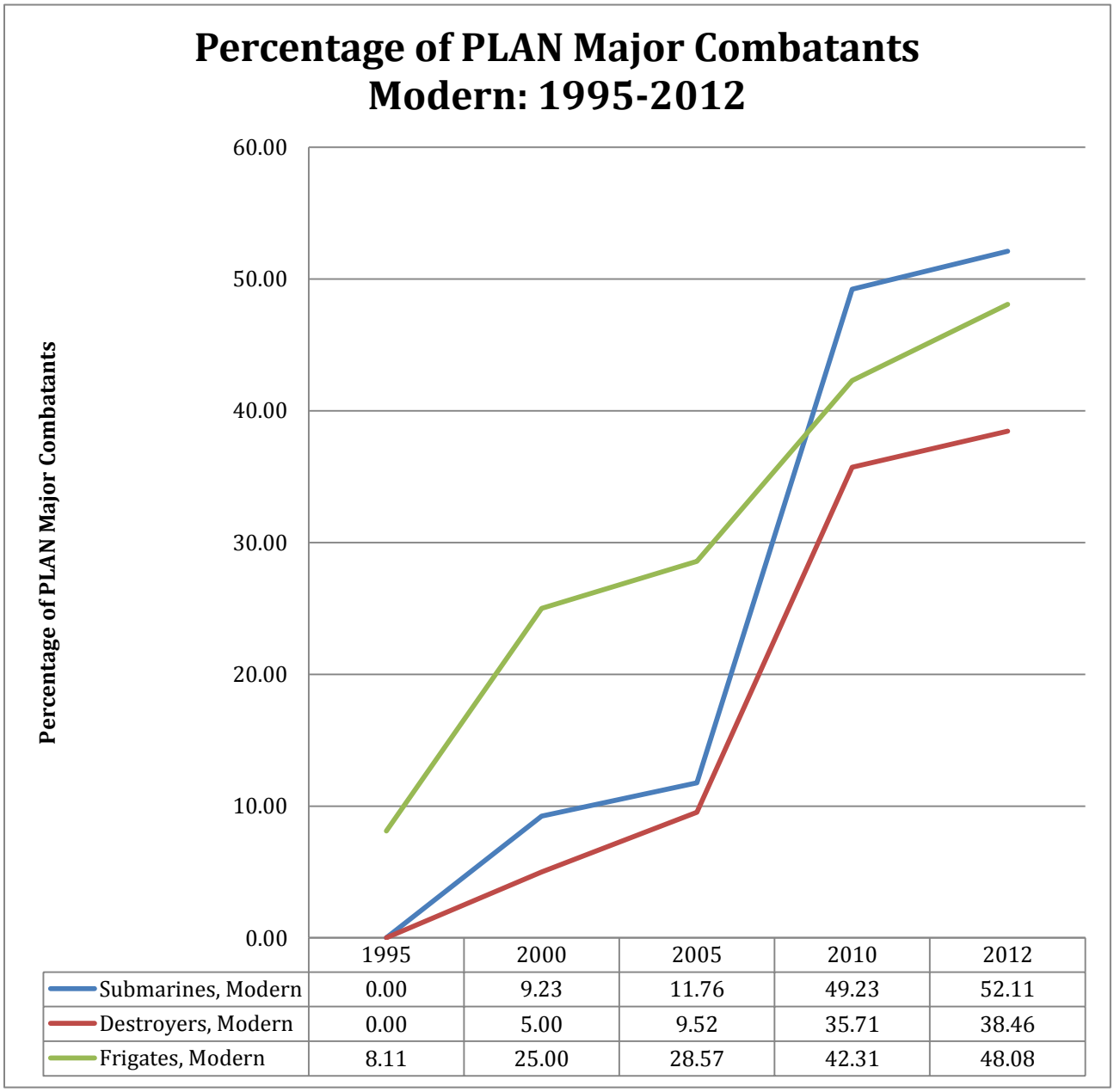
- Submarines: quiet and capable of firing ASCM's
- Major Surface Combatants: Multi-mission capable, containing strong capabilities in at least two warfare areas

Figure 6.6: PLAN Major Combatant Holdings



Source: IISS. *Military Balance* 1985-2012.

Figure 6.7: Relative PLAN Major Combatant Holdings



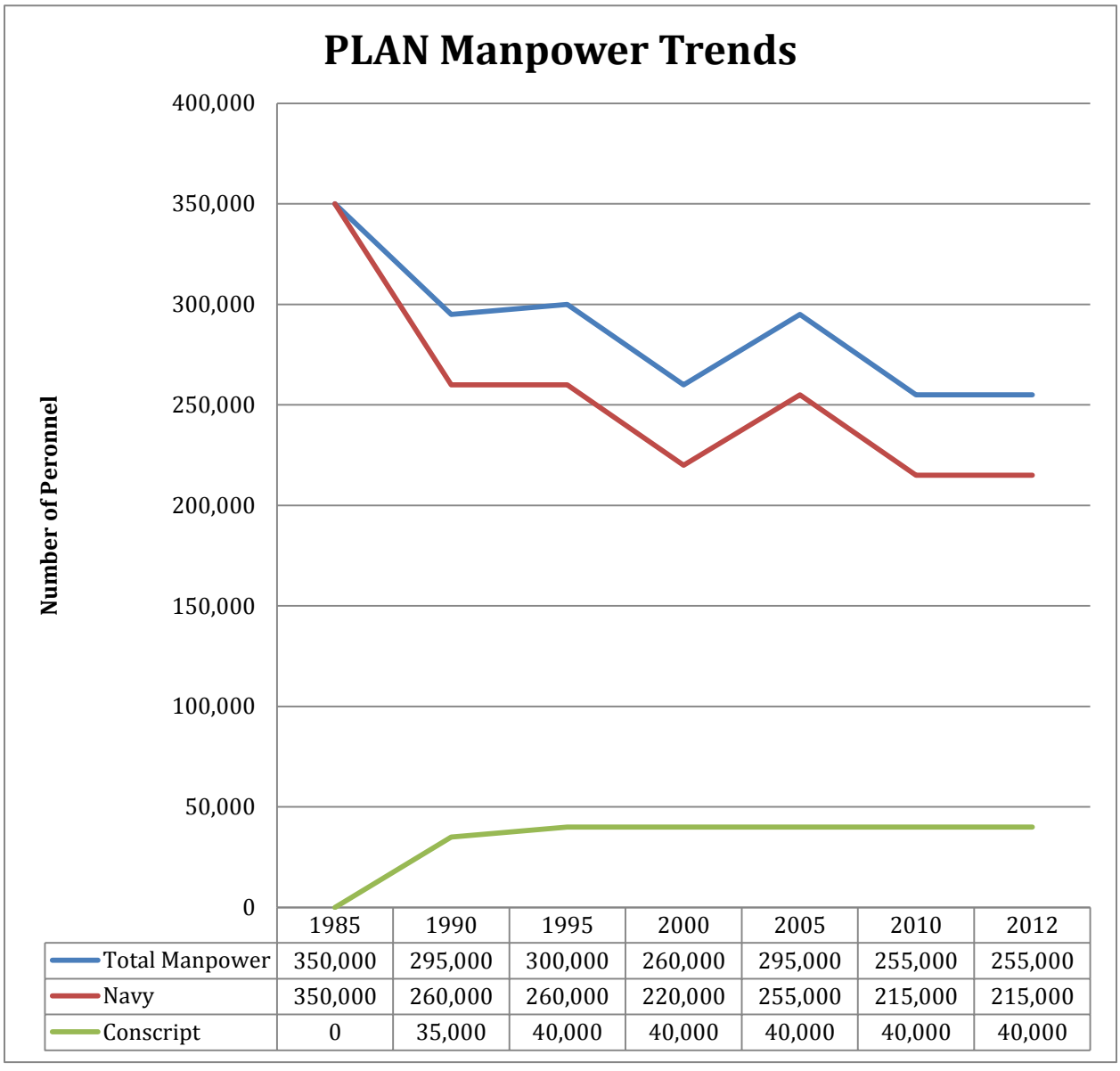
	1995	2000	2005	2010	2012
Submarines, Modern	0.00	9.23	11.76	49.23	52.11
Destroyers, Modern	0.00	5.00	9.52	35.71	38.46
Frigates, Modern	8.11	25.00	28.57	42.31	48.08

Source: IISS. *Military Balance* 1985-2012.

Shift in Manpower

The requirements of fighting Local Wars under Conditions of Informatization and of using modern naval systems generate the need for high human capital within the PLAN. As a result, the PLAN has significantly reduced its manpower since 1985 and has initiated a campaign to develop a professional naval force. In addition, it has augmented investments into its human capital with military exercises and long-distance deployments. Figure 6.8 shows the historical manpower of the PLAN.

Figure 6.8: PLAN Manpower Trends



	1985	1990	1995	2000	2005	2010	2012
Total Manpower	350,000	295,000	300,000	260,000	295,000	255,000	255,000
Navy	350,000	260,000	260,000	220,000	255,000	215,000	215,000
Conscript	0	35,000	40,000	40,000	40,000	40,000	40,000

Source: IISS. *Military Balance* 1985-2012.

The PLAN's effort to develop a professional force rests on three pillars: professional NCO's, academically qualified officers, and improved advancement and educational opportunities for currently serving enlisted personnel. Since 1999, the PLAN has reduced the conscription obligation from four to two years, while doubling the maximum years of service for NCO's from 15 to 30. Furthermore, now NCO's are taking over many of the ship-board jobs previously performed by officers or conscripts.[172] As for officers, their numbers are shrinking as the PLAN aims to attract fewer but more qualified personnel. In order to realize these efforts, the PLAN has expanded reserve officer academic scholarships, increased technical training in the fleet, and targeted higher degree holders for officer positions.[173] Regarding opportunities for currently serving personnel, the PLAN has developed on-the-job, short-term, and on-line training programs.[174]

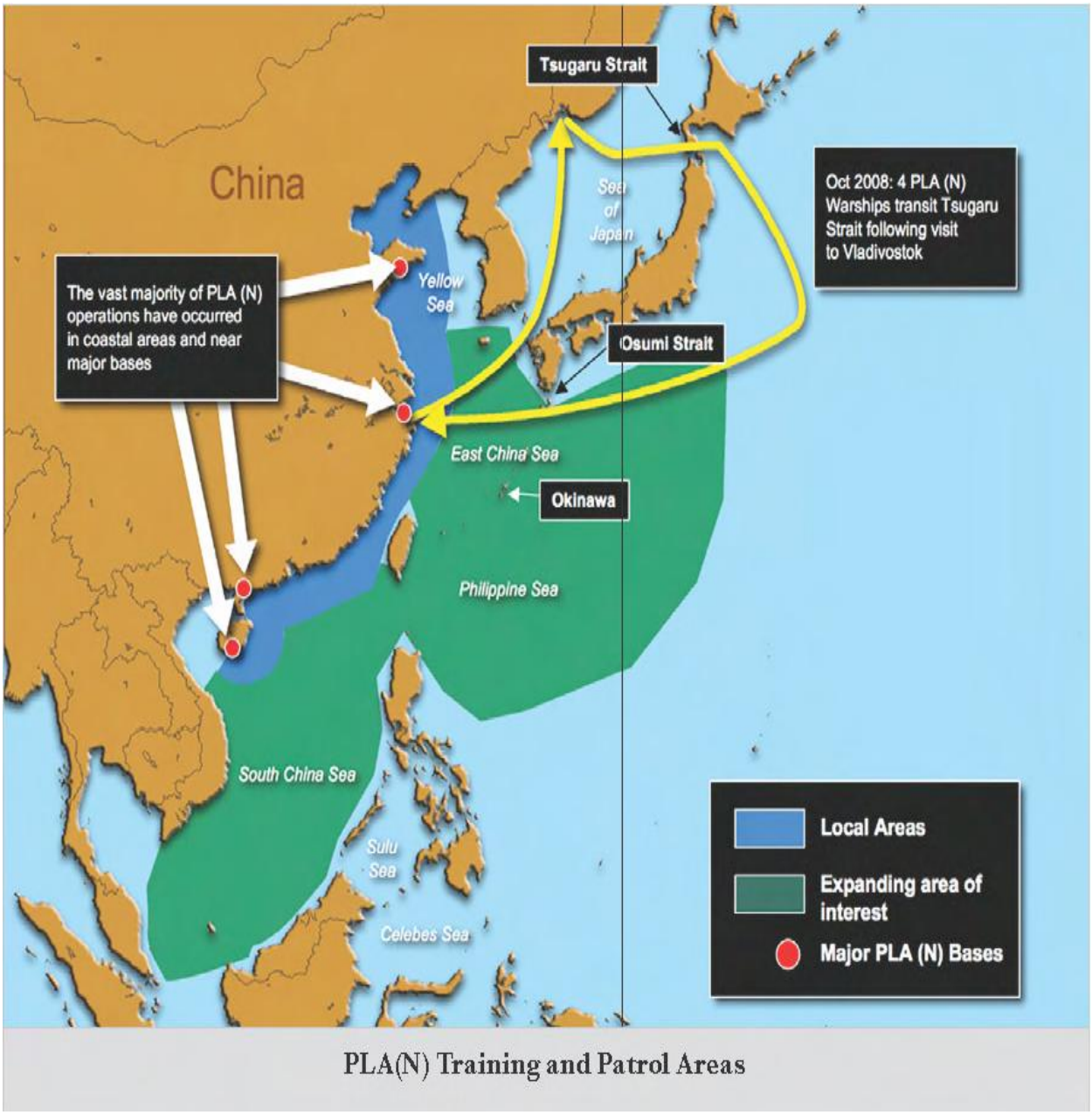
The PLAN has also utilized military exercises and deployments to measure and improve the leadership and combat skills of its personnel. Over the last decade, military exercises have become more realistic and integrated opposition forces. At least once a year, each fleet undertakes a major fleet-level exercise, and occasionally there are multi-fleet exercises.[175]

The PLAN has recently been conducting long-range naval patrols, the longest of which occurs in the Gulf of Aden. Within the Asia-Pacific, there has been a seemingly concerted effort to get PLAN forces to patrol farther from China's coastline. As ONI states:

> "The PLA(N) has conducted surface deployments to the Sea of Japan, South China Sea, Philippine Sea, Eastern Pacific, and, for the first time in China's modern naval history, deployed task groups made up of two combatants and a naval auxiliary to the Gulf of Aden."[176]

Given the PLAN's lack of recent combat experience, these efforts are the only method of developing the combat and leadership skills necessary to fight Local Wars in the manner of Offshore Defense. Consequently, these actions indicate a growing PLAN proficiency in its doctrinal combat capabilities. The geographic expansion of PLAN naval exercises is shown in Figure 6.9.

Figure 6.9: Geographic Expansion in PLAN Military Exercises Locations



Source: ONI, *People's Liberation Army Navy: A Modern Navy with Chinese Characteristics*, 38.

Conclusion

The shift in PLAN force structure, the changing composition of the PLAN's combatant inventory, and the efforts to develop personnel proficient with their equipment and expert at their jobs indicate that the PLAN is modernizing and developing a force suited for the Local Wars and offshore defense concepts. The PLAN's modern combatants provide each of the three PLAN fleets a small core of concentrated combat power, ideally suited to rapidly achieving military objectives within the First Island Chain and capable of producing significant combat power in a limited, local war.

Chapter 7: PLA Air Force

The PLAAF is an air force in transition. A force designed to during much of the Cold War to act as a mass air defense force flying second and third generation aircraft began to shift during the 1990's to a more diversified force structure. Since 2000, the PLAAF has fully embraced a shift from a singular focus on air defense and interceptor fighter aircraft to a multi-mission force, capable of carrying out AD, strike, transport, ISR,[3] and, since 2010, electronic warfare missions. These changes in force structure, as well as the procurement of modern aircraft, have augmented the ability of the PLAAF to conduct both defensive and offensive missions, thereby increasing the PLAAF's utility to the wider PLA in the context of the Local Wars doctrine.

PLAAF Service Strategy

The PLAAF has fundamentally changed its force structure, composition, and manpower policies since 1985. Originally meant as a large air defense force, the PLAAF's force structure was made up primarily of obsolete interceptor aircraft. Its objective was largely to destroy aircraft attacking China and to maintain a small, air-based nuclear deterrent.

The promulgation of the Local Wars concept altered this situation. The CMC had concluded that air power, especially when utilizing precision-guided munitions, would be decisive in future conflicts. Thus, the PLAAF was expected to obtain a long-range precision strike capability.[177] However, given the PLAAF's large inventory of second and third generation interceptor aircraft which lacked Beyond-Visual-Range (BVR) capability, advanced radar, and specialized electronic warfare (EW) support aircraft, the PLAAF would have to fundamentally change in order to successfully fight and win Local Wars. In particular, it would have to restructure itself to comprise more heavily of strike, rather than interceptor, aircraft. Furthermore, it would have to procure more advanced aircraft which were capable of carrying out these missions despite adversary defenses. Most importantly, the PLAAF would have to develop the human capital needed to utilize advanced systems and operate according to the Local Wars doctrine.

In response to this challenge, the PLAAF released its own service strategy in 2004, "Integrated Air and Space Operations, Being Prepared for Simultaneous Offensive and Defensive Operations."[178] A response to the Local Wars doctrine, it states that the PLAAF is to be a force capable of defending China's air space and of strike operations against China's adversaries. Moreover, the PLAAF is expected to augment the operational reach of the PLA and function as a "strategic service" capable of obtaining China's political objectives in concert with the rest of the PLA or separately.[179]

Shift in Force Structure, Equipment Composition, and Manpower

The PLAAF has altered its force structure in response to the necessities of the Local Wars concept and its own service strategy by both proliferating aircraft types and dramatically reducing the proportion of aircraft allocated to the interception role. Currently, the PLAAF has large inventories of fighter, ground attack, and transport aircraft, as well as the beginnings of ISR,

[3] Intelligence, Surveillance, and Reconnaissance (ISR)

command and control (C2), Airborne Early Warning and Control (AEW&C), EW, and Electronic Intelligence (ELINT) aircraft.

The PLAAF has also changed its force composition. It is currently in the midst of replacing obsolete, single-purpose aircraft with multi-role modern aircraft. At this time, the PLAAF is roughly 1/3 modern. This development is a significant improvement from the 1990's, when the PLAAF was dependent on a handful of Russian 4th generation fighters to provide modern aircraft capabilities.

Manpower policies are also furthering the development of a force capable of fighting Local Wars. PLAAF manpower has decline significantly since 1985, while policies are in place to improve the combat capability of the PLAAF's personnel. A combination of improved academic performance in recruits, more intensive training, and joint military exercises are developing the skills needed for Local Wars.

Shift in Force Structure

The shift in force structure has been decisive and has significant implications for the PLAAF's ability to conduct the missions required by the Local Wars concept: precision strike, air defense, ISR, EW, and strategic airlift. As the data in Figure 7.1 shows, the PLAAF has altered its force structure by proliferating the categories of aircraft in its inventory. Some aspects important to note are the significant drop in fighter aircraft numbers over the period, the absolute and relative increase in ground attack aircraft, the steady decline of bomber numbers, and the development of different aircraft categories.

Figure 7.1: Force Structure of the PLA Air Force, 1985-2012

	1985	1990	1995	2000	2005	**2010**	**2012**
Personnel	490,000	470,000	470,000	420,000	400,000	330,000	330,000
Air Force	490,000	470,000	470,000	420,000	400,000	330,000	330,000
Reserve	?	?	?	?	?	?	?
Total combat aircraft	5,300	5,000	4,970	3,000	1,900+	**1,617**	**1693**
Bombers	620	395+	470	120	180	82	82
H-5/F-5/F-5B	500	275+	350	0	40	0	0
H-6 (Tu-16)	120	120	120	0	0	0	0
H-6A/E/H/K/M	0	0	0	120	140	82	82
Possibly with YJ-63 missiles	0	0	0	0	20	some	some
Fighters	4,000	4,000	4,000	1,015	936	1,100+	890
J-5	400	400	400	0	0	0	0

J-6B/D/E	3,000	3,000	3,000	0	0	0	0
J-7	200	300	500	0	0	48	240
J-7II/B	0	0	0	400	400	192	0
J-7IIH/J-7H	0	0	0	?	50	48	0
J-7IIM	0	0	0	?	24	0	0
J-7III	0	0	0	100	0	0	0
J-7C	0	0	0	0	50	48	0
J-7D	0	0	0	0	0	24	0
J-7E	0	0	0	200	150	144	192
J-7G	0	0	0	0	0	48	120
J-8 (J-8D/J-8F)	30	200	100	100	20	24	0
J-8IIA	0	0	0	0	40	60	0
J-8IIB	0	0	0	150	50	108	24
J-8IID	0	0	0	0	24	36	0
J-8IIE	0	0	0	0	50	12	0
J-8F	0	0	0	0	0	24	48
J-8H	0	0	0	0	0	48	96
J-10	0	0	0	0	0	120+	0
Su-27SK	0	0	24	65	78	some	43
Su-27UBK	0	0	0	0	0	0	32
J-11	0	0	0	0	0	116	95
FGA	500	500	500	1,800	626	283	415+
J-4	some	0	0	0	0	0	0
J-6	0	0	0	0	300	0	0
J-6A	0	0	0	0	50	0	0
J-6B/D/E	0	0	0	1,500	0	0	0
JH-7/HJ-7A	0	0	0	0	0	72	72
Q-5	some	500	500	0	0	0	0

Q-5C/D/E	0	0	0	300	300	120	0
MiG-19	0	0	0	0	0	0	0
J-10A/S	0	0	0	0	0	0	200+
J-11B/BS	0	0	0	0	0	18+	70+
Su-30MKK	0	0	0	40 (delivered)	76	73	73
ISR	130	290	290	290	290	120	99
HZ-5	some	40	40	40	40	0	0
JZ-5	0	150	150	0	0	0	0
JZ-6 (MiG-19R)	some	100	100	100	100	72	48
JZ-7 (MiG-21)	0	0	0	some	some	0	0
JZ-8 Finback	0	0	0	0	20	24	24
JZ-8F Finback	0	0	0	0	0	24	24
Y-8H1	0	0	0	0	0	3	3
Tu-154M	0	0	0	2	4	0	0
Tanker	0	0	0	6	10	10	10
HY-6	0	0	0	6	10	0	0
H-6U	0	0	0	0	0	10	10
Transport	550	420	600	425	513	296	320+
Bae Trident 1E/2E	18	18	18	0	0	0	0
An-12	some	25	25 (some tkr)	68	49	0	0
B-737-200	0	0	0	6	8	15	9
CL 601 Challenger	0	0	0	2	5	5	0
CRJ-200	0	0	0	0	0	0	5
CRJ-700	0	0	0	0	0	0	5
Il-14	some	30	30	0	0	0	0
Il-18	some	10	10	2	2	2	0
Il-76 Candid	0	0	10	14	20	18	10
Li-2	some	50	50	0	0	0	0

Tu-154	0	0	0	15	15	17	12
Y-11	0	Some	15	15	15	20	20
Y-12	0	some	2	8	8	8	8
Y-5 Colt	300	300	300	300	300	170	170
Y-7/Y-7H (An-26)	10	20	25	45	93	41	41
Y-8	0	0	0	0	0	some	40+
EW	0	0	0	0	0	10	13
Y-8CB	0	0	0	0	0	0	4
Y-8G	0	0	0	0	0	0	7
Y-8XZ	0	0	0	0	0	0	2
Y-8D	0	0	0	0	0	10	0
ELINT	0	0	0	0	0	0	4
Tu-154M/D	0	0	0	0	0	0	4
AEW&C	0	0	0	0	0	8	8+
KJ-200	0	0	0	0	0	4	4+
KJ-2000	0	0	0	0	0	4	4
C2	0	0	0	0	0	0	**5**
B-737-200	0	0	0	0	0	0	2
Y-8T	0	0	0	0	0	0	3
Training	some	some	Some	200	200	522	490
CJ-5	some	some	Some	0	0	0	0
CJ-6	some	some	Some	0	0	400	400
HJ-5	some	some	Some	some	some	0	0
J-2	0	some	Some	0	0	0	0
JJ-2	0	some	Some	0	0	0	0
JJ-4	Some	some	Some	0	0	0	0
JJ-5	Some	some	Some	0	0	0	0
JJ-6 (MiG-19UTI)	Some	some	Some	some	0	0	0

JJ-7 MongolA	0	0	0	some	50+	50	50
JL-8 (K-8)	0	0	0	some	8+	40	40
PT-6 (CJ-6)	0	0	0	some	0	0	0
Su-27UBK	0	0	0	0	0	32	0
Helicopters	400	400	400	170	90-100	**80+**	**104**
Multi-role	Some	36	36	36	46	20	22+
Z-9 (AS-365N Dauphin 2)	Some	10	50	30	20	20	20
Mi-17-V5	0	0	0	0	0	0	2
Transport	Some	338+	465+	134	24	60	82+
S-70C-2	0	24	20	0	0	0	0
Z-5	Some	300	250	100	0	0	0
Z-6	Some	some	100	0	0	0	0
Z-8/SA321	Some	0	15	0	0	some	18+
AS-332 Super Puma	0	6	6	6	6	6	6+
Mi-8	0	30	30	30	50	50	50
Mi-17	0	0	28	0	0	0	0
Mi-171	0	0	0	0	0	some	4+
Bell 214	0	4	4	4	4	4	4
UAVs	0	0	0	some	some	some	some
CH-1 *Chang Hong*	0	0	0	some	some	some	some
Chang Kong 1	0	0	0	0	0	some	some
BQM-32	0	0	0	0	0	some	some
Harpy	0	0	0	0	0	some	some
Air defense	0	some	Some	some	some	some	some
SAMs	0	0	0	100+	100+	600+	600+
Towed	0	some	Some	500+	500+	300+	300+
HQ-2 (SA-2)	0	some	Some	500+	500+	300+	300+
HQ-61	0	some	Some	0	0	0	0
SP	0	0	0	240+	228+	300+	300+

HQ-7	0	0	0	100+	60+	60+	60+
HQ-9	0	0	0	0	24	32	32
HD-6D	0	0	0	0	0	24	24
HQ-12	0	0	0	0	0	24	24
HQ-16	0	0	0	0	0	0	some
S-300PMU (SA-10)	0	0	Some	120	0	32	32
S-300PMU1 (SA-20)	0	0	0	0	some	64	64
S-300PMU2 (SA-20)	0	0	0	0	some	64	64
HQ-15 FT-2000	0	0	0	20+	0	0	0
Guns	16,000	16,000	16,000	16,000	16,000	16,000	16,000
35mm	0	some	Some	0	0	0	0
57mm	Some	some	Some	0	0	0	0
85mm	Some	some	Some	some	some	some	some
100mm	Some	some	Some	some	some	some	some
Missiles	Some	some	Some	?	4,500+	4,500+	some
ASMs	0	some	Some	some	some	some	some
HY-2	0	0	0	Some	0	0	0
HY-4	0	0	0	some	0	0	0
C-601	0	some	Some	0	0	0	0
C-801	0	some	Some	0	0	0	0
AS-14 Kedge	0	0	0	0	some	some	some
AS-17 Krypton	0	0	0	0	some	some	some
AS-18 Kazoo	0	0	0	0	some	some	some
YJ-61	0	0	0	some	0	0	0
YJ-63	0	0	0	0	some expected	some	some
YJ-81K	0	0	0	some	0	0	0
KD/YJ-88	0	0	0	0	0	some	some
YJ-91 (X-31 II)	0	0	0	0	0	some	some

CJ-10	0	0	0	0	0	0	some
AAM	0	0	0	600+	4,500+	some	some
AA-12 Adder	Some	some	Some	100 on order for Su-30	100	some	some
P-27 (AA-10 Alamo)	0	0	0	250+	1,200	some	some
P-37 (AA-11 Archer)	0	0	0	250+	3,200	some	some
PL-2	0	0	0	0	0	0	
PL-2B	Some	some	Some	some	some	some	some
PL-5B	0	0	0	some	some	some	some
PL-7	0	some	Some	?	?	0	0
PL-8	0	some	Some	some	some	some	some
PL-9	0	0	Some	some	0	0	0
PL-11	0	0	0	0	0	0	some
PL-12	0	0	0	0	some	some	some

Source: IISS. *Military Balance* 1985-2012.

Figures 7.2-7.4 better illustrate the trends in the data above. Figure 7.2 provides a visualization of the force structure trends presented in Figure 7.1. Figure 7.3 aggregates these numbers to show both a historical comparison of overall combat aircraft numbers and also the relative size of the PLAAF dedicated to each mission category. Figure 7.4 illustrates change over time for each individual aircraft category, and charts the changes in the relative portion of each category in the PLAAF.

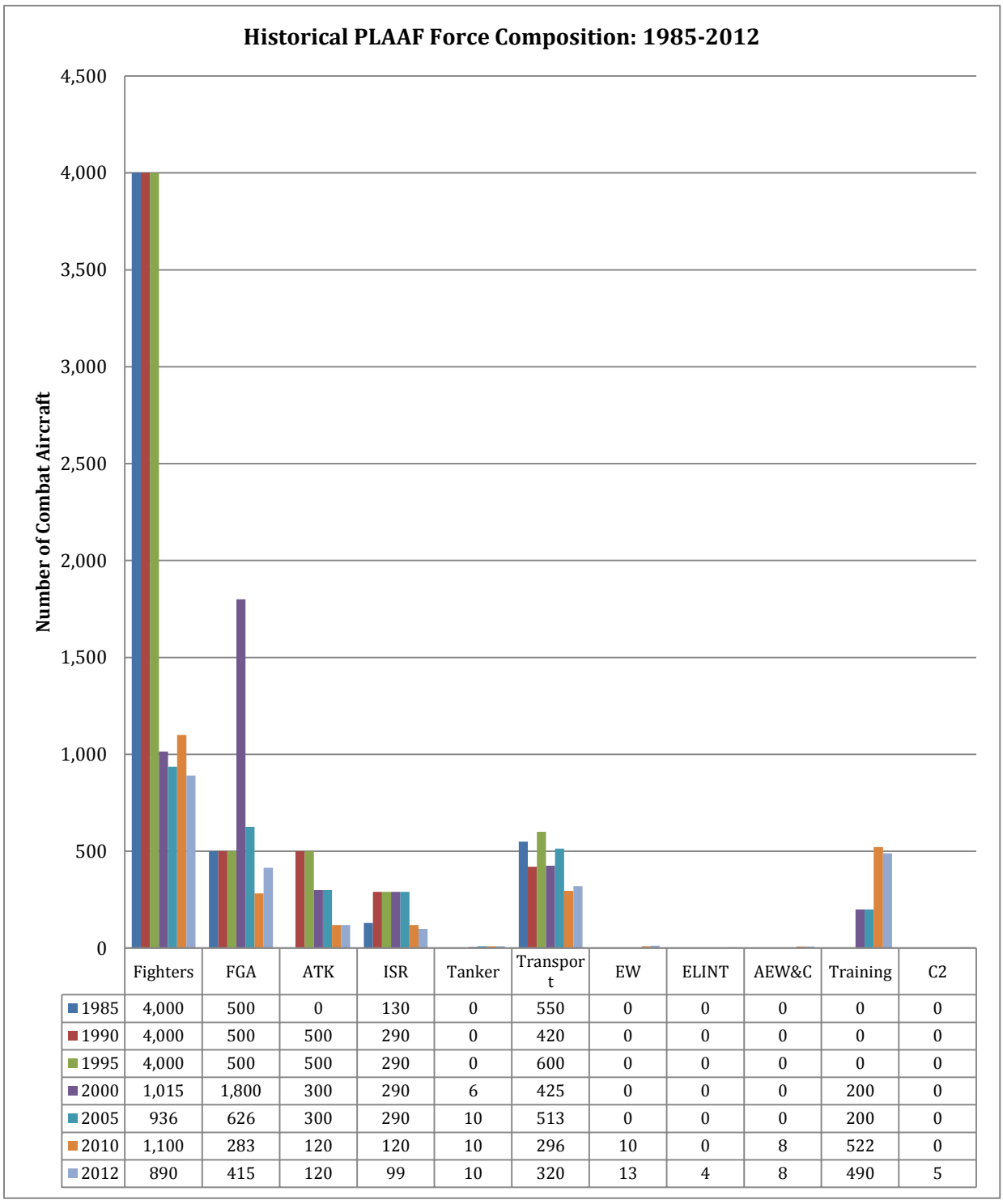
There are a number of indicators that are best observed visually. The first is the magnitude and speed of the decline in fighter-interceptor aircraft, both absolutely and relatively. Between 1995 and 2012, roughly 3,000 fighter-interceptors were removed from the PLAAF's inventory: fighter –interceptor aircraft dropped from ~80% of the PLAAF to ~50%. Fighter-ground attack aircraft faced a different trend: overall numbers did not markedly increase but their relative share of the PLAAF's inventory increased by more than 2.5 times. Training and transport aircraft both increased in absolute numbers significantly, but their impact is best shown by their relative share of the PLAAF's aircraft holding. As the figures below show, the dominance of the fighter-interceptor in the PLAAF has been eroded and other categories of aircraft are making larger and larger portions of the PLAAF. This trend indicates a significant change in doctrine and military objectives: more specifically, the changing force structure indicates greater doctrinal emphasis on ground attack, transport, and training missions. All of these are in lines with the Local Wars concept.

In addition to the previously described changes in the numbers of fighter-interceptor, fighter-ground attack, transport, and training aircraft, changes in the other categories also have significance.

The decline and the steady plateau of PLAAF bombers, combined with small numbers of tanker aircraft, indicate that the PLAAF is limiting the majority of its strike missions to targets within the first island chain. The H-6 variants forming the entirety of the PLAAF's bomber force appear to be cruise-missile buses suitable for use against distant targets.[180] However, given their relatively small number relative to the fighter-ground attack aircraft, even accounting for the large number of cruise missiles they could potentially carry, it appears that the PLAAF has either decided to concentrate its scarce resources within the First Island Chain, has not identified many targets worth striking outside of the First Island Chain, or potentially has abdicated medium range strike to the Second Artillery Corps.

Some American experts argue that the small number of tankers, EW, ELINT, AEW&C, and C2 aircraft indicates two things: first, that the PLAAF still does not function as effectively as the Western or Russian air forces, but also that the PLAAF has begun to plant the seeds of its own modernization and force development, and plans to develop similar capabilities as the Western and Russian air forces.

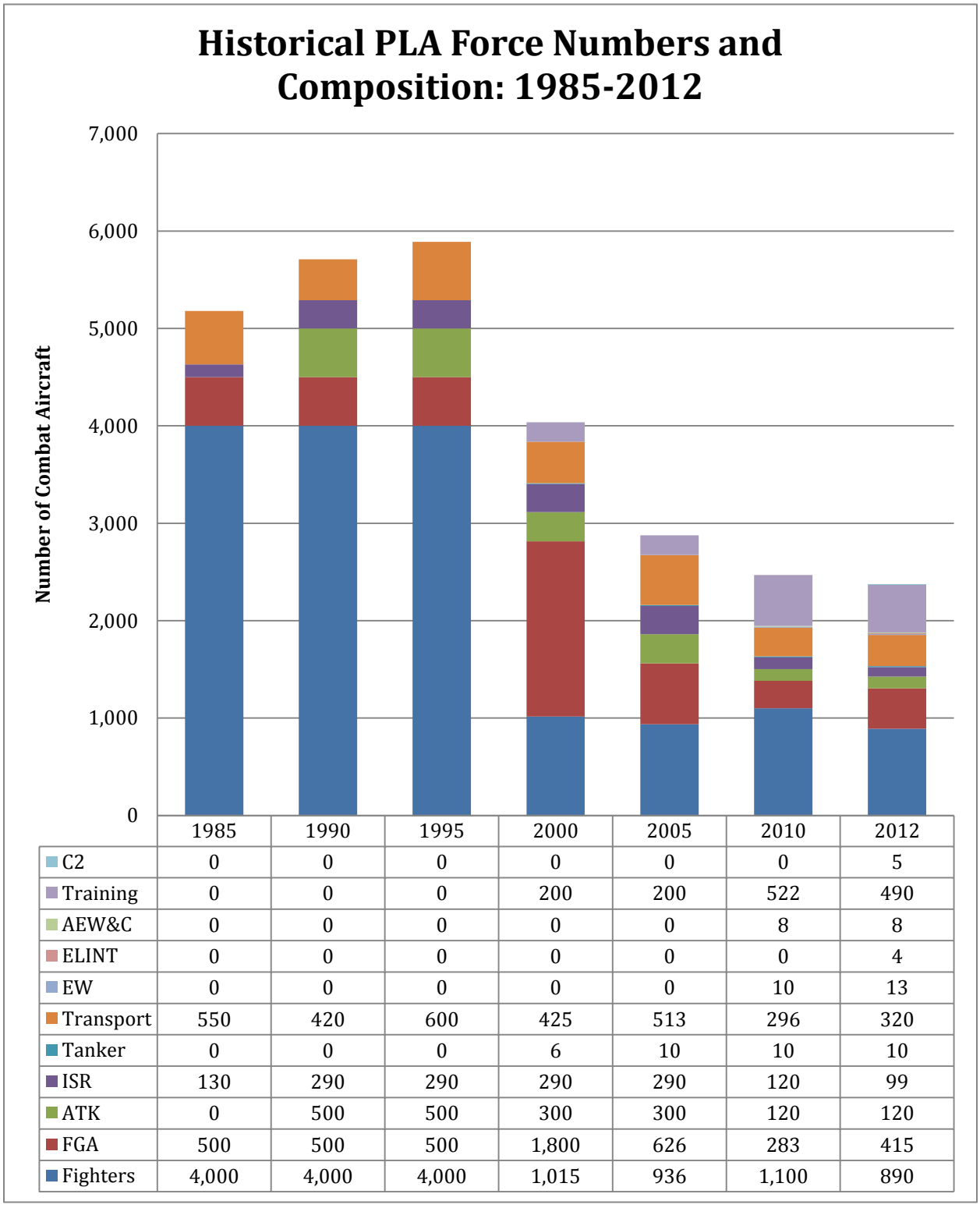
Figure 7.2: Historical PLAAF Force Structure



	Fighters	FGA	ATK	ISR	Tanker	Transport	EW	ELINT	AEW&C	Training	C2
1985	4,000	500	0	130	0	550	0	0	0	0	0
1990	4,000	500	500	290	0	420	0	0	0	0	0
1995	4,000	500	500	290	0	600	0	0	0	0	0
2000	1,015	1,800	300	290	6	425	0	0	0	200	0
2005	936	626	300	290	10	513	0	0	0	200	0
2010	1,100	283	120	120	10	296	10	0	8	522	0
2012	890	415	120	99	10	320	13	4	8	490	5

Source: IISS. *Military Balance* 1985-2012.

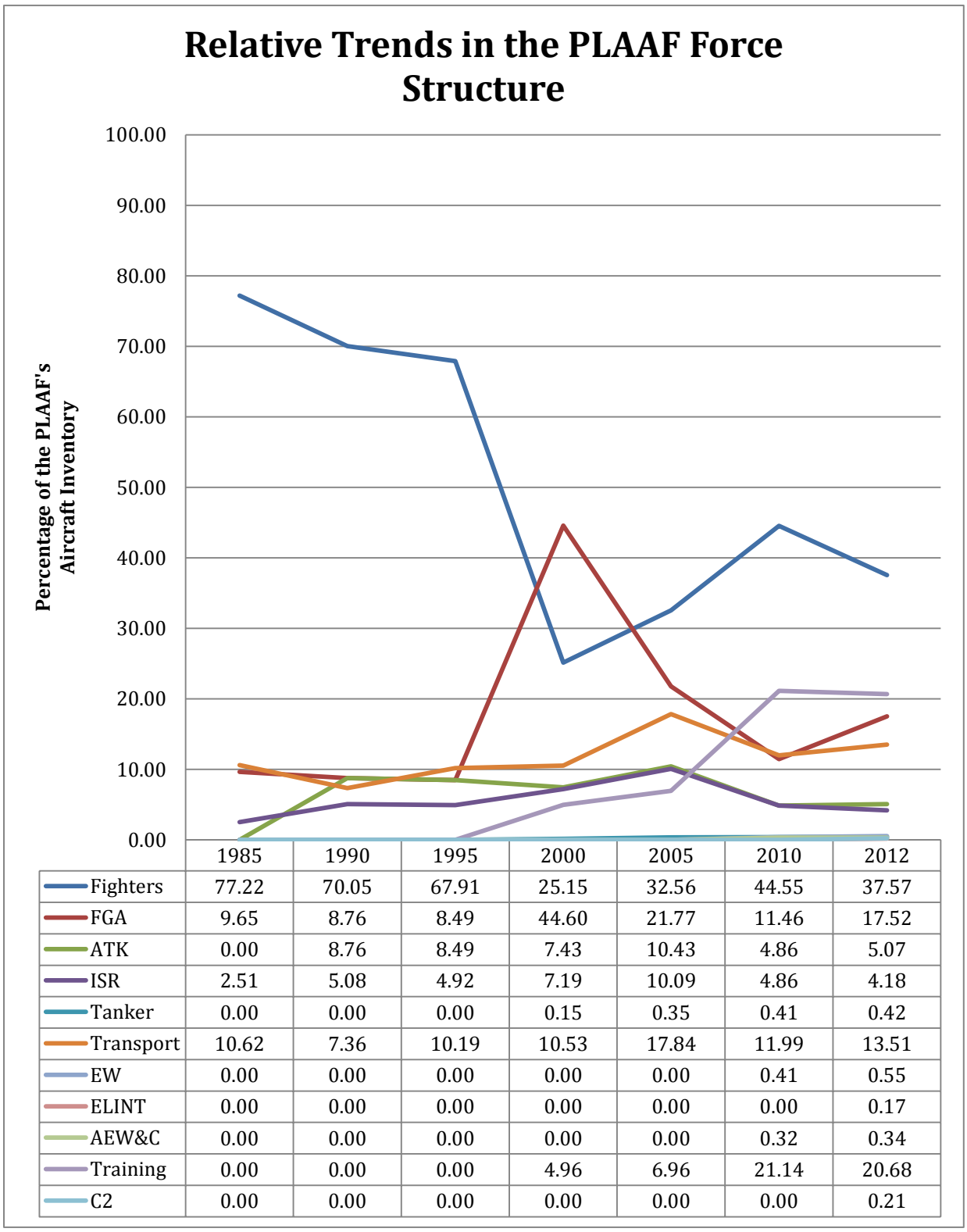
Figure 7.3: A Comparison of Historical Aircraft Type Holdings



	1985	1990	1995	2000	2005	2010	2012
C2	0	0	0	0	0	0	5
Training	0	0	0	200	200	522	490
AEW&C	0	0	0	0	0	8	8
ELINT	0	0	0	0	0	0	4
EW	0	0	0	0	0	10	13
Transport	550	420	600	425	513	296	320
Tanker	0	0	0	6	10	10	10
ISR	130	290	290	290	290	120	99
ATK	0	500	500	300	300	120	120
FGA	500	500	500	1,800	626	283	415
Fighters	4,000	4,000	4,000	1,015	936	1,100	890

Source: IISS. *Military Balance* 1985-2012.

Figure 7.4: Historical Relative Trends in the PLAAF's PLAAF Force Structure



	1985	1990	1995	2000	2005	2010	2012
Fighters	77.22	70.05	67.91	25.15	32.56	44.55	37.57
FGA	9.65	8.76	8.49	44.60	21.77	11.46	17.52
ATK	0.00	8.76	8.49	7.43	10.43	4.86	5.07
ISR	2.51	5.08	4.92	7.19	10.09	4.86	4.18
Tanker	0.00	0.00	0.00	0.15	0.35	0.41	0.42
Transport	10.62	7.36	10.19	10.53	17.84	11.99	13.51
EW	0.00	0.00	0.00	0.00	0.00	0.41	0.55
ELINT	0.00	0.00	0.00	0.00	0.00	0.00	0.17
AEW&C	0.00	0.00	0.00	0.00	0.00	0.32	0.34
Training	0.00	0.00	0.00	4.96	6.96	21.14	20.68
C2	0.00	0.00	0.00	0.00	0.00	0.00	0.21

Source: IISS. *Military Balance* 1985-2012.

Shift in Equipment Composition

While the changing force structure of the PLAAF has significant consequences for its combat capabilities, the rapid modernization of the PLAAF's aircraft inventory has also augmented PLAAF combat power: relative to as late as 2000, the PLAAF is now a decisively more modern force and its combat power has improved as a consequence.

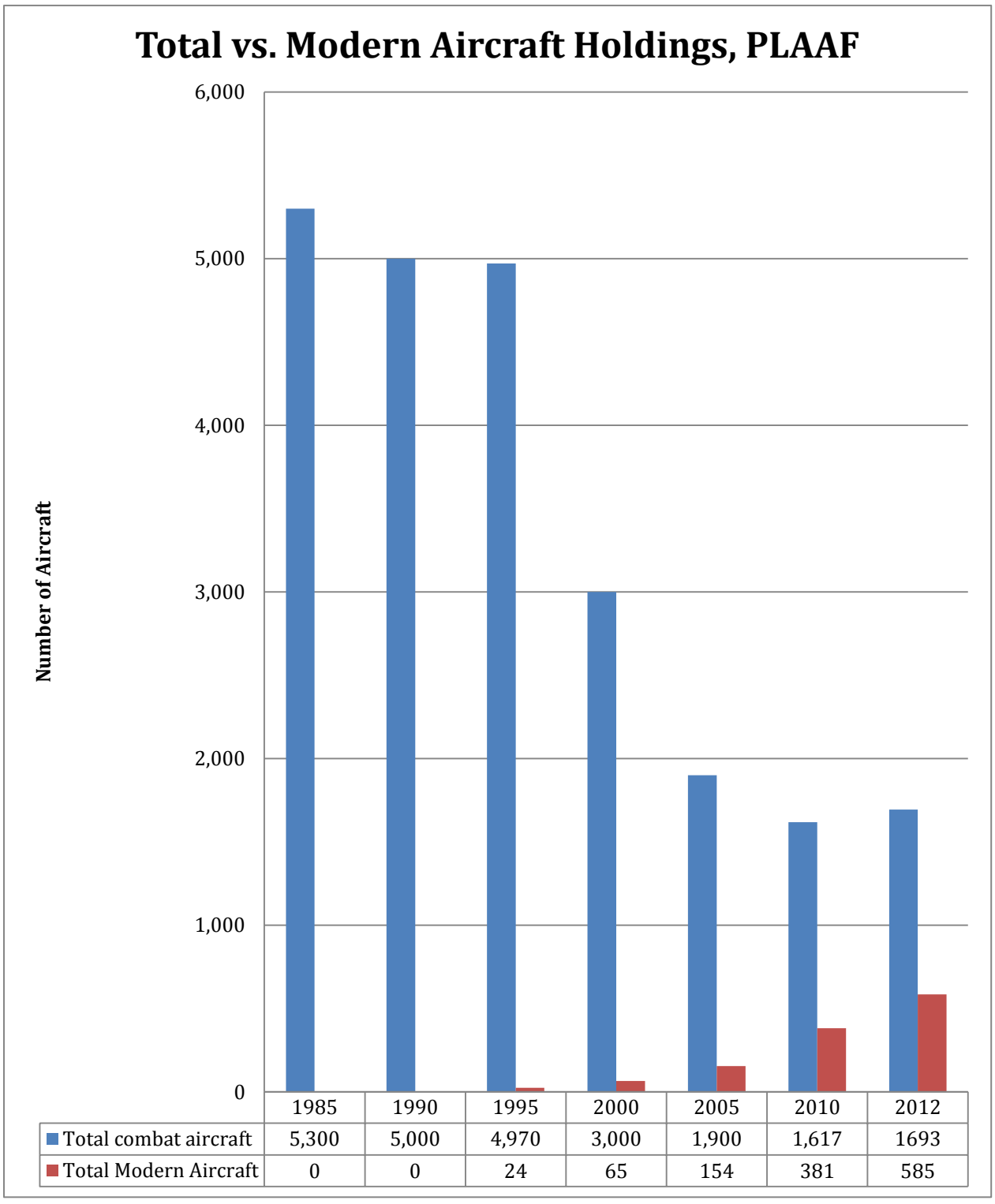
Tied to the Local Wars doctrine, the PLAAF requires the capability to conduct precision strikes, air defense, ISR, EW, and strategic airlift. The nimble, powerful military force envisioned by the Local Wars doctrine requires an air force that can support the other services along the entire periphery of China despite the exploitation, by adversaries, of weaponized information technology.

China's second and third generation fighter, strike, and bomber aircraft are unlikely to survive the high-attrition military conflicts predicted by the Local Wars theory given their lack of advanced radar, BVR-combat capabilities, and reduced radar profiles. The PLAAF has responded to this reality by significantly reducing its holding of second and third generation aircraft while developing and purchasing fourth generation or near-fourth generation aircraft. Indigenously developed J-10, J-11, and JH-7 fighter and strike aircraft, as well as the continued development of the J-20 fifth generation aircraft, improve the survivability and effectiveness of China's air force. Likewise, the purchase of Su-27 and Su-30 aircraft quickly provided the PLAAF with a fourth generation fighter capability. The production and purchase of these aircraft has and will improve the capability of the PLAAF to an extent greater than can be predicted solely by analyzing force structure or aircraft numbers. Consequently, it is necessary to examine both force structure and force composition in order to measure the PLAAF's progress towards becoming an air force capable of winning Local Wars.

It is important to note that all aircraft with fourth generation or near-fourth generation capabilities are considered modern. In the PLAAF arsenal, this includes J-10, J-11, Su-27, Su-30, and JH-7 aircraft. As they are developed, J-15 and J-20 aircraft will be added to this list.

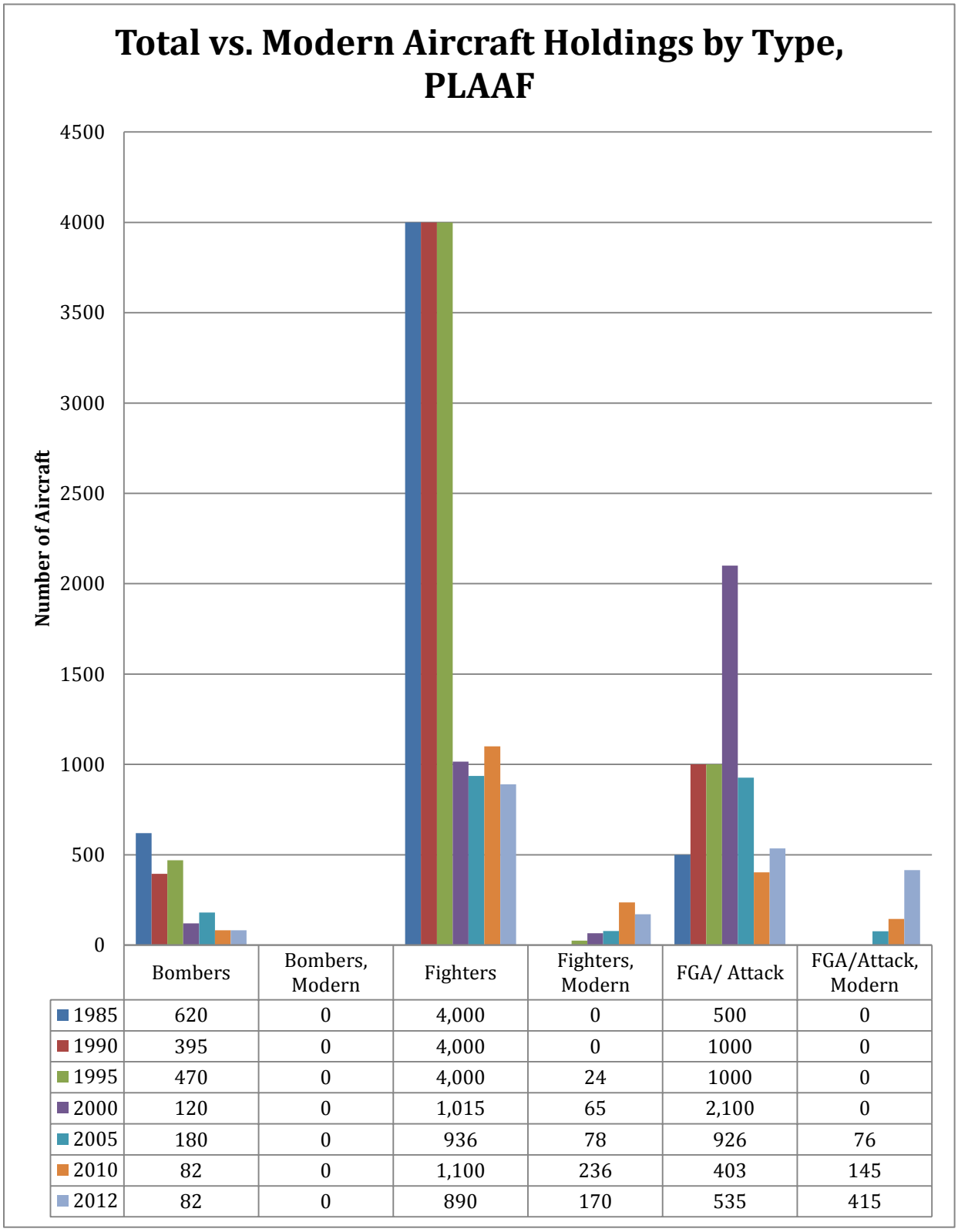
Figures 7.5 and 7.6 show the numbers of modern PLAAF aircraft in comparison to overall PLAAF holdings. They indicate both the absolute progress the PLAAF is making in its drive to acquire modern aircraft and also its relative progress in becoming a modern air force. In the year 2012, with over 500 modern fighters or fighter bombers, the modern portion of the PLAAF outnumbers most air forces in the Asia-Pacific region. In addition, the import of Su-27 and Su-30 aircraft, along with the manufacture of indigenous fourth generation fighter aircraft such as the J-10 and J-11, suggest that the PLAAF will continue developing itself into a modern air force which fields a higher proportion of fourth generation systems. Moreover, the J-20 stealth fighter prototype indicates that the PLAAF is seeking a fifth generation combat capability.

Figure 7.5: Total Versus Modern Aircraft in the PLAAF



Source: IISS. *Military Balance* 1985-2012.

Figure 7.6: Total Versus Modern Aircraft by Type



	Bombers	Bombers, Modern	Fighters	Fighters, Modern	FGA/ Attack	FGA/Attack, Modern
1985	620	0	4,000	0	500	0
1990	395	0	4,000	0	1000	0
1995	470	0	4,000	24	1000	0
2000	120	0	1,015	65	2,100	0
2005	180	0	936	78	926	76
2010	82	0	1,100	236	403	145
2012	82	0	890	170	535	415

Source: IISS. *Military Balance* 1985-2012.

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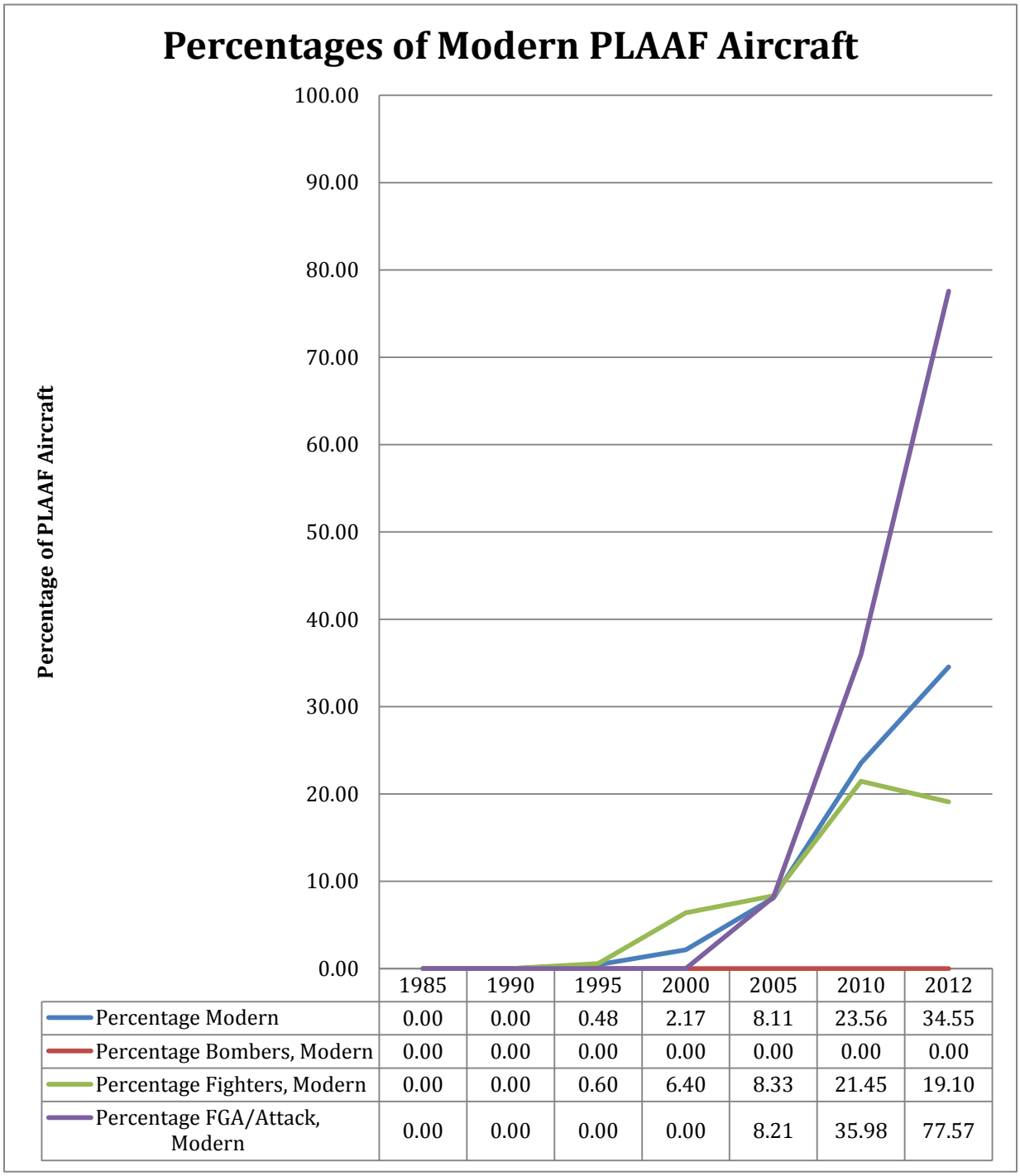
Placing these modernization trends into better perspective, and further enabling the observer to see concurrent changes in force composition and capability, Figure 7.6 tracks the percentage of the PLAAF that is considered modern from the year 1985. The graph demonstrates the rapid modernization of the PLAAF since the year 2000 and displays the trends which are augmenting the PLAAF's ability to win Local Wars.

Most striking is the level of modernization in the ground attack force: it is currently completely made up of fourth or near-fourth generation aircraft. The rapid modernization of this segment of the PLAAF shows compelling evidence of a wider shift from an air defense focus to a multi-mission, especially strike, focus for the PLAAF. Compared to the bomber arm which currently has no modern aircraft, it appears that the indications given by the PLAAF's force structure also holds true in its force composition: the modernization of both aircraft categories indicates a PLAAF focus on targets within the First Island Chain. Such a posture is consistent with the Local Wars doctrine and is one indication that the doctrine is indeed shaping the PLAAF's modernization.

As the PLAAF's modernization trends continue, China's air force is likely to have greater and greater military capabilities, increasing its ability to decisively act in contingencies along its borders. In other words, it will be more capable of fighting and winning Local Wars.

Figure 7.7: Percentage of PLAAF Aircraft Modern



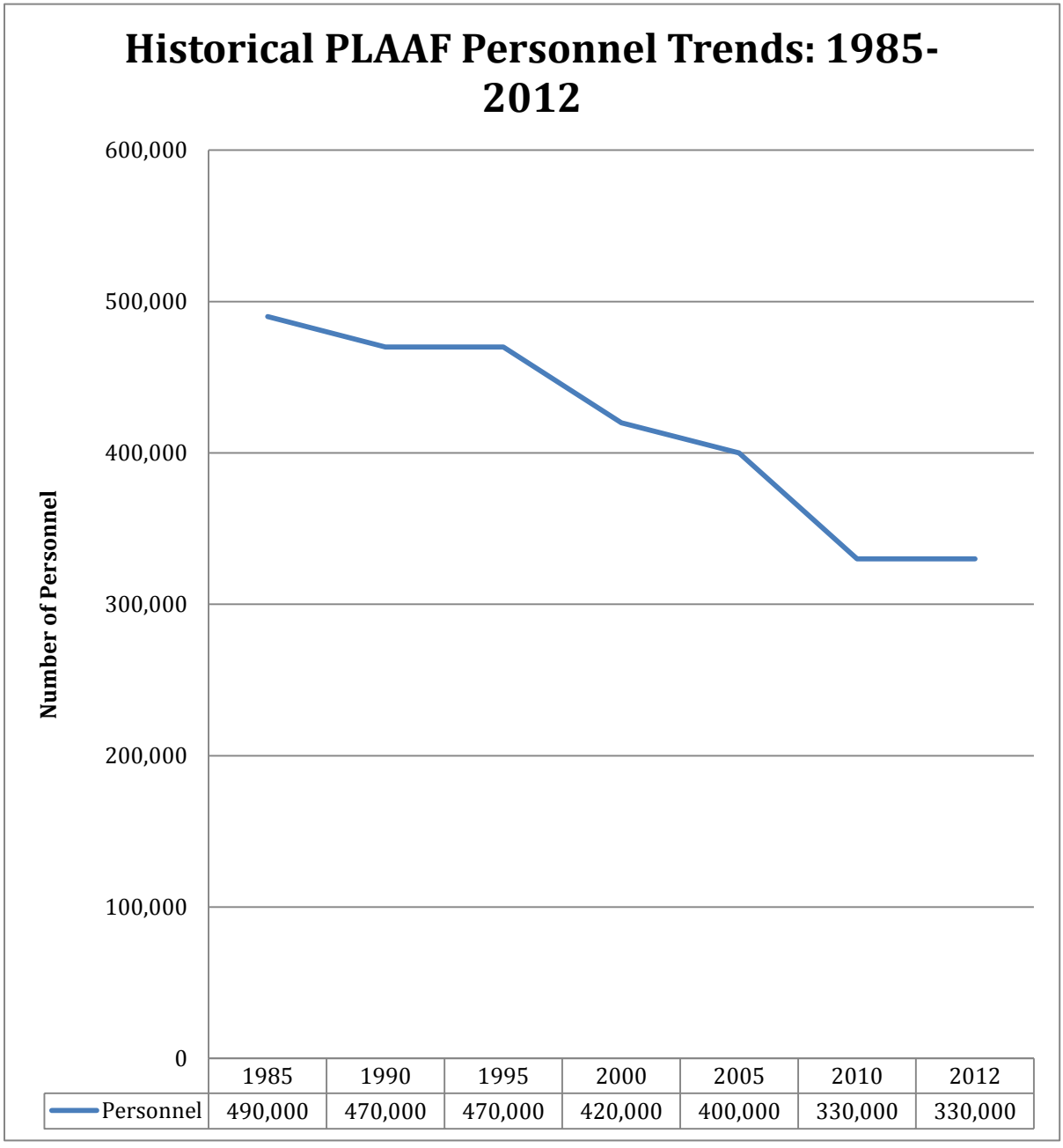
	1985	1990	1995	2000	2005	2010	2012
Percentage Modern	0.00	0.00	0.48	2.17	8.11	23.56	34.55
Percentage Bombers, Modern	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Percentage Fighters, Modern	0.00	0.00	0.60	6.40	8.33	21.45	19.10
Percentage FGA/Attack, Modern	0.00	0.00	0.00	0.00	8.21	35.98	77.57

Source: IISS. *Military Balance* 1985-2012.

Shift in Manpower

The PLAAF's manpower policies have sought to reduce the size of the PLAAF while improving the combat and leadership skills of its personnel. The PLAAF aims to achieve the second goal by increasing the realism of training, offering academic courses to currently serving personnel, and conducting military exercises with other countries.

Figure 7.8: PLAAF Manpower Trends



Source: IISS. *Military Balance* 1985-2012.

The PLAAF has emphasized "realistic" combat training which simulates force on force engagements in accordance with the 2009 *Outline of Military Training and Evaluation*. Such training forces the PLAAF's personnel to compete with an opposing force over objectives in a complex electro-magnetic environment. As part of this process, the PLAAF emphasizes the following four "guiding thoughts"; "adapt to the revolution in military affairs, prepare for battles to combat Taiwan's independence, integrate advanced equipment into the PLAAF, and counter an excessive focus on safety during training."[181]

In addition to realistic training, the PLAAF has sought to develop a grass-roots movement towards self-education and academic achievement within the ranks. In addition to formal military education institutions, which offer high-school through doctoral degrees, there exist online, correspondence, and short-term courses in which 60% of enlisted soldiers and officers have reportedly taken part.[182] These educational efforts are aided by information-technology communications. Also important, there are significant numbers of PLAAF officers that enroll in graduate programs at civilian universities.[183]

The PLAAF has been an active participant in joint military exercises. As recently as 2010, the PLAAF conducted bilateral exercises with Turkey that involved PLAAF fighters flying to Turkey and refueling in flight. Furthermore, PLAAF fighters used bases in the PRC to fly over Kazakhstan during PEACE MISSION 2010, a Shanghai Cooperation Organization military exercise.[184] These exercises indicate that the PLAAF is not only practicing necessary combat skills, but also practicing long-distance flight.

Conclusion

The PLAAF's efforts to alter its force structure, equipment composition, and manpower policies have resulted in a force more suited to fighting Local Wars. The shift from an air-defense to a multi-mission air force enables the PLAAF to support the wider PLA in multiple ways, whether through fire support, air defense, or transport. Moreover, the planes flown by the PLAAF are steadily becoming more capable, a trend which ensures that the PLAAF is gaining combat power faster than a pure force structure analysis would indicate. The synergy between force restructuring, aircraft modernization, and manpower policies ensure that the PLAAF will be consistently become more capable of fighting and winning Local wars as its modernization program continues.

It is important to note, however, that only one third of the PLAAF's aircraft are modern, that modern fighter-interceptors only account for ~20% of the fighter arsenal, and that numerous categories such as C2, ELINT, and AEW&C aircraft are just beginning to enter the PLAAF. Despite the PLAAF's improvements, it still has much more development ahead of itself before it becomes equivalent to a Western or Russian air force.

Chapter 8: PLA Second Artillery Corps

Of the PLA's three services and independent branch, the Second Artillery Corps has undergone what is arguably the most significant transformation since the 1980's. Since 1985, the SAC has shifted from a nuclear deterrent force based primarily on intermediate and medium-range missiles to a force of intercontinental and medium range nuclear forces combined with a powerful conventional missile arm capable of conducting precision attacks out to medium range. With the introduction, since 1985, of intercontinental nuclear missiles, as well as new modernized missile classes, the SAC is now capable of credibly deterring adversaries at intercontinental ranges. Moreover, with the introduction of conventional short-range ballistic missiles (SRBM's), medium-range ballistic missiles (MRBM's), and land attack cruise missiles (LACM's), the SAC is now capable of conventionally holding at risk adversary forces within 1,500 km of China. These significant changes are the result of doctrinal changes made during the 1980's which fundamentally altered the SAC's overarching mission, as well as its position within the wider-PLA.

SAC Service Strategy

During the 1980's, the CMC ordered the SAC to operate according to the concept of "Dual Deterrence and Dual Operations." This doctrine was developed in response of the recent changes in the nature of modern warfare, and the CMC believed that it required both a conventional strike capability and augmented security for its nuclear deterrent. As the *Science of Second Artillery Campaigns* states:

> In the late 1980s, the Central Military Commission assigned the Second Artillery Corps the mission to build and develop a conventional guided missile force. Especially after the Gulf War, the PLA, under the correct leadership of President Jiang Zemin (江泽民), formulated the military strategic guidelines of the new era. To meet the needs of future high tech local wars, the Central Military Commission issued the new task of "dual deterrence and dual operations" and set up a new conventional guided missile force.[185]

The basic logic of dual deterrence and dual operations was that both conventional and nuclear missile capabilities could deter China's adversaries, while both conventional and nuclear operations were necessary in wartime. By nuclear operations, the SAC refers to nuclear counter-attack and nuclear deterrence operations.

The requirements placed on the SAC by the new service strategy had significant implications for its force structure, equipment composition, and manpower policies. In the mid 1980's, the SAC was a force comprised mostly of medium and intermediate range nuclear and atomic weapons. The SAC had few intercontinental ballistic missiles (ICBM's) and no conventional capabilities. The requirements of the new service strategy created doctrinal and practical challenges. As the *Science of Second Artillery Campaigns* states, several theoretical changes had to occur:

> First is to shift the footing of the theoretical research of Second Artillery Corps campaigns from dealing with a nuclear war in the past to participating in a high tech local war under the condition of nuclear deterrence; Second is to shift the focus of the research from using the single nuclear means to accomplish the mission of nuclear counter attack in the past to using two types of means, both nuclear and conventional, namely to a mission of "dual deterrence and dual operations." Third is to change the content of research from focusing on strategizing in the past to focusing on a combined use of strategizing and technical means." [186]

When the PLA adopted the Local Wars concept in 1993, the SAC's dual deterrence and dual operations strategy easily fit into the new construct: the emphasis on developing a conventional strike capability fit in with the Local Wars requirements for long-range precision strikes.

As the following section will show, the SAC has succeeded in facing the theoretical and practical challenges of the CMC's imperatives and is currently in the process of a modernization and force development program designed to enable it to conduct dual deterrence, dual operations and to fight and win Local Wars.

Shifts in Force Structure, Equipment Composition, and Manpower

The SAC has responded to these twin imperatives by fundamentally altering its force structure, equipment composition, and manpower policies. Force structure changes are illustrated by the proliferation of missile categories and units within the SAC, as well as by the dual development of conventional and nuclear weapon systems.

Equipment-wise, the nuclear and conventional objectives necessitate similar capabilities: they both require missile systems which are mobile and survivable. However, the differing requirements of nuclear and conventional missile campaigns mean that the SAC requires both conventional missiles accurate enough to target mobile or small targets and nuclear missiles capable of evading and surviving enemy nuclear attacks. Neither capability is simple or easy to achieve: the SAC is still making progress toward both objectives.

As the data below indicate, however, the SAC has made significant progress in all of these capabilities compared to its position in 1985. In the conventional field, the SAC, which had no conventional missiles in 1985, now has the largest conventional missile arsenal in the Asia-Pacific.[187] Since 1985, the SAC has developed conventional systems which are mobile, solid-fueled, and precise or near-precise in accuracy.[188] Moreover, it has also developed indigenous cruise missiles and the resultant precision strike capability offered by such systems. In addition, these conventional systems now enjoy increased survivability due to the development of a reportedly 5,000 kilometer-long tunnel network[189] and improving PLAAF air defenses.[190]

The nuclear forces have also made significant progress. Since 1985 the SAC has retired much of its liquid-fueled nuclear missile arsenal. In turn, these systems have been replaced by new, solid-fueled, mobile missile systems. Unlike the conventional forces, however, the nuclear forces still retain a number of obsolete, liquid fueled missiles and still lack modern technologies such as MIRV's or ballistic missile defenses. Consequently, while the SAC's nuclear delivery modernization continues, it has yet to achieve a fully modern force.

All of these developments occur within the context of the SAC's effort to create a force capable of winning Local Wars along China's periphery. Consequently, the SAC has developed its strongest capabilities in precision-strike weapon systems which can hit targets within 600km of China's borders: the DOD estimates that the SAC has 1,200-1,700 SRBM's and GLCM's.**191** In addition, the SAC is reported by the DOD to be increasing its numbers of MRBM's, anti-ship ballistic missiles (ASBM's), and long-range GLCM's. Consequently, the SAC enables the PLA to mitigate some of the weaknesses still existent in its other branches. This dynamic, combined with the SAC's proven anti-satellite capability, illustrates the importance of the SAC to the PLA's Local Wars concept.

Shift in Force Structure

These developments, over the course of nearly three decades, are illustrated by a quantitative analysis of the SAC order of battle from 1985-2012. Figures 8.1-8.3 are drawn from IISS and show the historical trends in the Second Artillery manpower and missile strength. Figure 8.1 provides detailed quantitative data on the SAC's order of battle since 1985 while Figures 8.2-8.5 provide visual representation of that data.

Figure 8.1: Historical Quantitative Data on the SAC

IISS-Reported Historical Development of Ballistic and Cruise Missile Launchers 1985-2012							
	1985	1990	1995	2000	2005	2010	2012
DF-2 (CSS-1)	50	0	0	0	0	0	0
DF-3/A (CSS-2/ Mod)	60	60	60+	30+	2	2	2
DF-4 (CSS-3)	4	6	10+	20+	20	10	10
DF-5/A (CSS-4/ Mod 2)	2	2	7	20+	20	20	20
DF-21/A (CSS-5/ Mod1/2)	0	0	10	50+	33	80	80
DF-21C (CSS-5 Mod 3)	0	0	0	0	0	36	36
DF-21D (CSS-5 Mod 4) ASBM	0	0	0	0	0	0	6
DF-15 (CSS-6)	0	some	some	20	some	96	108
DF-11/ (CSS-7/ Mod 2)	0	some	some	40	some	108	108
DF-31 (CSS-9)	0	0	0	0	6	12	12
DF-31A (CSS-9 Mod 2)	0	0	0	0	0	24	24
DH-10 (CJ-10)	0	0	0	0	0	54	54

Source: IISS *Military Balance* 1985-2012.

Using data compiled from Figure 8.1, Figures 8.2 and 8.3 illustrate changes to the SAC's force structure. This comparison of both absolute and relative trends is necessary because absolute numbers alone do not indicate institutional change: it is necessary to tie changes in absolute numbers to changes in relative force structure. Figures 8.2 and 8.3 demonstrate such a change between 1985 and 2012: the SAC's evolving force structure illustrates a shift from a medium-intermediate range nuclear force to a bifurcated force dually dedicated to conventional short-medium range missions and a nuclear force capable of medium and intercontinental range strikes.

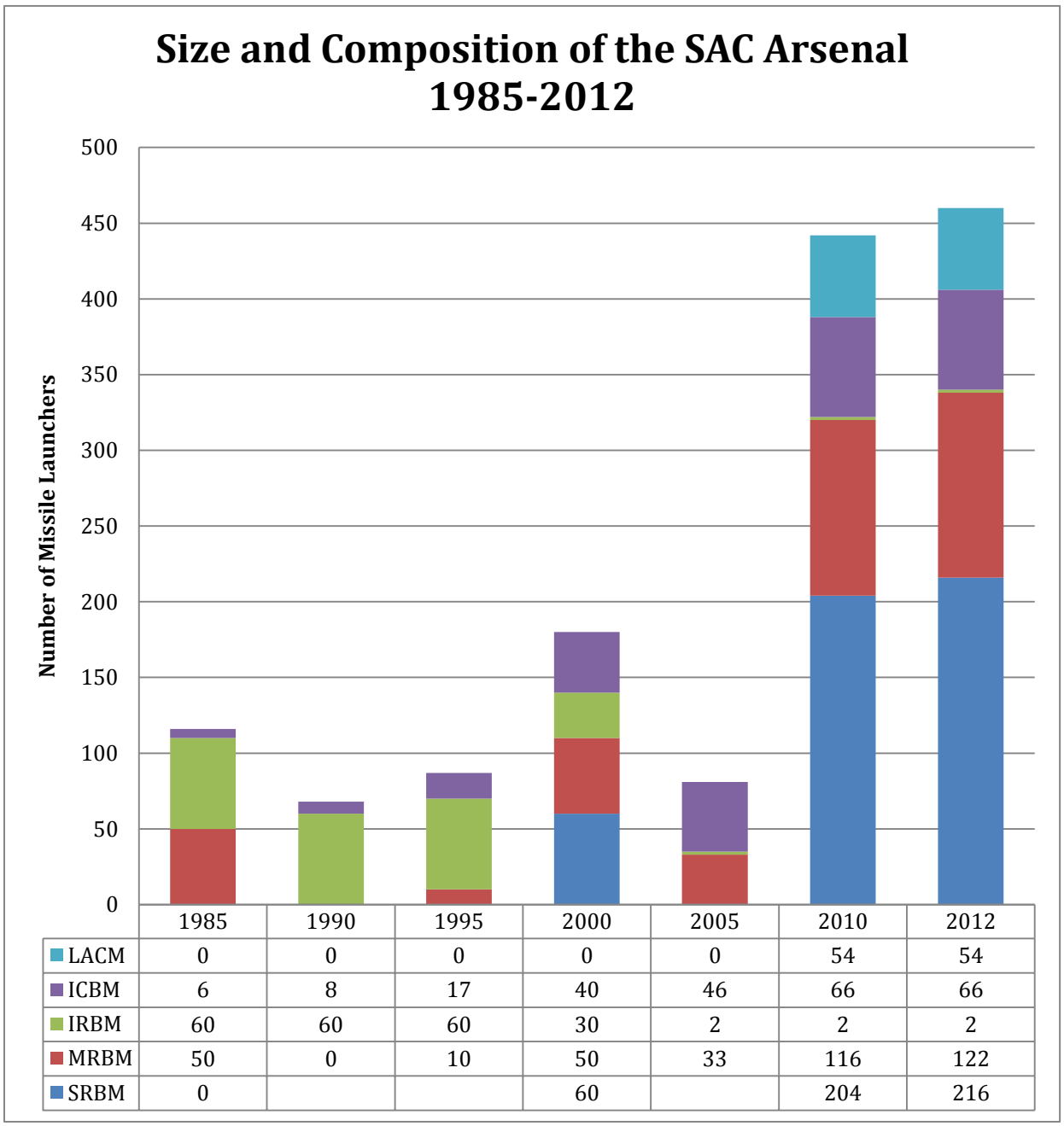
There are several key indicators of this shift from a medium-intermediate range nuclear force to a bifurcated multi-mission force shown in the two Figures. The first is the diminishing number of missile launchers solely suited to nuclear missions. Even if an observer ignores the DF-21C/D and counts the DF-21 series as a nuclear-only class, the percentage of the SAC's missile launcher strength suited only for nuclear missions drops from 100% in 1985 to slightly over 40% in 2012. Thus, roughly 60% of the current SAC arsenal can conduct effective conventional missions and thus contribute to victory in non-nuclear Local Wars under Conditions of Informatization. As the Figures show, the reason for this significant change is the introduction of precision or near-precision strike SRBM's and LACM's. When SRBM's first appear on the graph in 2000, they account for 30% of the SAC's missile launchers: by 2012, SRBM's account for nearly 50% of the SAC's missile launchers. This change is complemented by the introduction of cruise missiles into the SAC: by 2010, LACM's account for roughly 10% of SAC strength. These trends occur in contrast to the effective destruction of the SAC's nuclear intermediate-range ballistic missile (IRBM) force. In 1985, the SAC's nuclear IRBM's accounted for over 50% of the force: by 2012, the total is roughly 0.5%.

The second force structure indicator of a shift in SAC doctrine and capability is the significant growth in the relative size of the ICBM arsenal. Not only does the ICBM force increase in relative size from 5% to 14%, much of the growth is caused by modern DF-31 and DF-31A ICBM's. This trend may be an indication of a shifting priority from regional and Eurasian deterrence missions to intercontinental deterrence missions. Consequently, not only have the SAC's equipment holdings betrayed a shift from nuclear to nuclear and conventional missions, it is possible that the same equipment holdings also indicate a shift in the priority of nuclear deterrence missions.

The third shift is the change in the geographic range of the force. In 1985, 100%[4] of the SAC's missile force could reach the critical US base at Guam, located in the second island chain.[192] In 2012, the composition of the SAC is such that only roughly 15% of the SAC can hit the critical US base at Guam. What this change indicates is a significant shift in priorities from the second island chain and beyond to China's immediate periphery. Such a shift is fully in line with the Local Wars concept.

[4] However, given the DF-3A's NASIC-credited range of 1,900 miles, the DF-3A would have to be fired from the coast of the PRC at extreme range.

Figure 8.2: Historical Size and Composition of the SAC Arsenal

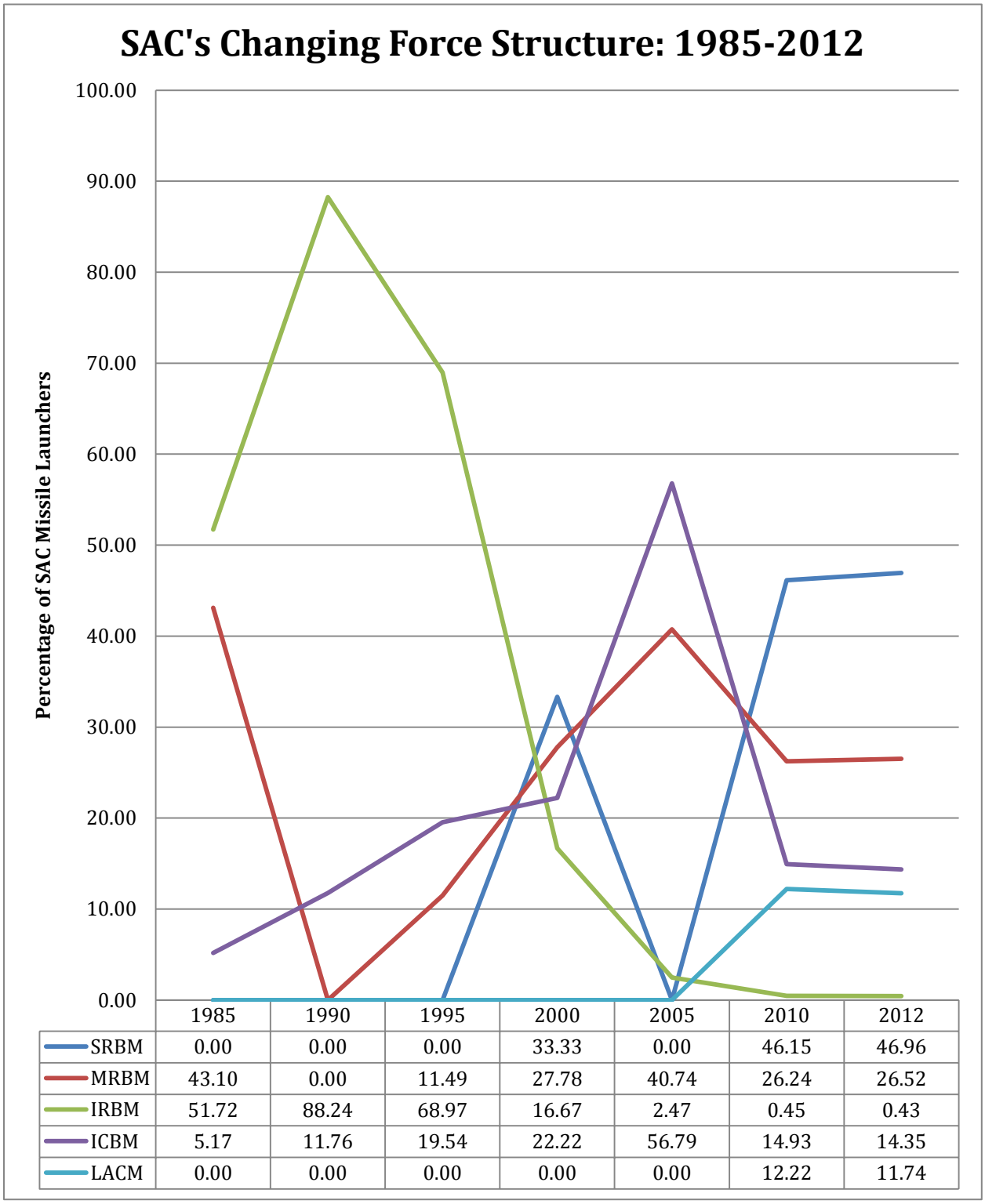


	1985	1990	1995	2000	2005	2010	2012
LACM	0	0	0	0	0	54	54
ICBM	6	8	17	40	46	66	66
IRBM	60	60	60	30	2	2	2
MRBM	50	0	10	50	33	116	122
SRBM	0			60		204	216

Source: IISS, *Military Balance* 1985-2012

Note: IISS lists total SRBM missile numbers, not SRBM missile launchers for 2005. Consequently, while it is possible to estimate the number of launchers, such estimates are very rough given uncertainty regarding missile-to-launcher ratios and the uneven distribution of both types of equipment to missile forces. Consequently, the authors have chosen to leave to leave the field for 2005 SRBM numbers blank, but it should be kept in mind that there was a sustained increase in SRBM launcher numbers between 200 and 2010.

Figure 8.3: SAC's Changing Force Structure



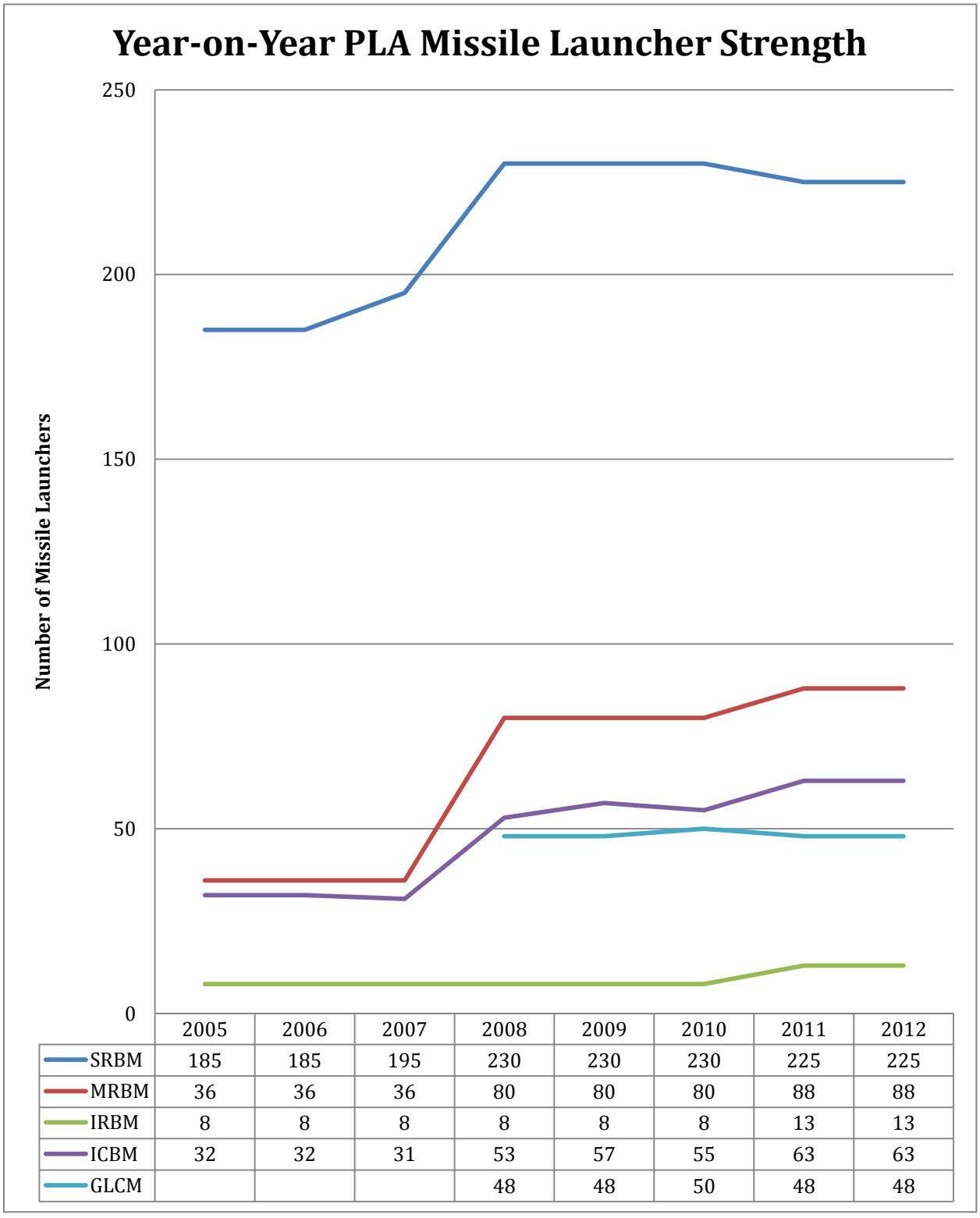
	1985	1990	1995	2000	2005	2010	2012
SRBM	0.00	0.00	0.00	33.33	0.00	46.15	46.96
MRBM	43.10	0.00	11.49	27.78	40.74	26.24	26.52
IRBM	51.72	88.24	68.97	16.67	2.47	0.45	0.43
ICBM	5.17	11.76	19.54	22.22	56.79	14.93	14.35
LACM	0.00	0.00	0.00	0.00	0.00	12.22	11.74

Source: IISS, *Military Balance 1985-2012*

Figures 8.1-8.3 relied on missile launcher numbers provided by IISS. However, the arsenal of actual missiles, not just missile launchers, also has important implications for the SAC's force structure. The number of missiles per missile launcher indicates military planning, operational concepts, and SAC progress towards its stated goals. Using DOD-reported data, it is possible to analyze the SAC's missile holdings. Consequently, Figure 8.4 shows DOD-reported numbers for year-on-year growth in SAC missile launchers while Figure 8.5 shows DOD-reported SAC missile strength trends from 2002 on a year-on-year basis.

The implications of Figures 8.4 and 8.5 are significant. The Figures show that, unlike every other missile category, the SRBM and LACM launchers are assigned a relatively large number of missiles per launcher. Moreover, trend lines indicate growing gaps between missile and missile launcher numbers leading to larger and larger reserve stockpiles of SRBM's and LACM's. This situation may indicate that the SAC plans to fire repeated salvos of SRBM's and LACM's during hypothetical contingencies. Consequently, unlike the SAC's inventory of medium and longer-range missiles, potential adversaries could face multiple salvos per SRBM or GLCM launcher, possibly in a counter-air role as proposed by RAND.[193] Such a capability falls perfectly in line with the conventional requirements of Local Warfare under Conditions of Informatization and, when supplemented by an increasingly secure nuclear second-strike, provides the larger PLA with critical capabilities necessary for fighting and winning Local Wars while deterring further escalation.

Figure 8.4: year-on-Year Missile Launcher Strength



	2005	2006	2007	2008	2009	2010	2011	2012
SRBM	185	185	195	230	230	230	225	225
MRBM	36	36	36	80	80	80	88	88
IRBM	8	8	8	8	8	8	13	13
ICBM	32	32	31	53	57	55	63	63
GLCM				48	48	50	48	48

Source: DOD, *Military Power of the People's Republic of China* 2005-2008; *Military and Security Developments Involving the People's Republic of China* 2009-2012.

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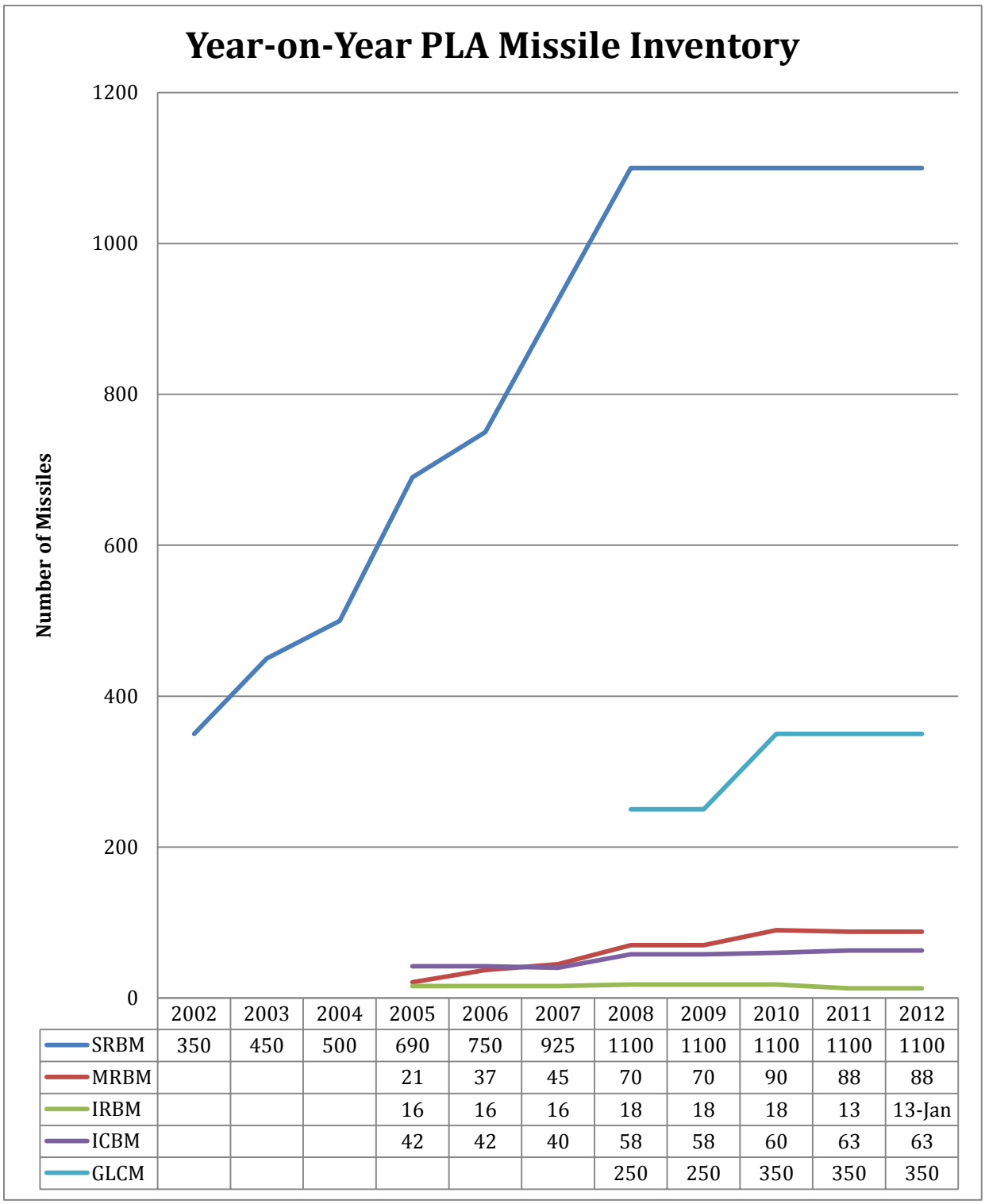
Figure 8.5: Year-on-Year Missile Inventory



	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
SRBM	350	450	500	690	750	925	1100	1100	1100	1100	1100
MRBM				21	37	45	70	70	90	88	88
IRBM				16	16	16	18	18	18	13	13-Jan
ICBM				42	42	40	58	58	60	63	63
GLCM							250	250	350	350	350

Source: DOD, *Military Power of the People's Republic of China* 2005-2008; *Military and Security Developments Involving the People's Republic of China* 2009-2012.

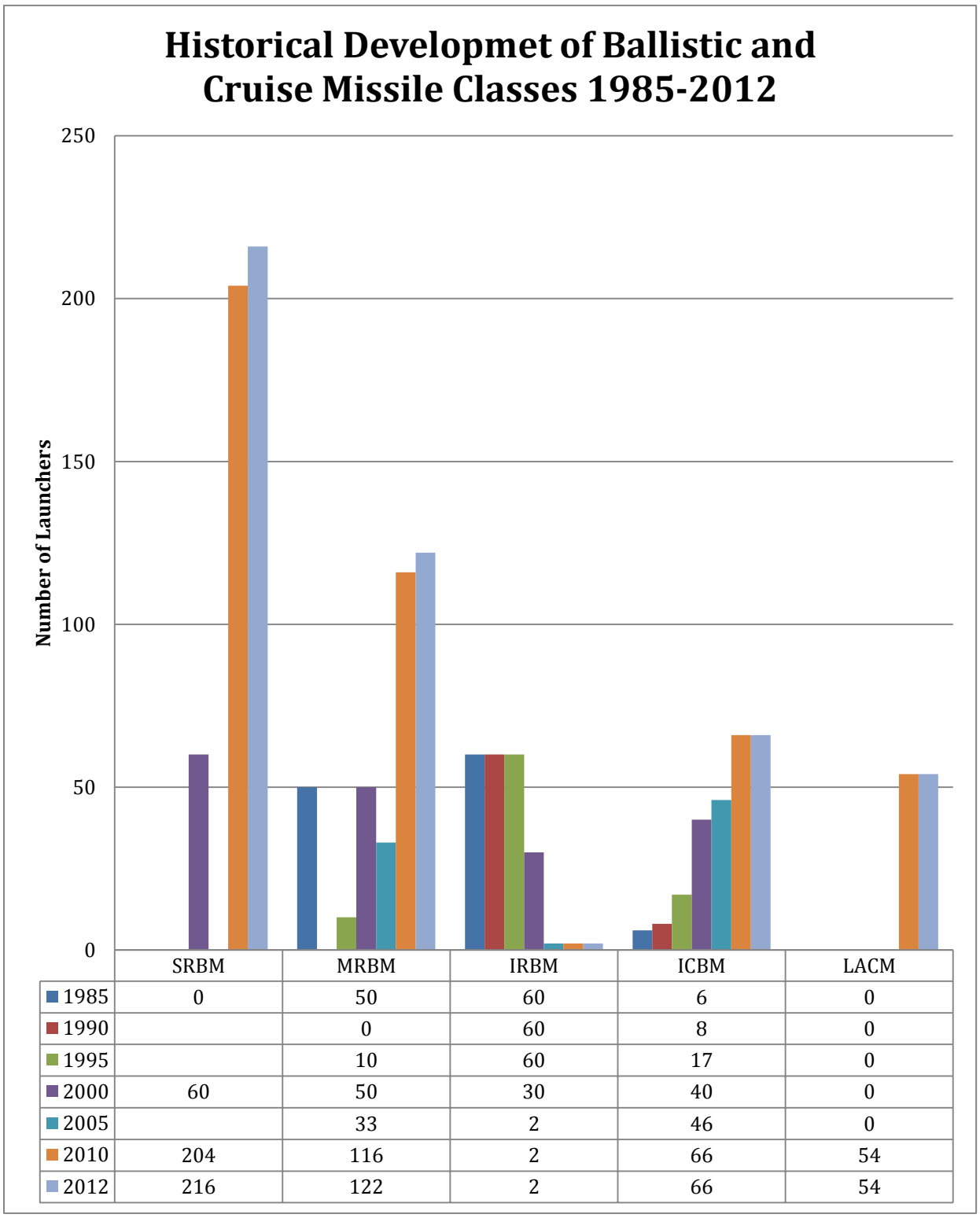
Shift in Equipment Composition

Figure 8.1 identifies several important trends in the modernization of the SAC. Since 1985, in line with the PLA concept of winning Local Wars under Conditions of Informatization, the SAC has reduced its relative holdings of non-mobile, liquid fueled missiles with nuclear warheads and shifted to a force structure heavily comprised of mobile, solid-fueled conventional missile systems. Moreover, since 1985, the SAC has introduced Short-Range Ballistic Missiles (SRBM's) into its arsenal: all are mobile and solid-fueled, enabling the SAC to conduct rapid strikes against regional threats while limiting the risk of preemption. Moreover, in line with the Local Wars concept, the SAC has increased the range of its SRBMs to improve their regional utility, created numerous variants for different purposes, and improved their accuracy. On this last point, the 2011 DOD Report states, "the PLA continues to field advanced variants with improved ranges and more sophisticated payloads that are gradually replacing earlier generations that do not possess true ―precision strike capability."[194] The development of mobile, solid-fueled Medium-Range Ballistic Missiles (MRBM's) also indicates this larger institutional shift, as "the PLA is acquiring and fielding conventional MRBMs to increase the range at which it can conduct precision strikes against land targets and naval ships, including aircraft carriers, operating far from China's shores out to the first island chain."[195] This trend is evident in the development of the more precise DF-21C and DF-21D missile systems.

The SAC's nuclear forces experienced a similar modernization experience. The need to deter the nuclear attacks on the mainland and, according to the *Science of Second Artillery Campaigns*, to reduce the scope of conventional warfare,[196] forced the SAC to increase the survivability of its nuclear counter-attack forces. In turn, this requirement necessitated mobility, rapid deployment, and quick firing of the missile system. Consequently, the SAC replaced the aging, liquid-fueled DF-2 MRBM with the solid-fueled mobile DF-21A/B MRBM. Between 1985 and 2000, the SAC not only completely retired the DF-2 but completely replaced it with nuclear-tipped DF-21's, missile for missile. Such a change in MRBM holdings illustrates several important elements of the SAC nuclear modernization: a shift from liquid to solid fuel, a shift from transportable to mobile systems, and a shift to more accurate missiles.

These trends are fully detailed in Figure 8.6, which provides a visual representation of the data and trends described above. Important elements to notice are the rapid expansion in SRBM numbers; the brief dip in MRBM numbers (the DF-2 to DF-21 series transition); the drawdown of IRBM's (China has yet to develop a mobile solid-fueled IRBM); the growth in ICBM's as the SAC seeks an invulnerable second-strike capability; and the sudden appearance of cruise missile units.

Figure 8.6: Development of Ballistic and Cruise Missiles



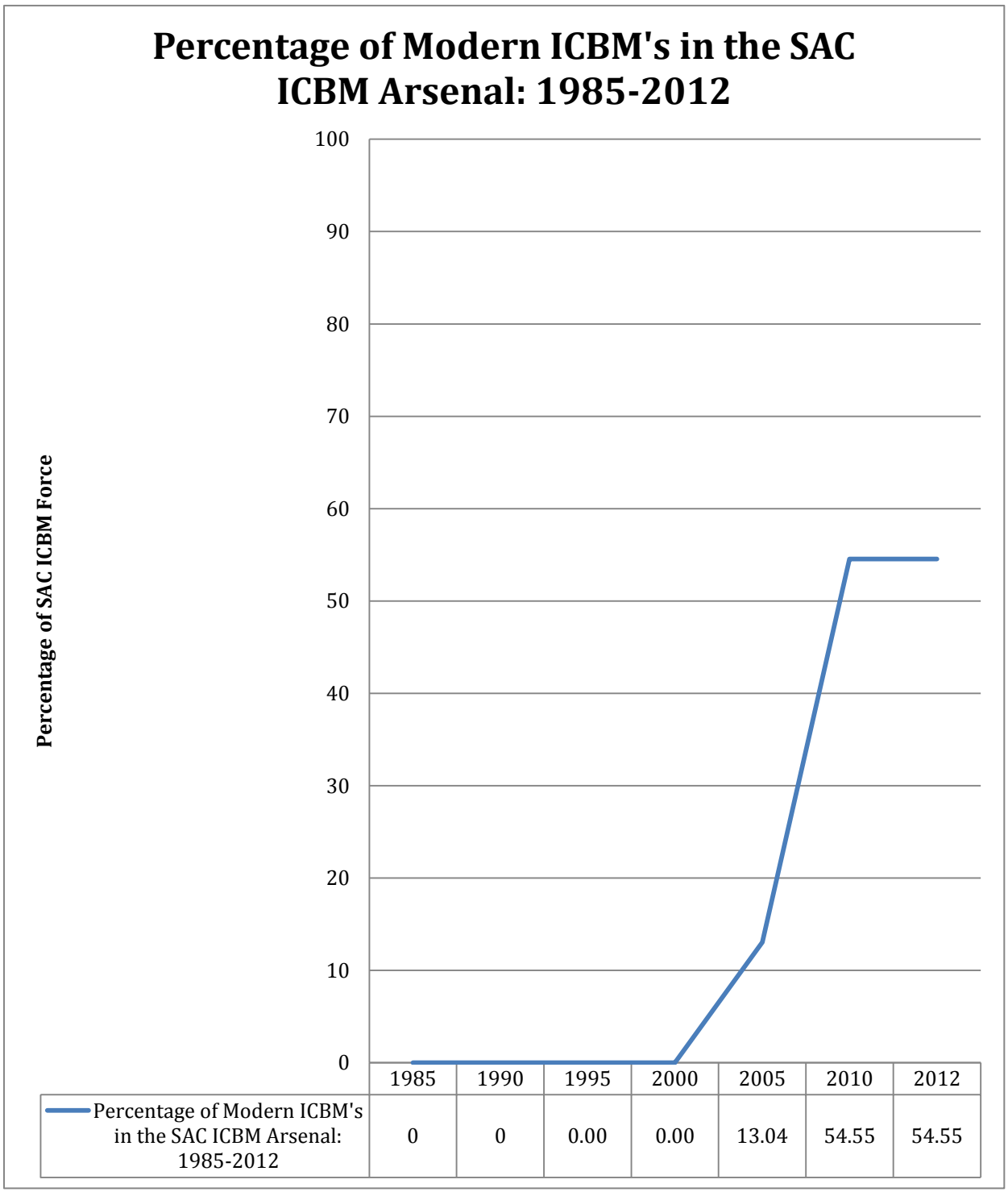
	SRBM	MRBM	IRBM	ICBM	LACM
1985	0	50	60	6	0
1990		0	60	8	0
1995		10	60	17	0
2000	60	50	30	40	0
2005		33	2	46	0
2010	204	116	2	66	54
2012	216	122	2	66	54

Source: IISS *Military Balance* 1985-2012

One of the drawbacks of Figure 8.6 is that it fails to display the significant changes in the SAC ICBM arsenal. The ICBM numbers in this Figure show a steady, linear increase in the ICBM force that masks the reality that obsolete ICBM's were being retired as more modern versions were produced. During this time period, the SAC reduced its holdings of its relatively vulnerable, liquid fueled, and non-mobile DF-4's while it deployed DF-31 and DF-31A ICBM systems. Consequently, it is necessary to combine this analysis of absolute ICBM numbers with an analysis of the relative modernization of the ICBM arsenal. Such an a combined analysis is not necessary for the other missile classes because the ICBM category is the only one in which the deployment of modern systems occurred at the same time as obsolete missiles were discarded: the culling of obsolete MRBM's happened before modern versions were produced, no modern IRBM's have been developed, and the SAC never had obsolete SRBM's or Land Attack Cruise Missiles (LACM's).

Figure 8.7 indicates that the introduction of the DF-31 and DF-31A significantly increased the percentage of the ICBM force that is modern. Consequently, the growth in ICBM numbers during the period 2005-2012 understates the growth in the SAC's intercontinental deterrence capability. Paired with improved PLAAF AD and the development of the SAC's tunnel network, the modernization of the SAC's ICBM arsenal has positive implications for the SAC's ICBM survivability, and thus for one of the SAC's two core missions.

Figure 8.7: Relative Modernity of the SAC's ICBM Force



Source: *Military Power of the People's Republic of China* 2005-2009; *Military and Security Developments Involving the People's Republic of China* 2009-2011.

The other important drawback of Figure 8.6 is that it fails to show the continual improvement, by the SAC, of its existing SRBM classes. An important trend captured by Figure 8.4 earlier in the chapter is the plateau and slight decrease in SRBM missile launcher numbers. However, this drop in force numbers does not necessarily indicate a drop in SRBM combat power. As the 2011 DOD Report states:

> As of December 2010, the PLA had somewhere between 1,000-1,200 SRBMs. The total number of SRBMs represents little to no change over the past year. However, the PLA continues to field advanced variants with improved ranges and more sophisticated payloads that are gradually replacing earlier generations that do not possess true 'precision strike' capability."[197]

Consequently, the DOD is confirming what has been reported throughout the decade in open-source literature: the SAC is creating new variants of both its DF-11 and DF-15 SRBM's which have improved range and, most importantly, significantly improved CEP (circular error probable). Consequently, a reduction in overall force numbers, if the result of a reduction in older SRBM's being replaced by fewer but newer SRBM's, will most likely result in an overall increase in SAC SRBM combat power.

A RAND report released in 2009 illustrates this point effectively. Comparing open-source information on various SAC SRBM classes and their variants, the report estimated the number of SRBM's needed to completely, albeit temporarily, neutralize the Republic of China (ROC) air force. The report drew two conclusions: first, older, less accurate SRBM's had very little conventional utility in precision-strike operations. Second, newer SRBM's with significantly improved CEP's are capable of achieving ambitious operational objectives with much fewer SRBM's than earlier variants of the same class. Figures 8.8 and 8.9 illustrate this situation.

Figure 8.8 is a graph which shows open-source data collected and used by RAND to estimate the parameters of the SAC's SRBM capability. Figure 8.9 uses that data to compute the number of SRBM's necessary to achieve a given probability of neutralizing a single runway.

As the Figures show, the replacement of newer SRBM's with precision strike capabilities has a significant impact on the combat utility of each individual SRBM. For example, the replacement of a DF-15 with a DF-15A, according to the RAND data, would augment the SAC's combat power by 500%: in other words, it would take 5 DF-15's to achieve the same probability of kill as a single DF-15A. Consequently, replacing older SRBM's with newer ones, even if not on a one-to-one basis, will significantly augment the SAC's SRBM-based combat power. Consequently, while the growth in SRBM numbers indicates growth in the SAC's SRBM capacity, the converse is not automatically true: a reduction in SRBM numbers, if the result of missile modernization, will result in significantly augmented SRBM-based combat power.

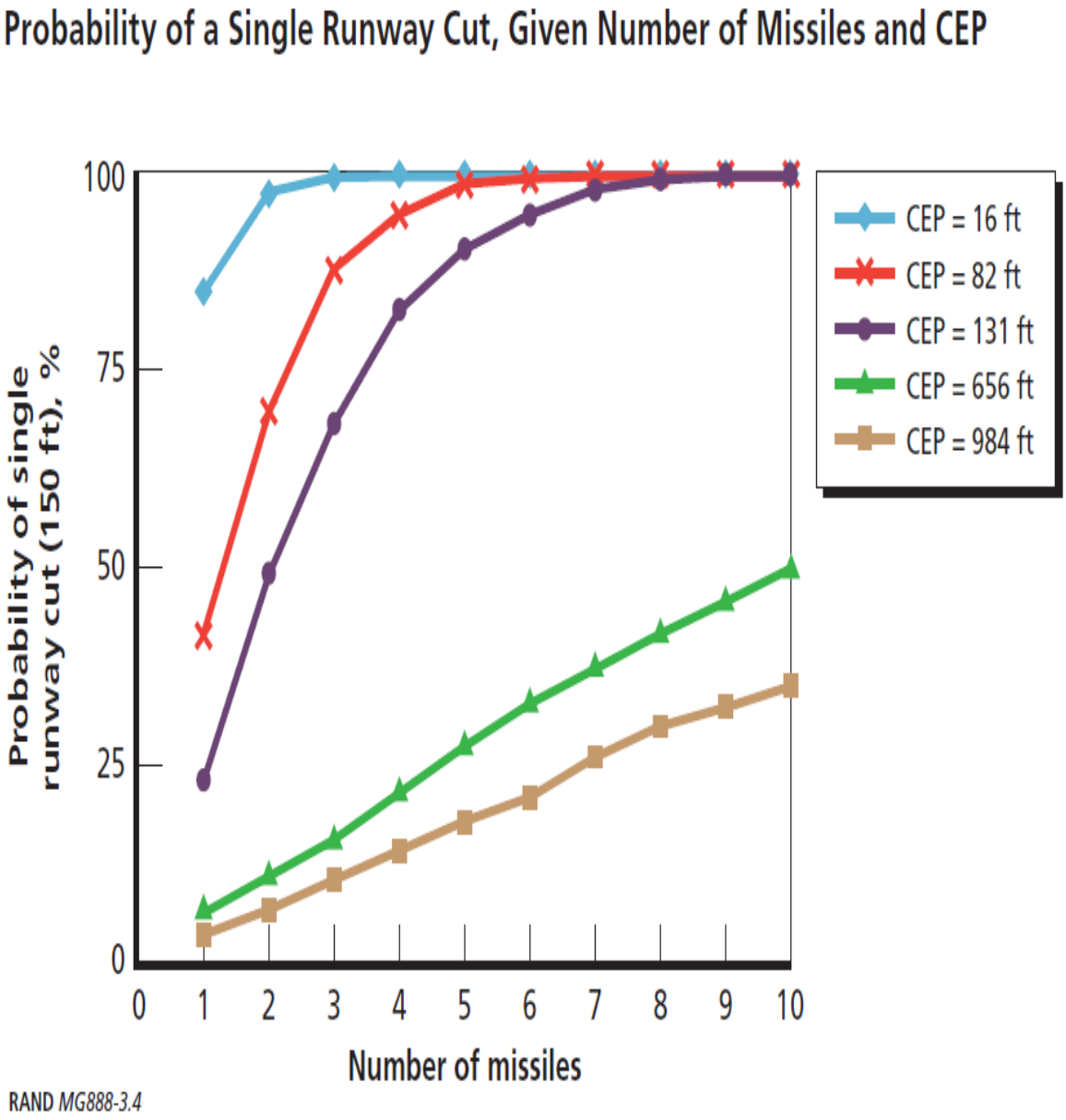
Figure 8.8: RAND Data on PRC SRBM's and the RAND "Notional SRBM" Model

Characteristics of CSS-7, CSS-6, and Notional SRBM

	CSS-7		CSS-6			Notional
Characteristic	DF-11	DF-11A	DF-15	DF-15A	DF-15B	SRBM
Range (km)	280–350	350–530	600	600	600	>280
Warhead (kg)	800	500	500	600	600	500
CEP (m)	600	20–30; 600 for oldest version	300	30–45	5	5, 25, 40, 200, 300
Number of missiles	675–715		315–355			900
Number of launchers	120–140		90–110			200

Source: RAND, *A Question of Balance:* Political Context and Military Aspects of the China-Taiwan Dispute. 34. http://www.rand.org/pubs/monographs/MG888.html

Figure 8.9: SRBM's Needed to Obtain Given Probabilities of Neutralizing a Single Runway



Source: RAND, *A Question of Balance:* Political Context and Military Aspects of the China-Taiwan Dispute. 41. http://www.rand.org/pubs/monographs/MG888.html

Shifts in Manpower Policies

The doctrinal, operational, tactical, and technical requirements generated by the SAC's modernization and development program have necessitated a SAC comprised of technically proficient officers and men with higher levels of human capital and academic achievement. This necessity has led to a shift in manpower policies toward greater formal military education of officers and men, greater recruitment of university graduates, and more intensive and realistic military training.

China National Defense in 2010 asserts that one of the main drivers for greater military spending is greater investments in training and education. If accurate, such spending has led to specialized military education institutions such as the Non-Commissioned Officer (NCO) School of the Second Artillery Force, which has been reported by Chinese media to have trained several thousand NCO's in the last three years.[198] Officers have also enjoyed the benefits of improving military education, as Chinese media also reports that officer's colleges have begun developing warfighting simulators and other training and education equipment based on information-technology.[199]

The recruitment of qualified personnel with undergraduate or graduate academic degrees has become a major SAC imperative. PLA media frequently cite some percentage of personnel in a given unit as undergraduate degree holders, emphasizing a self-reported increase in undergraduate degree holders. In one specific instance, it was claimed that a certain SAC brigade's officers were 85% undergraduate degree holders.[200]

The 2009 revision of the PLA's *Outline of Military Training and Evaluation* emphasized joint training, training in "complex electromagnetic environments," and the use of opposition forces to increase training realism:[201] the SAC seeks to develop these training techniques so as to better conduct integrated joint operations under conditions of informatization. It is impossible to discern if these new training regulations have had a significant effect on SAC forces, but Chinese media reports corroborate the new emphasis on "realistic training."[202] These media reports frequently describe training exercises along the lines of the 2009 OMTE, and one report from *Jiefangjun Huabao* describes joint training at the brigade level.[203] Such efforts, if carried out on a sustained and well-resourced basis, form a significant means of augmenting SAC combat skills.

Conclusion

The SAC's force development and modernization efforts indicate that it has sought to obtain both the conventional and nuclear capabilities necessary for fighting and winning Local Wars under Conditions of Informatization in the 21st century. However, the SAC's modernization and force development is an ongoing process, one that will likely continue into the near future.

The SAC's equipment procurement policies are fully in line with the Local Wars concept. The SAC has modernized is missile systems and obtained a conventional arsenal completely comprised of modern missiles that utilize solid-fuel and are road-mobile. Moreover, the SAC's conventional missile systems are increasing in accuracy, thus increasing the potency of a hypothetical SAC long-range precision strike. In addition, the nuclear element of the SAC's dual mission is enjoying similar progress, although the nuclear deterrent is lagging behind the conventional force in its development of a solid-fueled, mobile force: China's nuclear deterrent posture still partially relies on fixed, liquid fueled missiles.

The SAC's modernization and force development is not merely an issue of developing new missiles. The SAC has also fundamentally changed the force structure of its force in the last fifteen years, shifting from a medium-intermediate range nuclear force to a bifurcated force armed with a variety of missile categories, classes, and variants. The SAC is now capable of and required to carry out a variety of missions. Capabilities such as regional conventional precision strike, which did not exist in 1995, now make up more than half of the SAC's missile launcher arsenal.

At the operational level, the SAC is preparing to conventionally fight Local Wars. It has built a 5,000 kilometer long tunnel network to provide protection for its mobile missile systems, thus reducing the risk of preemption and complicating adversary targeting. Moreover, the forces with the greatest precision, the SRBM and LACM forces, have large numbers of reserve missiles per missile launcher, thus ensuring the possibility of sustained combat operations and repeated salvo fire. This combination of enhanced mobility, survivability, and large supplies of ammunition ensure that adversary forces in the region must operate in an environment in which there will be no sanctuaries within hundreds of kilometers with China if a conflict should start.

The nuclear forces also enjoy increased survivability, as the 5,000 kilometers of tunnel networks help protect a relatively small ICBM force which is, for now, dedicated to riding a nuclear first strike before retaliating.

These important developments come together to form a larger picture of a SAC in transition. It is currently modernizing its forces and developing a new force composition in accordance with the Local Wars theory. It is within this context that new weapon systems such as the DF-21D ASBM, Anti-Satellite missiles, and conventional DF-21C's are developed, deployed, and used.

Appendix 8.A: NASIC Data on the PLA's Missile Classes

All Data Taken from:

NASIC. *Ballistic and Cruise Missile Threat.* Wright-Patterson Air Force Base. April 2009. http://www.fas.org/programs/ssp/nukes/NASIC2009.pdf

Second Artillery Corps SRBM's

MISSILE	PROPELLANT	DEPLOYMENT MODE	MAXIMUM RANGE (MILES)
CHINA			
CSS-6 Mod 1	Solid	Road-mobile	370
CSS-6 Mod 2	Solid	Road-mobile	550+
CSS-6 Mod 3	Solid	Road-mobile	450+
CSS-7 Mod 1	Solid	Road-mobile	185
CSS-7 Mod 2	Solid	Road-mobile	370
CSS-8	1st stage: solid 2nd stage: liquid	Road-mobile	93
B611	Solid	Road-mobile	93

Second Artillery Corps MRBM/IRBM's

MISSILE	NUMBER OF STAGES	PROPELLANT	DEPLOYMENT MODE	MAXIMUM RANGE (MILES)	NUMBER OF LAUNCHERS*
China					
CSS-2	1	Liquid	Transportable (Limited Mobility)	1,900	5 to 10
CSS-5 Mod 1	2	Solid	Road-mobile	1,100+	Fewer than 50
CSS-5 Mod 2	2	Solid	Road-mobile	1,100+	Fewer than 50
CSS-5 Conventional	2	Solid	Mobile	1,100	Fewer than 30
CSS-5 ASBM	2	Solid	Mobile	900+	Not Yet Deployed

Second Artillery Corps ICBM's

Missile	Number of Stages	Warheads per Missile	Propellant	Deployment Mode	Maximum Range* (miles)	Number of Launchers
China						
CSS-3	2	1	Liquid	Silo & transportable	3,400+	10 to 15
CSS-4 Mod 2	2	1	Liquid	Silo	8,000+	About 20
CSS-10 Mod 1	3	1	Solid	Road-mobile	4,500+	Fewer than 15
CSS-10 Mod 2	3	1	Solid	Road-mobile	7,000+	Fewer than 15

Appendix 8.B: DOD Data on the PLA's Missile Classes

China's Missile Force			
System	**Missiles**	**Launchers**	**Estimated Range**
ICBM	50-75	50-75	5,500+ km
IRBM	5-20	5-20	3,000-5,500 km
MRBM	75-100	75-100	1,000-3,000 km
SRBM	1,000-1,200	200-250	< 1,000 km
GLCM	200-500	40-55	1,500+ km

Source: DOD. *Military and Security Developments Involving the People's Republic of China 2012*. Washington, DC: Office of the Secretary of Defense. 29. http://www.defense.gov/pubs/pdfs/2012_CMPR_Final.pdf

Chapter 9: Chinese Military Modernization and the Taiwan Strait Military Balance

Within the Asia-Pacific there exist three specific flashpoints which many analysts consider especially capable of generating conflict and potentially war: the South China Sea, the Korean Peninsula, and the Taiwan Strait. This report does not address all of these flashpoints or their impact on US and Chinese strategic relations. However, it does note that the Korean military balance has already been examined by a Burke Chair publication.[5]

Regarding the South China Sea, the multiplicity of claimants, as well as the numerous powerful states which have an interest in the shipping lanes in the region, precludes a relatively short exposition on the South China Sea military balance. However, the Taiwan Strait, given its mostly two-way balancing act, provides an ideal case for examining the effect of Chinese military modernization on an existing and continuous military balance.

The section below on the Taiwan Strait uses DOD-reported data to depict, over time, the US view of the changing balance in the Taiwan Strait over the last decade. Military balances are, by their nature, relative, and therefore they must exist between two or more countries. While numerous states have an interest in cross-strait relations, this study focuses on the People's Republic of China – Republic of China (ROC) military balance in the Taiwan Strait.

Historical Trends in the Taiwan Strait Military Balance

Figures 9.1-9.3 depict DOD-reported data on the military forces of the PRC and ROC, as well as a comparison of forces in the immediate vicinity of the Strait.[6] It is important to state that force numbers do not tell the whole story: differences in equipment quality, military doctrine, and personnel proficiency also influence the Taiwan Strait military balance. However, as the 2011 DOD Report states:

> "Taiwan has historically relied upon multiple factors to deter PLA aggression: the PLA's inability to project sufficient power across the 185 km Taiwan Strait; the Taiwan military's technological superiority; the inherent geographic advantages of island defense; and the possibility of U.S. intervention. China's increasingly modern weapons and platforms (over a thousand ballistic missiles, an anti-ship ballistic missile program, increasingly modern ships and submarines, combat aircraft, and improved C4ISR capabilities) threaten to negate many of those factors upon which Taiwan has depended."[204]

Consequently, China's ongoing military modernization, combined with the previously mentioned improvements in human capital, training, and military exercises, are eroding the effectiveness of the ROC's previous reliance on intangible factors. Thus, as intangible differences between the two forces are slowly eroding, tangible factors such as force numbers are becoming more important indicators of the Taiwan Strait military balance.

A military balance is inherently a dynamic and uncertain construct. While it is impossible to perfectly determine the magnitude of intangible variables and how they interact with the changes

[5] See *The Korean Military Balance 2011*. CSIS. http://csis.org/files/publication/110712_Cordesman_KoreaMilBalance_WEB.pdf

[6] PRC forces in the immediate vicinity of the Strait refers to ground forces in the Nanjing, Guangzhou, and Jinan Military Regions; naval forces in the East and South Sea Fleets; and aircraft within unrefueled operating range of Taiwan.

in force numbers, it is possible to determine the direction of the changing Taiwan Strait military balance. Given the changes in numbers, equipment, and training on both sides, it is possible to determine that the balance in shifting in the PRC's favor.

It is important to state that a military balance is also a relative construct. To say that trends are shifting in the PRC's favor does not indicate that the PRC could win a war with the ROC, that the PRC's combat power is greater than the ROC, or that the ROC's weapon systems are qualitatively inferior to PRC weapon systems. What it does mean is that, regardless of the previous situation of the military balance, the military balance between the two sides is becoming *relatively* more favorable to one side. Thus, a relative shift in the favor of one side could still occur in a situation in which that side is at a crushing disadvantage. It is important to remember this important distinction when examining the *relative* trends depicted in the following pages.

Figure 9.1 illustrates a brief summary of trends in force structure and strength of the PLA. Figure 9.2 displays trends in PLA forces in the immediate vicinity of the Taiwan Strait. Figure 9.3 shows trends in the force structure of the ROC armed forces.

It is important to note that additional PRC forces beyond the vicinity of the Strait can be committed to a Taiwan contingency.

Figure 9.1: A Summary of Trends in the PLA

PRC								
	2005	2006	2007	2008	2009	2010	2011	2012
Personnel (Active)	1,600,000	1,400,000	1,400,000	1,250,000	1,250,00	1,250,000	1,250,000	1,250,000
Group Armies	18	18	18	18	18	18	18	18
Infantry Divisions	20	25	25	19	19	19	17	-
Infantry Brigades	20	33	33	24	24	25	22	-
Mot. Infantry Divisions	-	-	-	-	-	-	-	18
Mot. Infantry Brigades	-	-	-	-	-	-	-	22
Mech. Infantry Divisions	5	-	-	4	4	4	6	8
Mech. Infantry Brigades	5	-	-	5	5	5	6	6
Armor Divisions	10	9	9	9	9	9	9	9
Armor Brigades	10	11	11	8	8	8	8	9
Artillery Divisions	5	3	3	2	2	2	2	2
Artillery Brigades	15	15	15	17	17	17	17	17
Airborne Divisions	*	3	3	3	3	3	3	3
Amphibious Divisions	-	-	-	2	2	2	2	-
Marine Brigades	2	2	2	3	3	3	3	2
Tanks	6,500	7,000	7,000	6,700	6,700	7,000	7,000	7,000
Artillery Pieces	11,000	11,000	11,000	7,400	7,400	8,000	8,000	8,000
Destroyers	21	25	25	29	25	25	26	26
Frigates	43	45	47	45	48	49	53	53
Tank Landing Ships	20	25	25	26	27	27	27	28
Medium landing Ships	23	25	25	28	28	28	28	23
Diesel Attack Submarines	51	50	53	54	54	54	49	48
Nuclear Attack Submarines	6	5	5	5	6	6	5	5

Coastal patrol (Missile)	51	45	41	45	70	85	86	86
Fighters	1,500	1,525	1,550	1,630	1,655	1,680	1,680	1,570
Bombers/Attack	780	775	775	620	645	620	620	550
Transport	500	450	450	450	450	450	450	300

*Included in figures for Infantry Division

Source: DOD, *Military Power of the People's Republic of China* 2005-2008; *Military and Security Developments Involving the People's Republic of China* 2009-2012.

Figure 9.2: Trends in PLA forces deployed in the vicinity of the Taiwan Strait

PRC (Taiwan Strait Area)								
	2005	2006	2007	2008	2009	2010	2011	2012
Personnel (Active)	375,000	400,000	400,000	440,000	400,000	400,000	400,000	400,000
Group Armies	9	8	8	8	8	8	8	8
Infantry Divisions	9	9	9	8	8	6	5	-
Infantry Brigades	11	12	12	11	11	11	9	-
Mot. Infantry Divisions	-	-	-	-	-	-	-	5
Mot. Infantry Brigades	-	-	-	-	-	-	-	11
Mech. Infantry Divisions	3	-	-	1	1	1	2	4
Mech. Infantry Brigades	1	-	-	1	1	1	1	1
Armor Divisions	4	4	4	4	4	4	4	4
Armor Brigades	4	4	4	3	3	3	3	4
Artillery Divisions	3	3	3	2	2	2	2	2
Artillery Brigades	5	5	5	6	6	6	6	6
Airborne Divisions	*	3	3	3	3	3	3	3
Amphibious Divisions	-	-	-	2	2	2	2	-
Marine Brigades	2	2	2	3	3	3	3	2
Tanks	2,500	2,700	2,700	2,800	2,800	3,100	3,100	3,100
Artillery Pieces	5,500	3,200	3,200	2,900	2,900	3,400	3,400	3,400
Destroyers	13	16	16	17	17	15	16	16
Frigates	34	40	40	36	39	40	44	44
Tank Landing Ships	20	22	22	24	25	25	25	26
Medium landing Ships	15	20	20	23	23	23	21	18
Diesel Attack Submarines	29	28	28	32	32	32	33	30

Nuclear Attack Submarines	-	-	-	1	1	2	2	2
Coastal patrol (Missile)	34	34	34	35	55	65	68	67
Fighters	425	425	425	330	330	330	330	310
Bombers/Attack	280	275	275	160	160	160	160	180
Transport	50	75	75	40	40	40	40	40

*Included in figures for Infantry Division

Source: DOD, *Military Power of the People's Republic of China* 2005-2008; *Military and Security Developments Involving the People's Republic of China* 2009-2012.

Figure 9.3: Trends in the ROC Armed Forces

ROC								
	2005	2006	2007	2008	2009	2010	2011	2012
Personnel (Active)	200,000	130,000	130,000	130,000	130,000	130,000	130,000	130,000
Group Armies		3	3	3	3	3	3	3
Infantry Divisions	-	-	-	-	-	-	-	-
Infantry Brigades	25	13	13	8	8	8	8	-
Mot. Infantry Divisions	-	-	-	-	-	-	-	-
Mot. Infantry Brigades	-	-	-	-	-	-	-	8
Mech. Infantry Divisions	-	-	-	-	-	-	-	-
Mech. Infantry Brigades	3	-	-	3	3	3	3	3
Armor Divisions	-	-	-	-	-	-	-	-
Armor Brigades	5	5	5	5	5	4	4	4
Artillery Divisions	-	-	-	-	-	-	-	-
Artillery Brigades	-	3+	3+	5	5	5	5	5
Airborne Divisions	-	-	-	-	-	-	-	-
Amphibious Divisions	1	-	-	-	-	-	-	-
Marine Brigades	3	2	2	3	3	3	3	2
Tanks	1,900	1,800	1,800	1,100	1,100	1,100	1,100	1,100
Artillery Pieces	4,400	3,200	3,200	1,600	1,600	1,600	1,600	1,600
Destroyers	6	2	4	4	4	4	4	4
Frigates	21	22	22	22	22	22	22	22
Tank Landing Ships	12	12	12	12	12	12	12	12
Medium landing Ships	4	4	4	4	4	4	4	4
Diesel Attack Submarines	4	4	4	4	4	4	4	4
Nuclear Attack Submarines								

	-	-	-	-	-	-	-	-
Coastal patrol (Missile)	50	50	50	51	59	61	61	61
Fighters	420	330	330	390	390	388	388	388
Bombers/Attack	-	-	-	-	-	22	22	22
Transport	40	40	40	40	40	21	21	21

Source: DOD, *Military Power of the People's Republic of China* 2005-2008; *Military and Security Developments Involving the People's Republic of China* 2009-2012.

The Naval Balance

The numerical indicators presented in Figures 9.2 and 9.3 indicate a changing naval balance in the Taiwan Strait in the favor of the PRC. The Figures for the years 2005-2012 indicate that, while Taiwan has kept its naval force numbers at a relative standstill (with the exception of patrol craft), the PRC has engaged in a constant, if moderate, increase in the number of naval forces allocated to the Taiwan Strait.

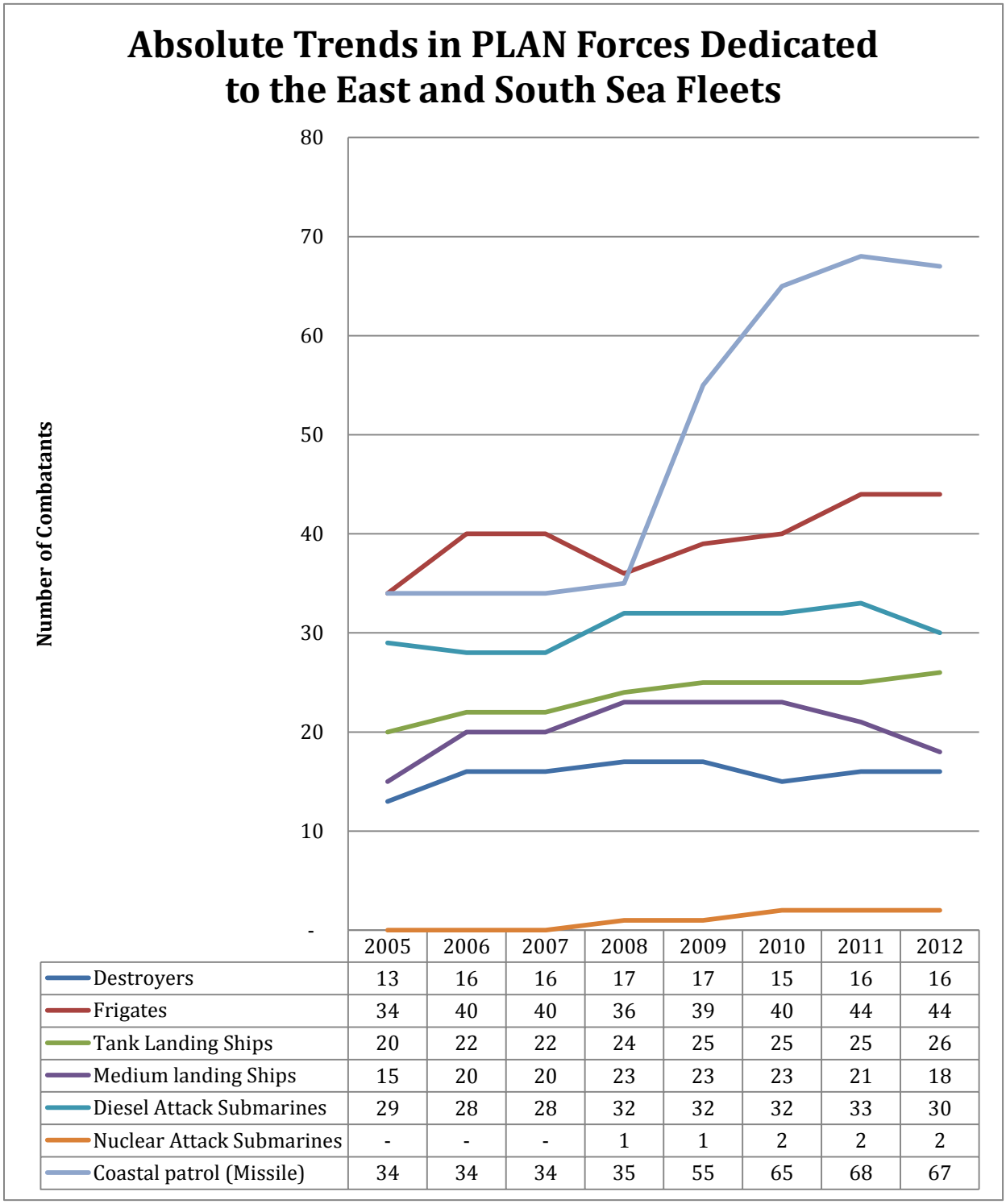
Figures 9.4 and 9.5 illustrate the numerical changes in naval forces on both sides. They indicate that the PLAN has allocated significantly larger numbers of patrol craft, frigates, and tank landing ships to the East and South Sea Fleets. In addition, there were moderate increases in the number of destroyers and medium landing ships. Perhaps most significantly, the PLAN allocated two nuclear attack submarines (one in 2008 and another in 2010), when historically all of the PLAN's SSN's have been concentrated in the North Sea Fleet.

In contrast, the ROC Navy deployed significantly more patrol craft, but saw few increases in any other ship category. One additional frigate was deployed in the fleet, but two destroyers were decommissioned in return. While the ROC has historically relied on quality, rather than quantity, to militarily balance the PRC, the increasing numerical advantage of the PLAN as well as the ongoing PLAN modernization program, which has resulted in advanced combatants such as the Luyang II DDG, indicate that the naval balance in the Strait is shifting in the favor of the PLAN.

It is important to note that the symmetric comparison presented here has significant drawbacks. Both sides operate land-based anti-ship cruise missiles, maritime-strike aircraft, land-based artillery, and electronic and cyberwarfare forces. Moreover, the PRC has a reportedly-operational anti-ship ballistic missile. Successes or failures by either side in the air, space, land, and cyber domains, as well as the electro-magnetic spectrum, will have significant results on naval combat. In addition, both the PRC and the ROC are attempting to realize joint operations among their services. All of these variables will influence naval combat. However, the lack of reliable data on many of these variables, and the intangible nature of others, preclude effective comparison. Consequently, this study presents naval force numbers in the Strait in order to provide a quantitative analysis of one portion of the military balance.

Figures 9.4 and 9.5 show these absolute trends.

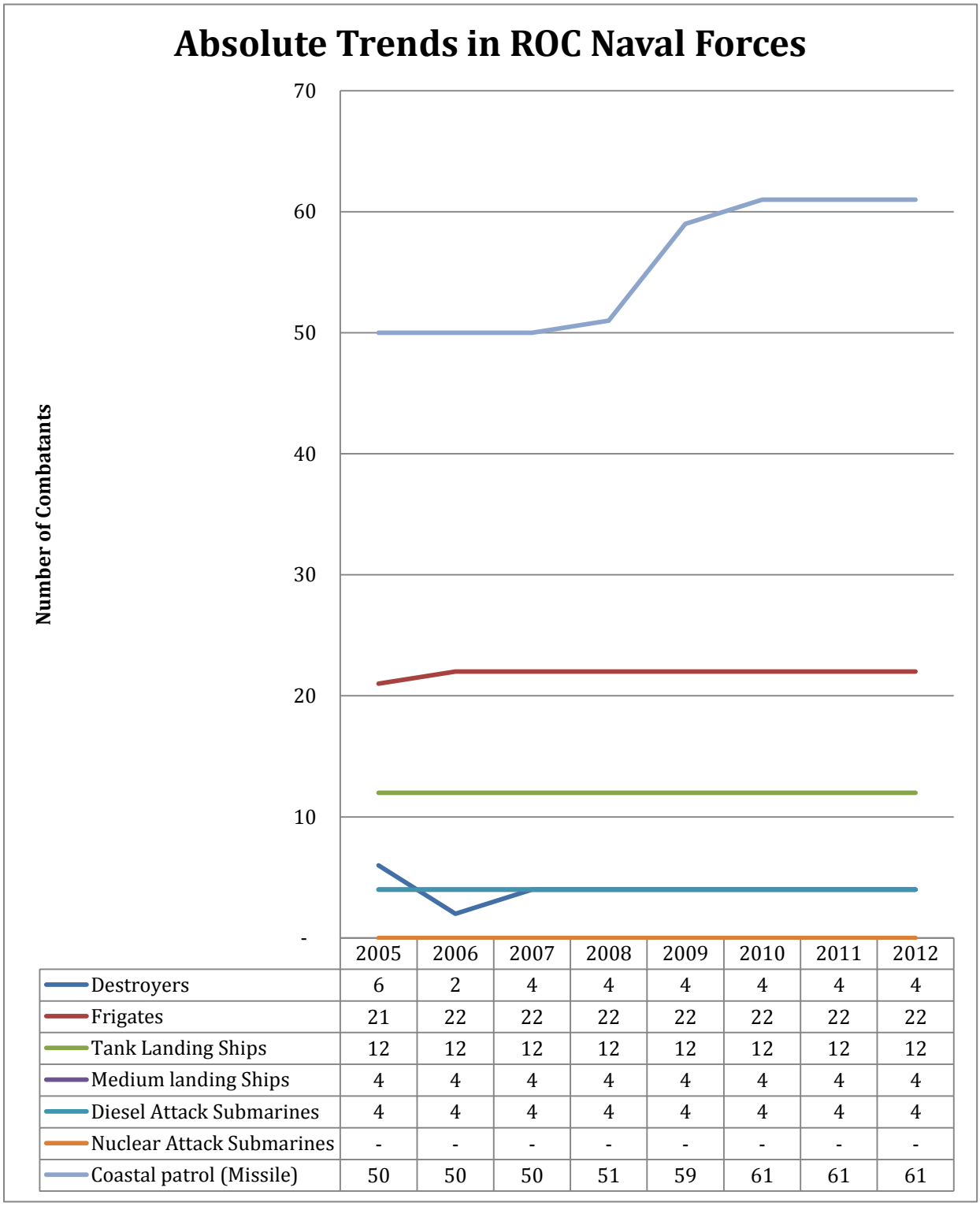
Figure 9.4: Absolute Trends in PLAN Deployments to the East and South Sea Fleets



	2005	2006	2007	2008	2009	2010	2011	2012
Destroyers	13	16	16	17	17	15	16	16
Frigates	34	40	40	36	39	40	44	44
Tank Landing Ships	20	22	22	24	25	25	25	26
Medium landing Ships	15	20	20	23	23	23	21	18
Diesel Attack Submarines	29	28	28	32	32	32	33	30
Nuclear Attack Submarines	-	-	-	1	1	2	2	2
Coastal patrol (Missile)	34	34	34	35	55	65	68	67

Source: DOD, *Military Power of the People's Republic of China* 2005-2008; *Military and Security Developments Involving the People's Republic of China* 2009-2012.

Figure 9.5: Absolute Trends in ROC Naval Forces



	2005	2006	2007	2008	2009	2010	2011	2012
Destroyers	6	2	4	4	4	4	4	4
Frigates	21	22	22	22	22	22	22	22
Tank Landing Ships	12	12	12	12	12	12	12	12
Medium landing Ships	4	4	4	4	4	4	4	4
Diesel Attack Submarines	4	4	4	4	4	4	4	4
Nuclear Attack Submarines	-	-	-	-	-	-	-	-
Coastal patrol (Missile)	50	50	50	51	59	61	61	61

Source: DOD, *Military Power of the People's Republic of China* 2005-2008; *Military and Security Developments Involving the People's Republic of China* 2009-2012.

Figures 9.4 and 9.5 indicate that, while the ROC's forces have been largely numerically stagnant, the PLAN's deployments to the Taiwan Strait have been moderately and in some cases, significantly, increasing.

However, the PRC and ROC are not engaging in a symmetric competition. The ROC has mostly based its defense strategy on assumptions of numerical inferiority, qualitative superiority, and asymmetric strategic imperatives. Consequently, a more meaningful assessment compares *relative* changes in the Taiwan Strait balance to compare the changing balance of forces. Thus, regardless of strategic assumptions, a changing relative balance indicates a meaningfully changing military balance, and thus changing effects on bilateral relations.

Figures 9.6 and 9.7 illustrate this changing relative balance by using 2005 as a baseline, and charting relative increases in force numbers on both sides. Thus, even assuming a ROC strategic posture based on operating against numerically larger forces, such a comparison enables an observer to identify a military balance in flux in the PRC's favor. As the data in both Figures show, the ROC's naval forces are being forced to deter or defeat larger numbers of the PRC's forces *per individual ROC combatant.*

This outcome comes from numerous trends within both navies. On the PLAN side, nearly every ship category has seen an over 20% increase in force numbers since 2005. Importantly, nuclear submarines have been newly introduced into the region, and so do not appear on the Figures below because the PLAN's nuclear submarine force strength has increased by an infinite percentage. Also impressive, the PLAN's patrol craft force has increased by nearly 100% over its 2005 figure.

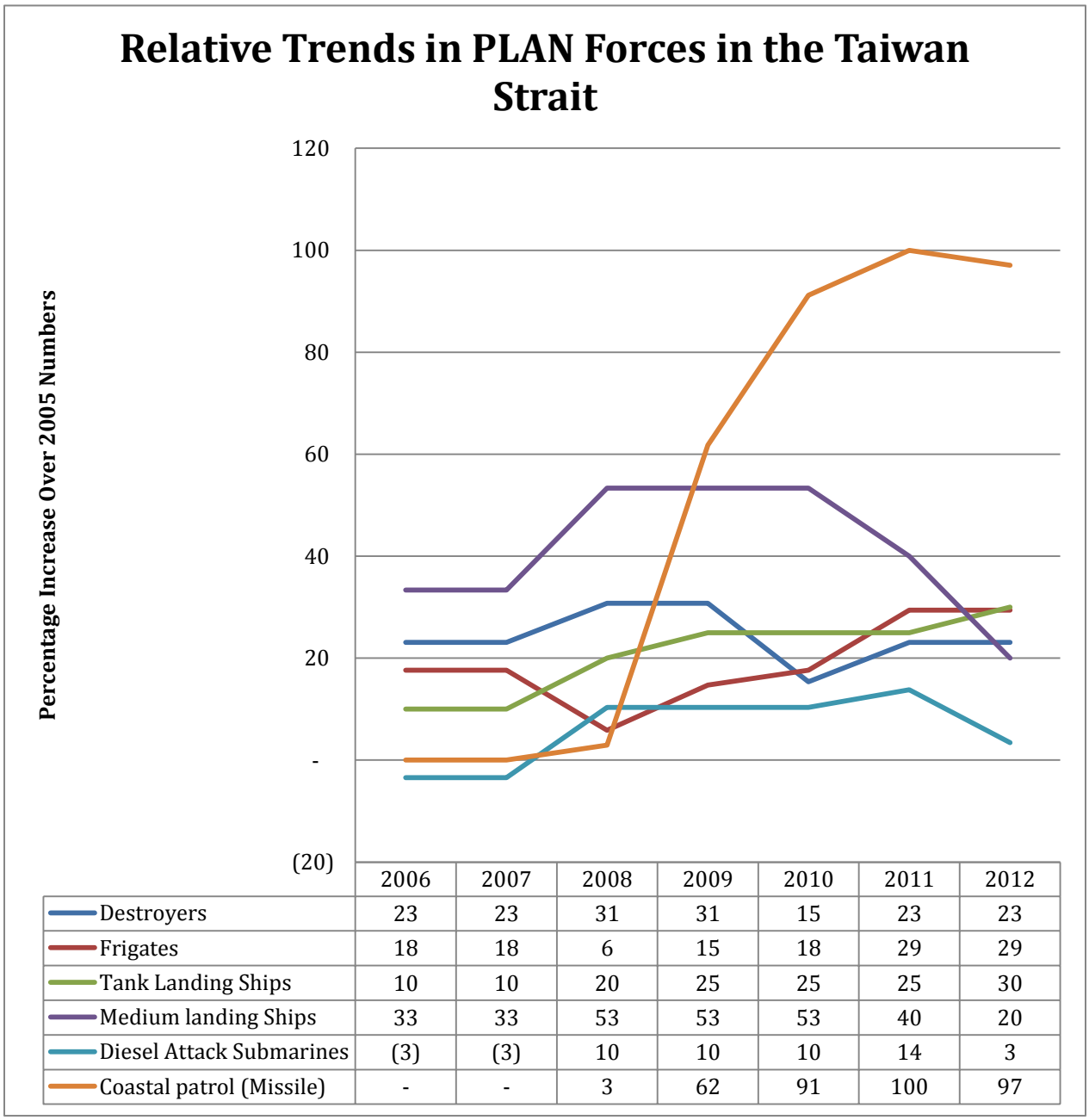
In contrast, the ROC's naval forces have experienced stagnant growth in the naval force structure, with the 30% decrease in destroyers being especially significant. While the ROC has relatively augmented its holdings of patrol craft, the ~20% increase in patrol craft has only been answered by a 5% increase in frigates and stagnant growth in other ship categories.

As a result, the Taiwan Strait naval balance is shifting in the favor of the PRC. Of course, this trend does not mean that the ROC cannot or will not engage in creative and asymmetric means of maintaining cross-strait deterrence in order to compensate for adversary trends in the Strait. However, what these trends indicate is that such asymmetric approaches are becoming necessary for the ROC: symmetric deterrence and war-fighting is becoming less and less feasible for the Taiwan's armed forces.

It is necessary to reiterate that these trends do not account for the myriad factors that will influence a PRC-ROC naval contest. Both sides operate numerous systems and forces not shown in the quantitative data below that will influence the naval contest. However, numbers do play a role in determining the outcome of combat.

Figure 9.6 demonstrates the changing relative force strength of PLAN deployments to the Taiwan Strait while Figure 9.7 shows the changing relative force strength of ROC naval deployments.

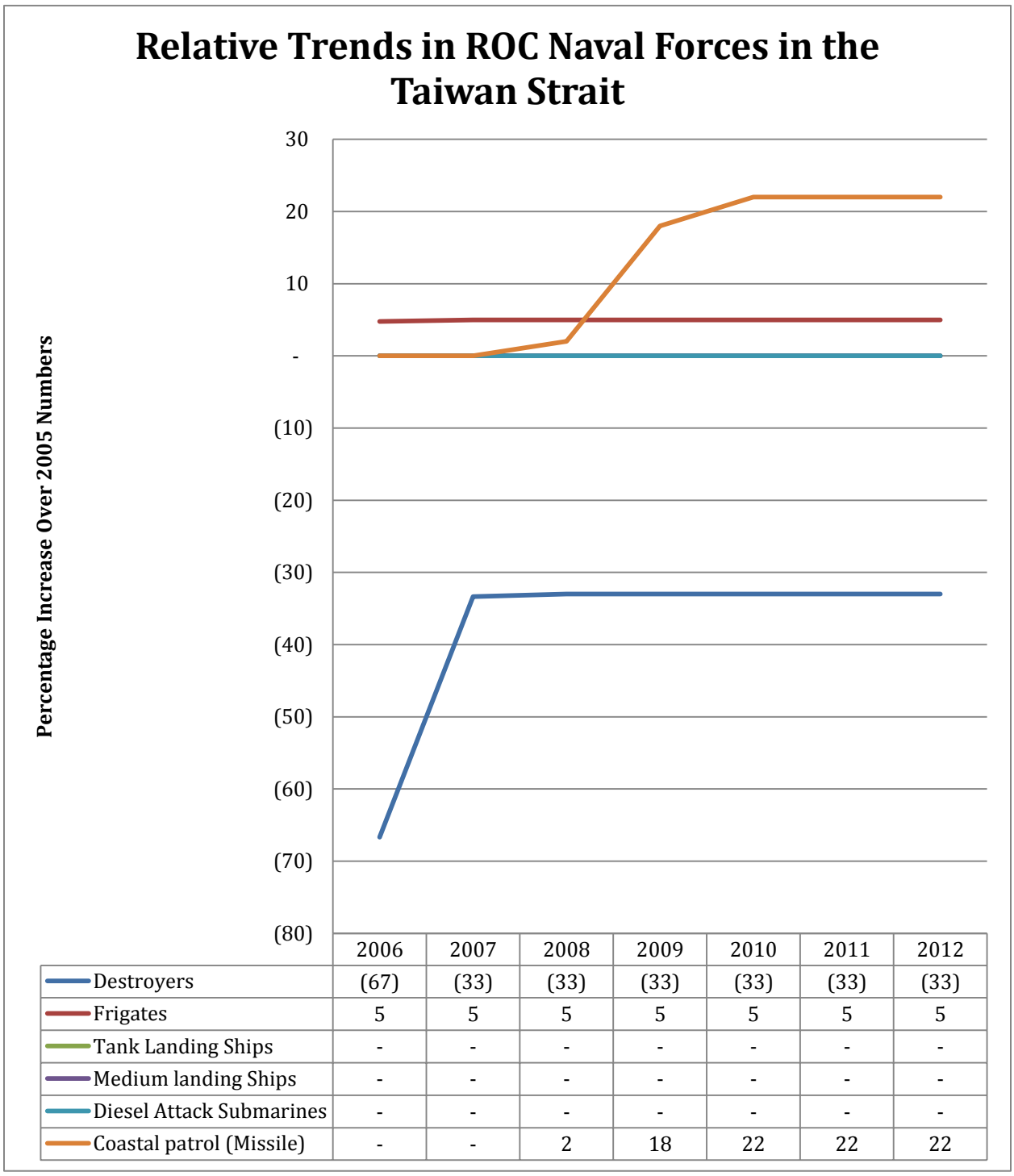
Figure 9.6: Relative Trends in PLAN Deployments to the East and South Sea Fleets



	2006	2007	2008	2009	2010	2011	2012
Destroyers	23	23	31	31	15	23	23
Frigates	18	18	6	15	18	29	29
Tank Landing Ships	10	10	20	25	25	25	30
Medium landing Ships	33	33	53	53	53	40	20
Diesel Attack Submarines	(3)	(3)	10	10	10	14	3
Coastal patrol (Missile)	-	-	3	62	91	100	97

Source: DOD, *Military Power of the People's Republic of China* 2005-2008; *Military and Security Developments Involving the People's Republic of China* 2009-2012.

Figure 9.7: Relative Trends in ROC Naval Deployments



	2006	2007	2008	2009	2010	2011	2012
Destroyers	(67)	(33)	(33)	(33)	(33)	(33)	(33)
Frigates	5	5	5	5	5	5	5
Tank Landing Ships	-	-	-	-	-	-	-
Medium landing Ships	-	-	-	-	-	-	-
Diesel Attack Submarines	-	-	-	-	-	-	-
Coastal patrol (Missile)	-	-	2	18	22	22	22

Source: DOD, *Military Power of the People's Republic of China* 2005-2008; *Military and Security Developments Involving the People's Republic of China* 2009-2012.

The Aerial Balance

The Taiwan Strait aerial balance is changing in more complex ways than the naval balance. Rather than a clear shift in the favor of one country or another, the numbers of aircraft alone cannot indicate a shift in the military balance. Although the ROC Air Force (ROCAF) has introduced bomber aircraft, as well as reduced its fighter holdings at roughly one third the rate the PLAAF has, the PLAAF reductions coincide with the already discussed introduction of modern aircraft into the PLAAF fleet. Moreover, there exist numerous components of the aerial balance that lie outside a symmetric comparison of aircraft: long-range SAM's, SRBM's, naval forces, and long-range artillery all have the potential to influence potential aerial combat over the Taiwan Strait. Consequently, with the DOD-supplied numbers alone, it is difficult to state definitively whether the military balance is shifting in one direction or another. Such a determination would require change over time in numerous equipment categories, as well as qualitative trends in training, skill, and leadership.

Considering this reality, the aerial balance has a synergistic effect on the sea and land military balances that make up the Taiwan Strait balance. Changes in the aerial balance especially affect the naval balance, and vice versa. The deployment of ASCM-capable fighters and bombers in Taiwan, as well as the relative increase in Taiwanese fighters compared to the PLAAF's holdings may compensate for the shifting trends in the naval balance. Concurrently, the deployment of more DDG's and guided missile frigates (FFG's) with more capable SAM's by the PLAN may also have a significant effect on the aerial balance. Moreover, the air forces involved have missions in addition to air superiority and close air support: the PLAAF transport aircraft near the Strait indicate that tactical and operational airlift is an important mission for the PLAAF's Taiwan Strait forces. Thus, one aspect of the aerial balance could be the PLAAF's ability to land and supply ground forces on Taiwan and the ROCAF's ability to prevent such occurrences.

Most significantly, the DOD reports that PLA Second Artillery Corps has between 1,000 and 1,200 SRBM's deployed opposite Taiwan[205]: these forces are capable of fulfilling a counter-air role, and the 2009 RAND report mentioned previously documents how effectively an SRBM force of such a size and sophistication could significantly impede ROCAF air operations. To quote the RAND report:

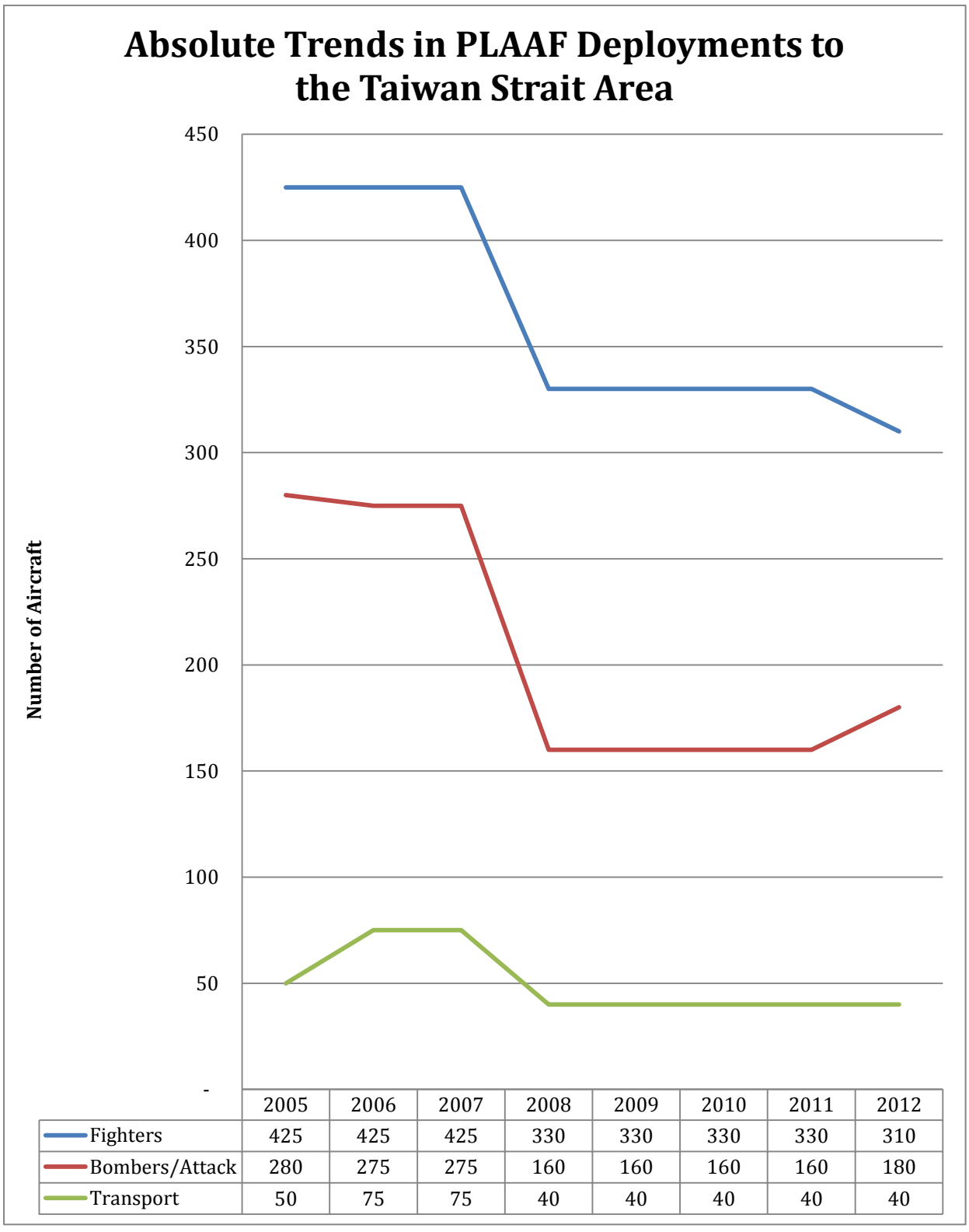
> "…if the entire first wave of missiles is devoted to air base attack, a greater than 90 percent chance of cutting all [ROCAF] runways could be achieved with 40m CEP missiles."[206]

Complementing these SRBM's are PLAA MRL's which have ranges of up to 200km.

With these caveats in mind, Figures 9.8 and 9.9 show the changing absolute trends in the Taiwan Strait aerial balance. The Figures show that both air forces have decreased the absolute number of fighter and transport in the Taiwan Strait. However, the ROCAF's fighter strength has made a significant rebound since 2007. Regarding bomber aircraft, the ROC has made a moderate increase in bomber aircraft from a baseline of zero while the PLAAF made significant reductions in its bomber fleet. However, the PLAAF still holds roughly eight times as many bombers as the ROCAF in the Taiwan Strait area.

Figure 9.8 illustrates the absolute trends in PLAAF deployments to the Taiwan Strait area while Figure 9.9 displays the absolute trends in the ROCAF aircraft inventory.

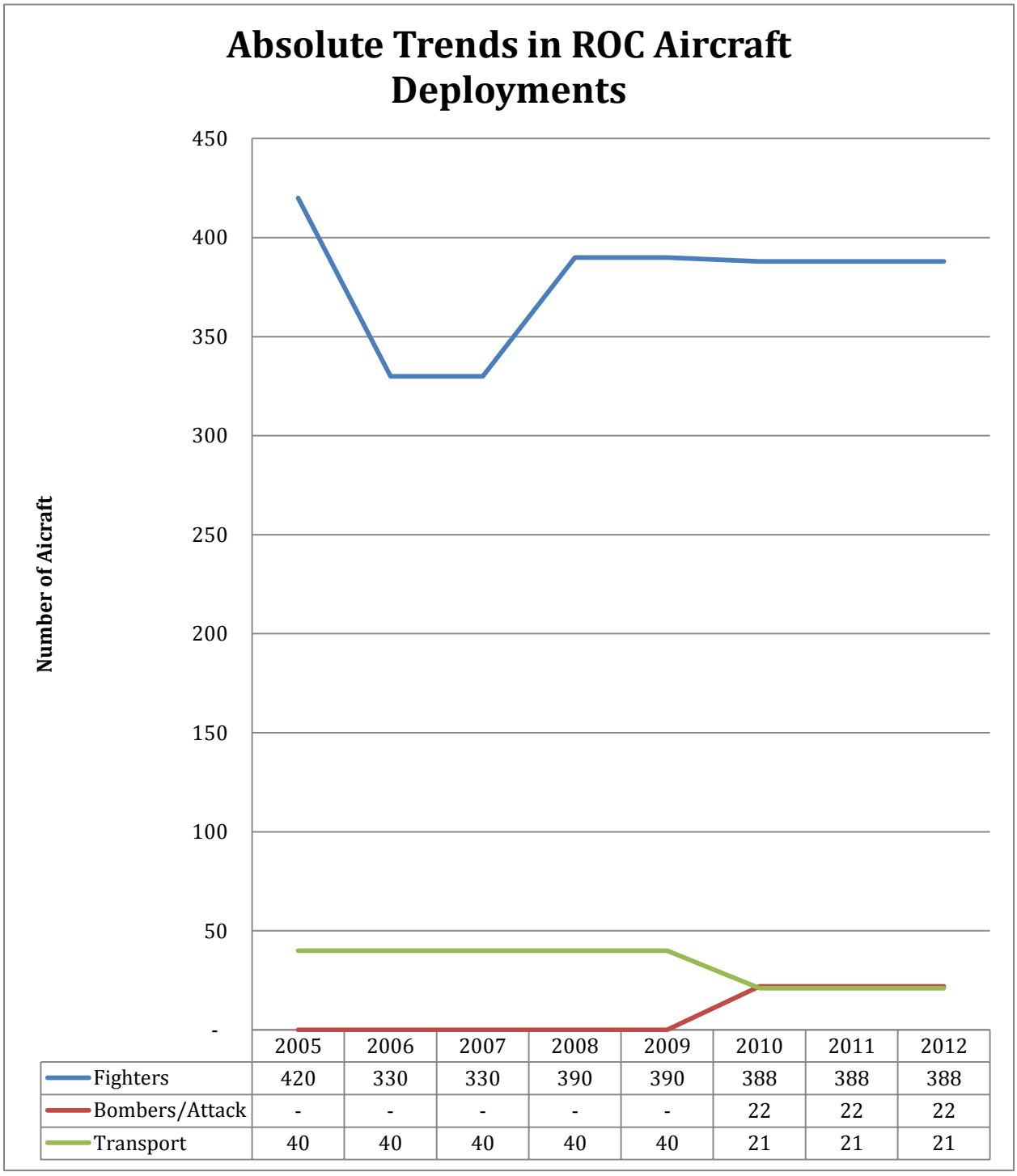
Figure 9.8: Absolute Trends in PLAAF Forces Deployed Near the Taiwan Strait



	2005	2006	2007	2008	2009	2010	2011	2012
Fighters	425	425	425	330	330	330	330	310
Bombers/Attack	280	275	275	160	160	160	160	180
Transport	50	75	75	40	40	40	40	40

Source: DOD, *Military Power of the People's Republic of China* 2005-2008; *Military and Security Developments Involving the People's Republic of China* 2009-2012.

Figure 9.9: Absolute Trends in the ROCAF Aircraft Inventory



	2005	2006	2007	2008	2009	2010	2011	2012
Fighters	420	330	330	390	390	388	388	388
Bombers/Attack	-	-	-	-	-	22	22	22
Transport	40	40	40	40	40	21	21	21

Source: DOD, *Military Power of the People's Republic of China* 2005-2008; *Military and Security Developments Involving the People's Republic of China* 2009-2012.

It is difficult to judge the significance of the absolute numbers provided in Figures 9.8 and 9.9 without also the relative trends that result from these numbers. As stated previously, the ROC armed forces operate on the assumption of numerical inferiority, so it is difficult to determine whether the reductions on both sides actually alter the military balance.

In order to provide context for these numbers, as well as to better enable an estimation of the changes occurring in the Taiwan Strait military balance, Figures 9.10 and 9.11 provide the relative trends in the force numbers of both the PLAAF and ROCAF.

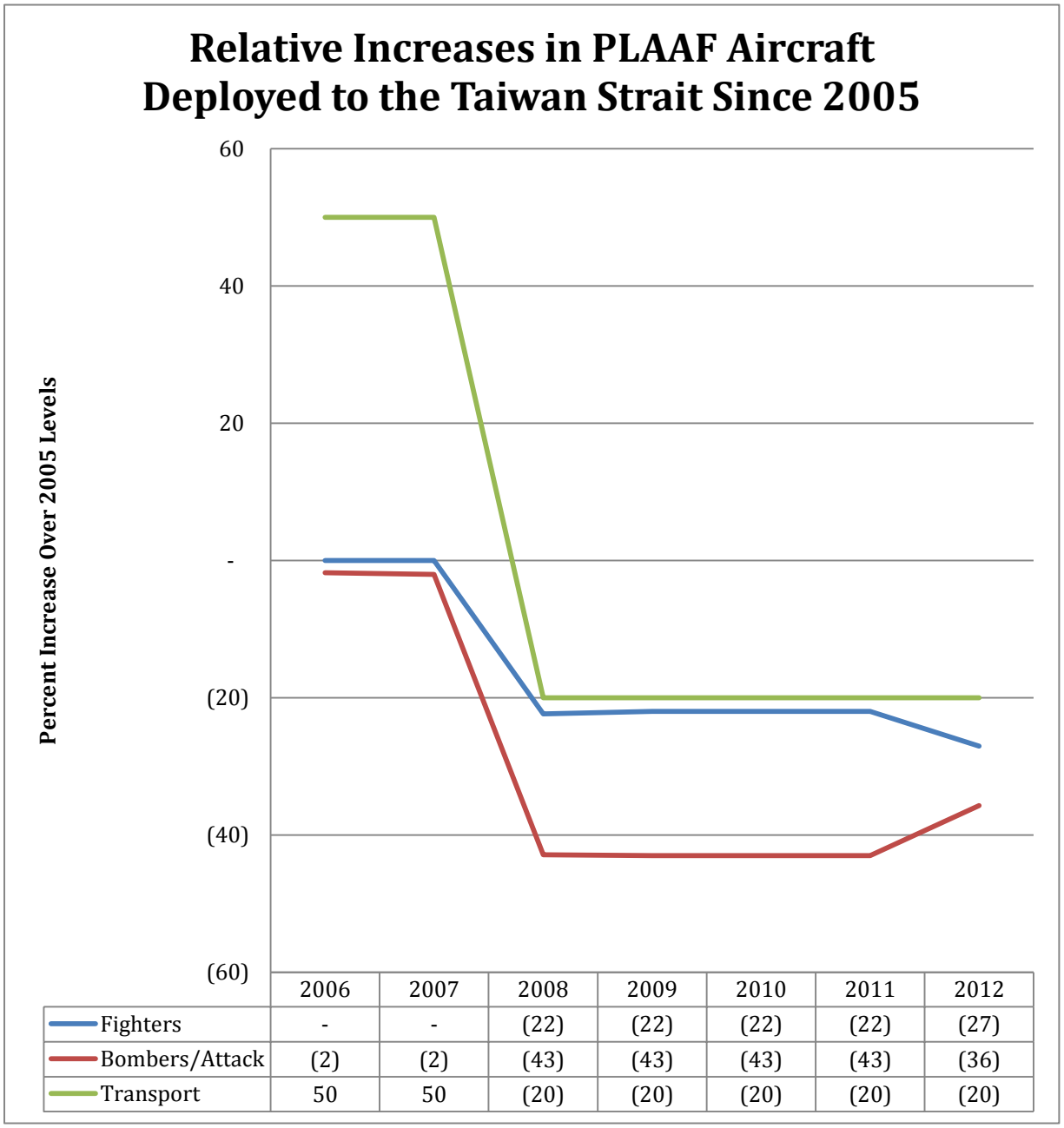
What the Figures indicate is that both air forces have engaged in significant numerical reductions in their respective force strengths. As mentioned earlier, these numbers must be placed in the context of dual modernization programs which augment the capabilities of each individual aircraft on both sides. Consequently, a smaller force may paradoxically be more capable than a larger one.

With that caveat, the relative numbers indicate that the PLAAF has reduced combat aircraft at a relatively higher pace than the ROCAF. Between 2005 and 2012, the ROCAF fighter arm decreased in number at one-third the pace of the PLAAF's fighter strength deployed to the Taiwan Strait area. Moreover, as the ROC's fighter forces have grown in strength since 2008, the 2005-2007 reduction may indicate the culling of obsolete aircraft and their replacement with more advanced systems. In addition, as the ROCAF has introduced bombers while the PLAAF has reduced its bomber holdings, the ROCAF bomber force has increased relative to the PLAAF's bomber force. These relative numbers indicate a shift in the aerial balance in the favor of the ROCAF.

Of course, a comparison of numbers alone only tells part of the story. How the ROCAF's relatively improving fighter and bomber force would perform against improving PLAA and PLAAF long-range SAM's, as well as sea-based PLAN SAM's, is a standing question. Another unanswerable question is whether the ROC's air defense systems would provide the ROCAF a relatively greater advantage than the PLA's air defense systems would provide the PLAAF. Other key contests are between the SAC's SRBM's and the ROC's cruise missile forces, both sides' electronic warfare forces, and both sides' cyberwarfare forces.

With these warnings, the quantitative trends indicate that the ROCAF is gaining ground at the expense of the PLAAF. As far as relative numbers determine the outcome of deterrence and combat, the ROCAF has seen a relative shift in its favor.

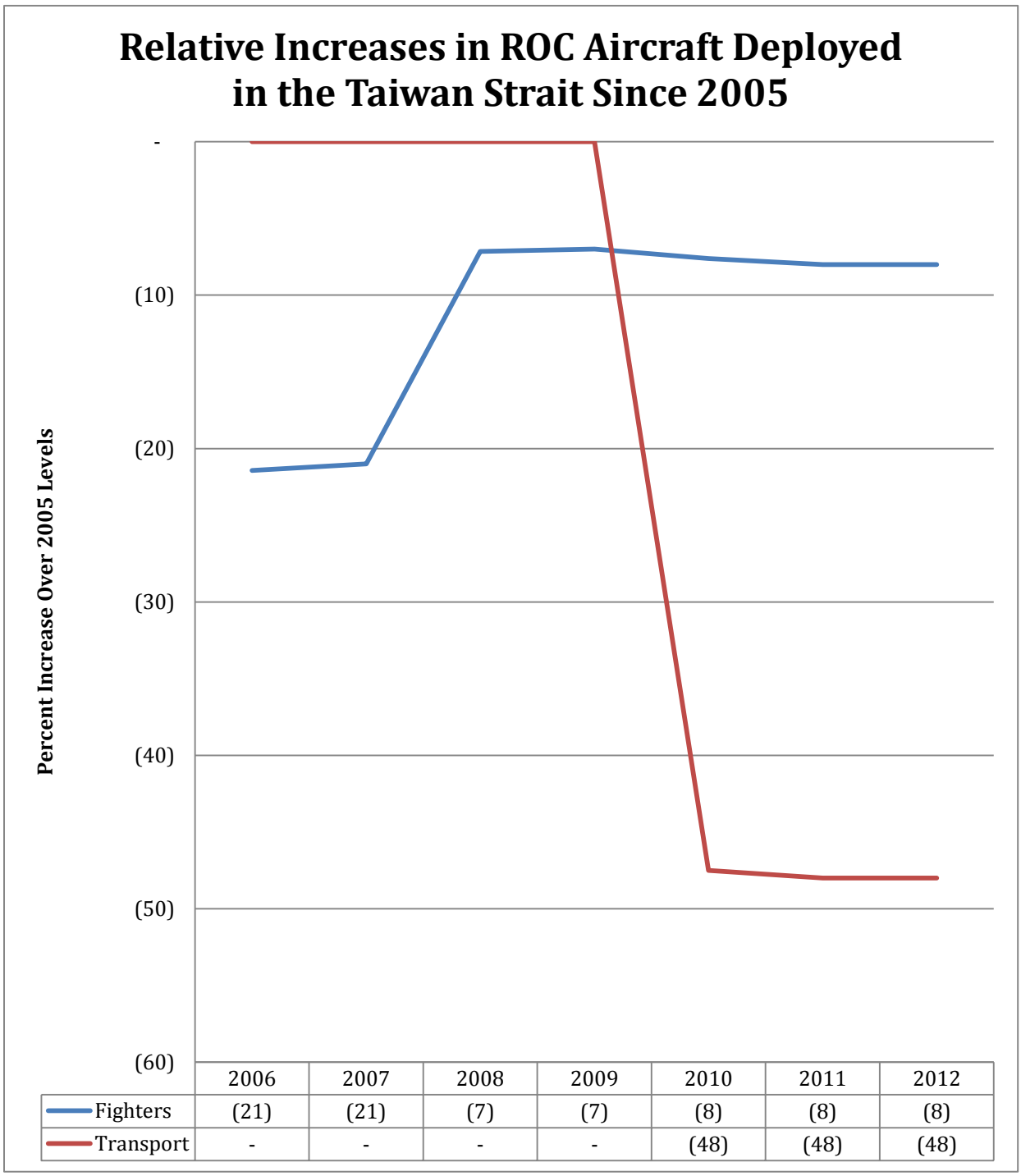
Figure 9.10: Relative Trends in PLAAF Force Numbers



	2006	2007	2008	2009	2010	2011	2012
Fighters	-	-	(22)	(22)	(22)	(22)	(27)
Bombers/Attack	(2)	(2)	(43)	(43)	(43)	(43)	(36)
Transport	50	50	(20)	(20)	(20)	(20)	(20)

Source: DOD, *Military Power of the People's Republic of China* 2005-2008; *Military and Security Developments Involving the People's Republic of China* 2009-2012.

Figure 9.11: Relative Trends in ROCAF Force Numbers



Source: DOD, *Military Power of the People's Republic of China* 2005-2008; *Military and Security Developments Involving the People's Republic of China* 2009-2012.

Note: Bomber forces were not included in relative trends because the bomber force strength increased from 0, making the relative increase infinite. The current bomber force strength is reported by the DOD to be 22.

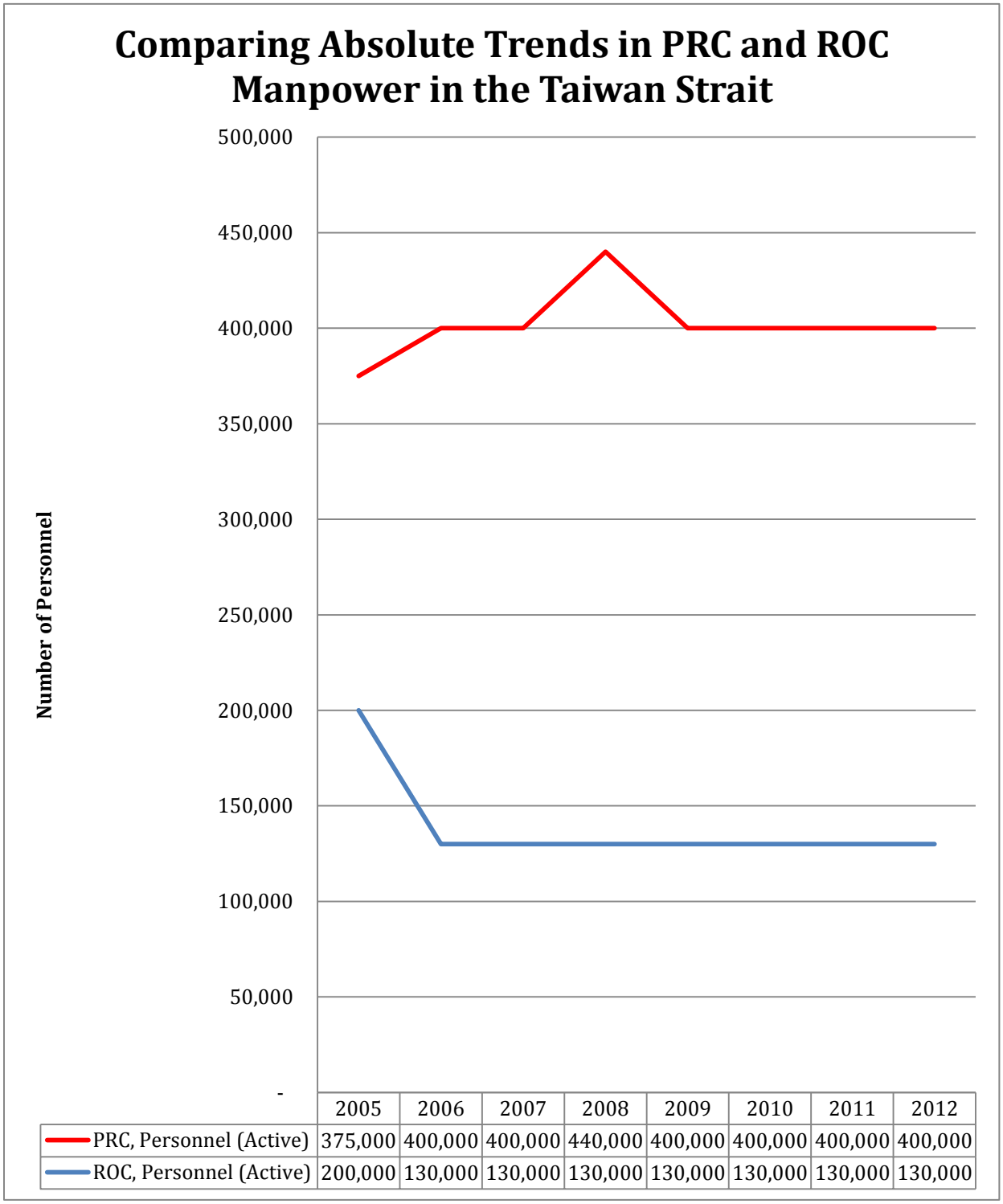
The Ground Force Balance

The ground force balance is the most difficult to extrapolate from force numbers because Taiwan's island geography, as well as the necessity of amphibious operations for either side to conduct large-scale offensive operations, leads to extraordinary asymmetry in land operations. The attacking side must cross 185km of sea in the face of air and sea defenses, forcibly enter terrain in the face of reinforced defenses while vulnerable, establish a beachhead, and continuously supply a very large military force across the ocean despite adversary actions. In this context, the effect of numbers is highly scenario dependent and full numbers can only be brought to bear once the most difficult elements of amphibious operations have already succeeded.

In addition, combat in all other domains will influence the conduct and success of land operations. Furthermore, these effects will be persistent: the necessity of logistics means that an amphibious operation is *always* vulnerable to logistics interdiction in *all* domains regardless of the progress made by land forces on the offensive.

Having listed the significant limitations to comparing land forces in a side by side manner, Figures 9.12 and 9.13 provide comparative data on the manpower and equipment strengths on both sides of the Taiwan Strait. As Figure 9.12 indicates, the PLAA has moderately increased its manpower levels in the Taiwan Strait area while the ROC has decreased the size of its army by over one-third. The ROC's manpower reduction is likely a symptom of its transition to an all-volunteer, more modern force. The PLA is also making similar changes, so an increase in manpower levels indicates that the PLA is increasing the relative resources dedicated to the Taiwan Theater. However, the moderate size of the increase, combined with discrepancies in year-on-year accounting in the DOD's annual reports to congress, mean that the increase may merely represent different DOD accounting practices.

Figure 9.12: A Comparison of Manpower Trends in PLAA and ROC Army in the Taiwan Strait Region

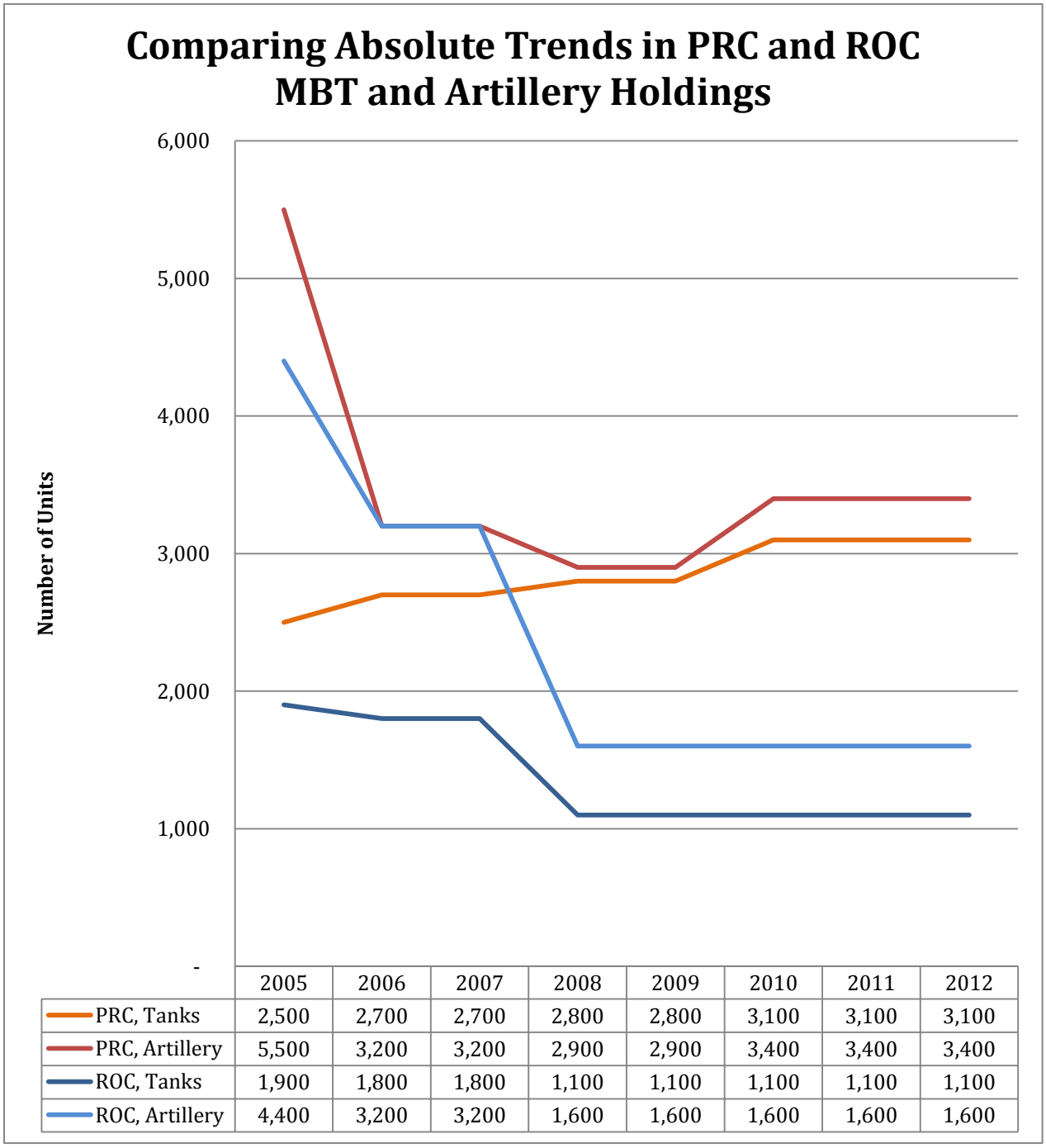


Source: DOD, *Military Power of the People's Republic of China* 2005-2008; *Military and Security Developments Involving the People's Republic of China* 2009-2012.

Figure 9.13 shows the comparative trends in MBT and artillery holdings. As the Figure shows, the ROC has engaged in a significant reduction of both MBT's and artillery systems. The PLAA has also decreased its artillery holdings, but it has also deployed additional tanks to the Taiwan Strait region. These absolute trends indicate that the ground force balance is shifting in the PLAA's favor, as the PLAA has seen a relative increase in manpower and tanks compared to the ROC.

Another important element of the numbers shown below is the PLAA's rebound in artillery forces following a significant 2006 decrease. This may indicate that the PLAA discarded obsolete equipment and replaced it with modern artillery systems: such an action would be consistent with previously described PLA practices during its military modernization. In contrast, however, the ROC's force reductions show no rebounds.

Figure 9.13: A Comparison of Trends in PLAA and ROC Equipment Holdings in the Taiwan Strait Region



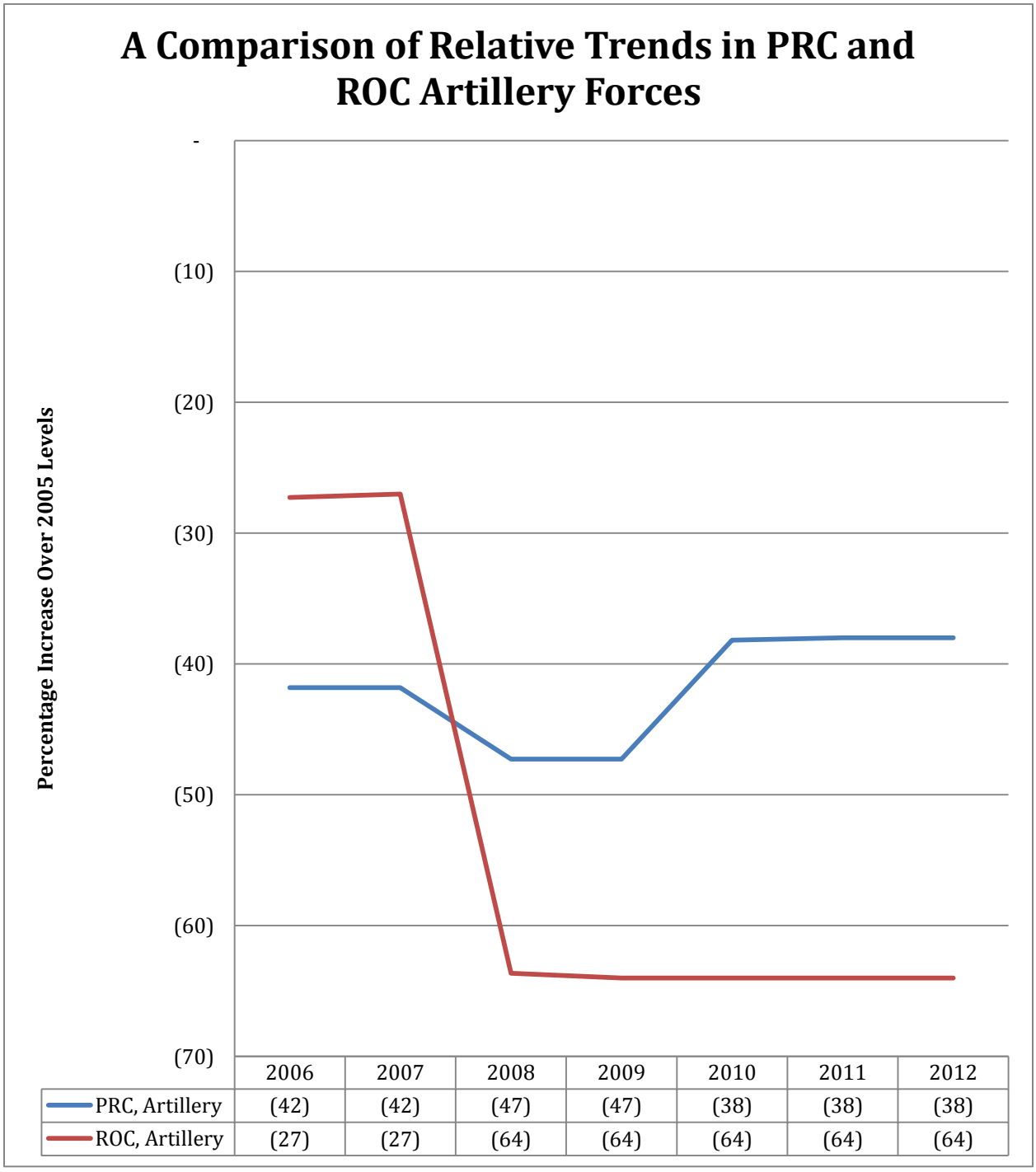
	2005	2006	2007	2008	2009	2010	2011	2012
PRC, Tanks	2,500	2,700	2,700	2,800	2,800	3,100	3,100	3,100
PRC, Artillery	5,500	3,200	3,200	2,900	2,900	3,400	3,400	3,400
ROC, Tanks	1,900	1,800	1,800	1,100	1,100	1,100	1,100	1,100
ROC, Artillery	4,400	3,200	3,200	1,600	1,600	1,600	1,600	1,600

Source: DOD, *Military Power of the People's Republic of China* 2005-2008; *Military and Security Developments Involving the People's Republic of China* 2009-2012.

While the absolute trends in tanks lend themselves to easy comparison, the absolute trends in artillery are more difficult: both forces are decreasing artillery system numbers. Figure 9.14 illustrates the relative trend in artillery force numbers and shows that the balance in artillery forces has shifted in the PLAA's favor: there are more PLAA artillery pieces per ROC artillery piece in 2012 than in 2005.

This trend in the PLAA's favor is only reinforced if the PLAA's rebound in artillery numbers is caused by the introduction of modern artillery pieces: such an action would reinforce the PLAA's relative combat advantage over ROC artillery.

Figure 9.14: A Comparison of Relative Trends in PRC and ROC Artillery Forces



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