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# *China and the U.S.: Cooperation, Competition and/or Conflict*

An Experimental Assessment

## PART FOUR: THE SUPERPOWER BALANCE AND CHINESE GRAND STRATEGY

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Photo: GOH CHAI HIN/AFP/ Getty Images

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# The Military Dimension of China's Grand Strategy

The fact that China's military capabilities are developing more slowly than its economic power does not make its emergence as the world's second-largest military power and less significant. China's military and security expenditures have vastly exceeded those of Russia for at least the last decade. While China still lags the U.S. and Russia in nuclear weapons, and many areas of deployed military technology, it is making rapid progress in virtually every area and already is by far the most dominant Asian military power.

It already has shown it has highly sophisticated capabilities for hybrid politico-military operations, has made major improvements in its conventional forces, greatly improved its military basing and infrastructure, developed a far more sophisticated military industrial base, and begun to deploy MIRV'd ICBMs and more competitive SSBNs.

All of these military activities complement its rise as a global economic power, and it again should be stressed that China's state system allows it to combine its economic and military grand strategy in ways that nation's that depend on private industry and capital investment – like the United States – cannot. What is far less clear, however, is how well the Chinese state can continue past patterns of growth in both China's economy and military forces, and the overall efficiency that the Chinese state can bring to these efforts over time.

As the following sections of this report also show, there are many areas where the direction of China's further military development are unclear. China has set broad goals for its military progress for 2030, 2035, 2040, and 2050, but these are not defined largely in terms of technology, force goals or even broad strategic capabilities. Equally important, they are not coupled to similar goals for the development of China's economy and civil sector.

# **China's Emergence as a Military Superpower**

## **China vs. US and Russia**

# China's Emergence as a Military "Superpower"

There is no easy way to define a military "superpower." The size of a given nation's inventory of nuclear weapons and delivery systems became a major indicator during the Cold War, and the graphics in this section of the report – and those that follow – show China has not yet begun to compete with the U.S. and Russia by this standard. At the same time, it is far from clear that China would gain strategically from going from its current posture of "minimum assured destruction" to the levels of "maximum assured destruction" now reached by the U.S. and Russia.

If one considers the ability to develop and deploy military forces, the summary graphics in this report indicate that Russia has a far smaller economy and ability to fund military forces than China and DIA and IISS estimates indicate that China is spending some three times more than Russia and might be able to equal U.S. spending in directly comparable cost terms by some point between 2030 and 2040. As has been noted earlier, China might also be a peer competitor in even the most advanced aspects of military technology and tactics by this time.

The graphics that follow also show that China already is competitive in many areas of conventional forces and weapons numbers, although it lags in technology and systems capability. This lag, however, is at least partly offset by China's geographic position, the problems that the U.S. and Russia have in projecting power in Asia, and China's ability to combine political and economic pressure and influence with its military power in the Western Pacific, Asia, and increasingly in the Indian Ocean Area.

"A2 D2" alone is a major challenge for the U.S., as are sophisticated hybrid politico-economic-military operations, and warnings about the risks to the U.S. of "land wars in Asia" have considerable validity. As for Russia, such warning may be even more valid. Russia's current strategic capabilities in Asia seem much closer to those of Czarist Russia in 1905 than the capabilities of the USSR in the 1990s.

# China's 2019 Defense White Paper on the Shifting Balance

...As the realignment of international powers accelerates and the strength of emerging markets and developing countries keeps growing, the configuration of strategic power is becoming more balanced. The pursuit of peace, stability and development has become a universal aspiration of the international community with forces for peace predominating over elements of war. However, international security system and order are undermined by growing hegemonism, power politics, unilateralism and constant regional conflicts and wars.

...The US has adjusted its national security and defense strategies, and adopted unilateral policies. It has provoked and intensified competition among major countries, significantly increased its defense expenditure, pushed for additional capacity in nuclear, outer space, cyber and missile defense, and undermined global strategic stability. NATO has continued its enlargement, stepped up military deployment in Central and Eastern Europe, and conducted frequent military exercises. Russia is strengthening its nuclear and non-nuclear capabilities for strategic containment, and striving to safeguard its strategic security space and interests. The European Union (EU) is accelerating its security and defense integration to be more independent in its own security.

...Major countries around the world are readjusting their security and military strategies and military organizational structures. They are developing new types of combat forces to seize the strategic commanding heights in military competition. The US is engaging in technological and institutional innovation in pursuit of absolute military superiority. Russia is advancing its New Look military reform. Meanwhile, the UK, France, Germany, Japan and India are rebalancing and optimizing the structure of their military forces.

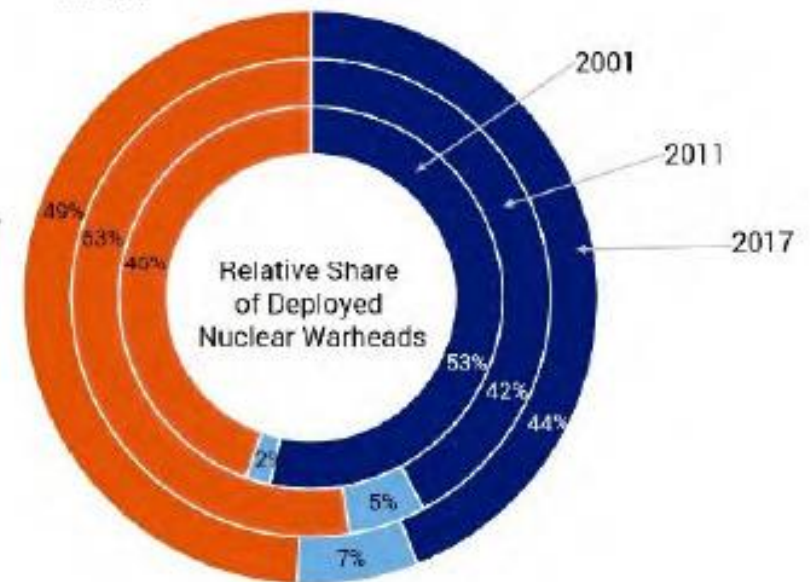
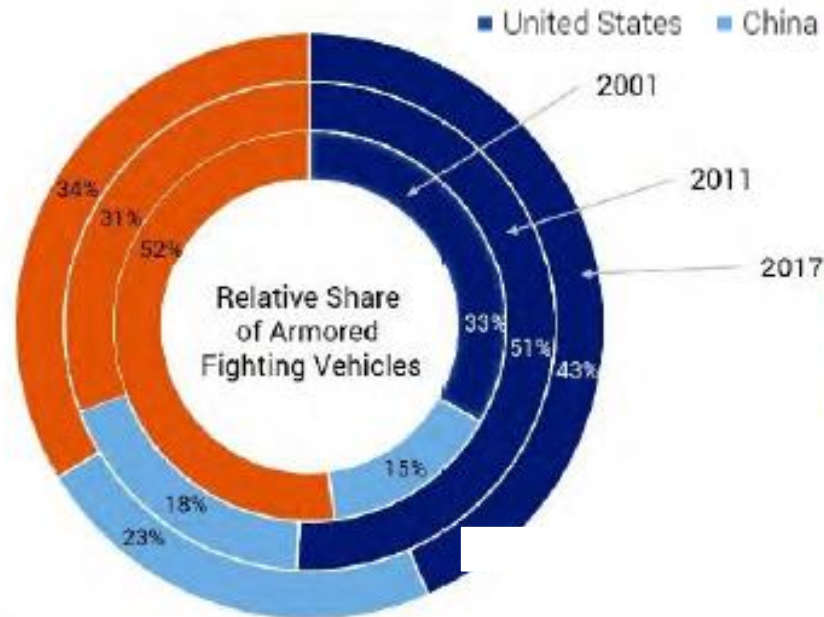
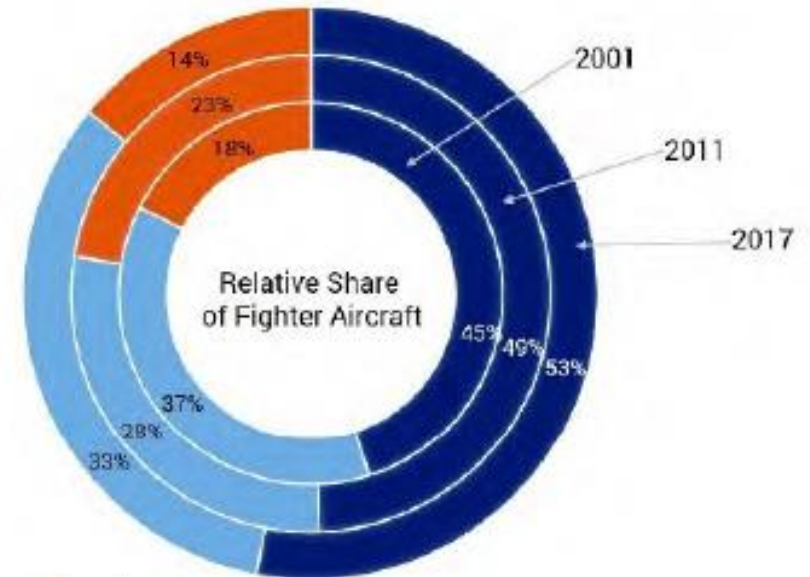
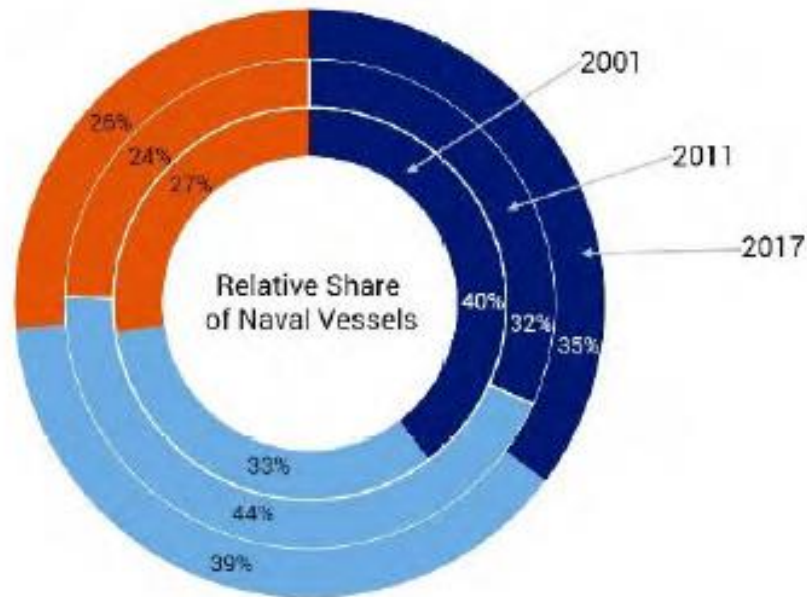
...Great progress has been made in the Revolution in Military Affairs (RMA) with Chinese characteristics. However, the People's Liberation Army (PLA) has yet to complete the task of mechanization, and is in urgent need of improving its informationization. China's military security is confronted by risks from technology surprise and growing technological generation gap. Greater efforts have to be invested in military modernization to meet national security demands. The PLA still lags far behind the world's leading militaries.

The socialist system of China, the strategic decision to follow the path of peaceful development, the independent foreign policy of peace, and the best of cultural traditions – considering peace and harmony as fundamentals – determine that China will pursue a national defense policy that is defensive in nature.

...The development of China's national defense aims to meet its rightful security needs and contribute to the growth of the world's peaceful forces. History proves and will continue to prove that China will never follow the beaten track of big powers in seeking hegemony. No matter how it might develop, China will never threaten any other country or seek any sphere of influence.

...Nuclear capability is the strategic cornerstone to safeguarding national sovereignty and security. China's armed forces strengthen the safety management of nuclear weapons and facilities, maintain the appropriate level of readiness and enhance strategic deterrence capability to protect national strategic security and maintain international strategic stability.

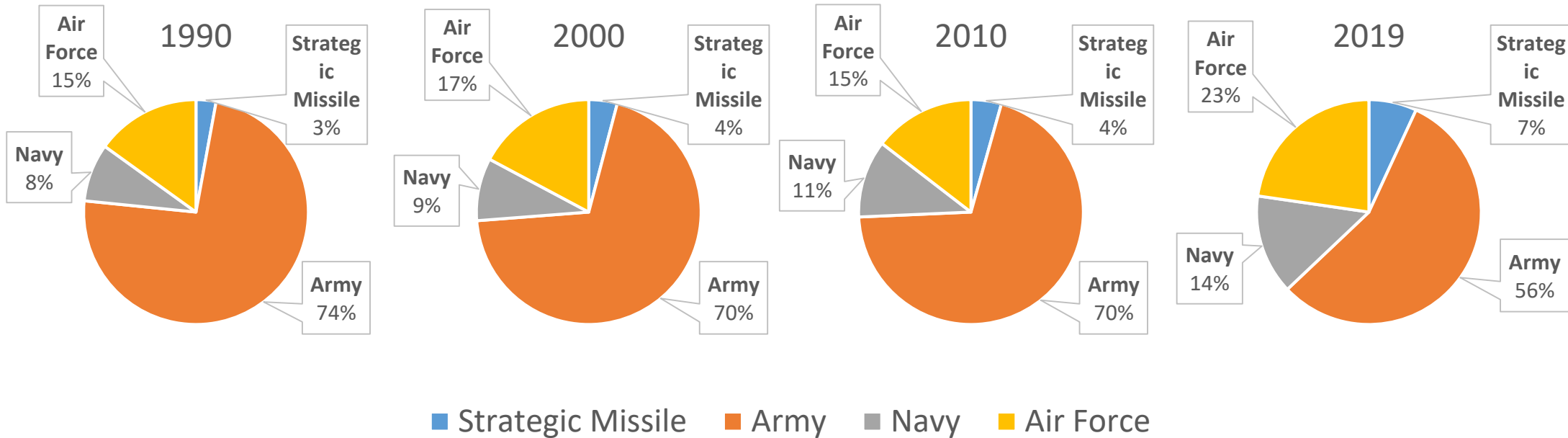
# Total Global Chinese vs. U.S. vs. Russian Military Forces; 2001-2017



Source; International Institute for Strategic Studies (IISS) Military Balance, 2002, 2012, 2018. Bulletin of Atomic Scientists, Nuclear Notebook, Providing for the Common Defense, 2018, p.13.

Notes: Naval vessels include submarines and combat logistics force ships, but exclude small patrol and landing craft. Fighter aircraft exclude "attack aircraft," but include "fighter, ground attack" aircraft, as classified by IISS.

# China's Changing Military Personnel: 1990-2019



Category	Total	Strategic Missile	% of Total	Army	% of Total	Navy	% of Total	Air Force	% of Total	Paramilitary
1980	4,450,000	ND	ND	3,600,000	(80.9%)	360,000	(8.1%)	490,000	(11.0%)	ND
1990	3,030,000	90,000	(3.0%)	2,300,000	(75.9%)	260,000	(8.6%)	470,000	(15.5%)	12,000,000
2000	2,470,000	100,000	(4.0%)	1,700,000	(68.8%)	220,000	(8.9%)	420,000	(17.0%)	1,000,000
2010	2,285,000	100,000	(4.4%)	1,600,000	(70.0%)	255,000	(11.2%)	333,000	(14.6%)	660,000
2019	2,035,000	120,000	(5.9%)	975,000	(47.9%)	250,000	(12.3%)	395,000	(19.4%)	660,000

Source: World Bank, <https://data.worldbank.org/indicator/MS.MIL.TOTL.P1?end=2017&locations=CN&start=1985&view=chart>, and IISS, Military Balance.

# Total Global Chinese vs. U.S. vs. Russian Conventional Combat Forces in 2018 - I

	U.S.	Russia	China
<b>Total Military Personnel</b>			
Active	1,348,400	900,000	2,035,000
Reserve	857,950	2,000,000	510,000
<b>Army*</b>			
Active Personnel	476,250	283,000?	1,300,000?
Reserve Personnel	537,000	?	?
Main Battle Tanks	2,384	2,840	6,740
Armored Fighting Vehicles	4,713	6,860	4,450
Armored Personnel Carriers	10,746	6,876+	5,020+
Total Artillery	5,395	4,928+	13,218+
Self-Propelled	947	1,770	2,320
Towed	1,339	400	6,440
Multiple Rocket Launcher	600	862	1,872+
Mortar	2,507	1,790+	2,586
SRBM-Short Range Ballistic Missiles	168	144	?
Cruise Missiles	?	?	?
Attack/Assault Helicopters	603	376+ (AF)	240
<b>Marines</b>			
Active	184,400	35,000?	15,000
Reserve	38,700	?	?
Main Battle Tanks	447	250	-
Armored Fighting Vehicles	502-1,702	1,000	163
Armored Personnel Carriers	N/A	400	-
Total Artillery	1,501	365	40+
Self-Propelled	N/A	163	40+
Towed	812	166	-
Multiple Rocket Launcher	40	36	?
Mortar	649	?	?
SRBM- Short Range Ballistic Missiles	-	11	-

\* Army includes Russian Special Forces, and Chinese Airborne Corps, Strategic Support Force, and "Other"

Source is IISS, Military Balance 2018.



# Total Global Chinese vs. U.S. vs. Russian Conventional Combat Forces in 2018 - II

	U.S.	Russia	China
<b>Navy (Reserve Combat Aircraft in Parenthesis)</b>			
Active Personnel	323,950	150,000	240,000
Reserve Personnel	100,550	?	?
Submarines	68	62	62
Strategic SSBN	14	13	4-5
Tactical SSGN	47	9	-
Tactical SSN	7	17	9
Tactical SSK	-	23	48
Carrier	11	1	1
Cruiser			
Missile	23	5	-
Destroyer			
Missile	64	15	2
Frigates			
Missile	9	13	59
Corvettes - Missile	-	48	37
Patrol, Coastal Combatants	57	52	206e
Missile	10	21	91
Other	47	31	78
Mine Warfare	11	43	42
Amphibious			
Major (LHA, LHD)	9	-	-
Major (LPD, LSD)	22	-	4
Landing Ship Medium (LSM), Tank (LST)	-	19	53
Landing Craft	245	28	87
Logistic-Support	14	265	186

Source is IISS, Military Balance 2018.

# Total Global Chinese vs. U.S. vs. Russian Conventional Combat Forces in 2018 - III

	U.S.	Russia	China
<b>Air Force*</b>			
Active Personnel	322,800	215,000	395,000
Reserve Personnel	174,450	?	?
Bombers	139 (18)	139	162
Fighters	265 (157)	222	819
Fighter-Ground Attack	903 (407)	378	566
Attack	-	265	240
Anti-Tank	141 (141)	-	-
Electronic Warfare	14	3	13
Intelligence, Surveillance & Reconnaissance (IS&R)	41 (26)	87	-
ELINT-Electronic Intelligence	22 (11)	32	4
AEW&C-Airborne Early Warning and Command/Control	31	28	10
Electronic Warfare Helicopters	-	3	-
<b>Anti-Ballistic Missiles/Surface to Air Missile Launchers (All services)</b>			
ABMs	44	68	-
SAMs			
Long Range	480	724e	192
Medium Range	-	440e	414
Short Range	-	132+	338
<b>Naval Aviation</b>			
Bomber	-	-	27
Fighter	(31)	67	24
Fighter-Ground Attack/Attack	736 (29)	89	259
ASW-Anti Submarine Warfare	120 (12)	44	7
Maritime Patrol	-	5	-
EW-Electronic Warfare	131 (5)	-	-
AEW & Control	80	-	17
Intelligence, Surveillance & Reconnaissance (IS&R)	41 (26)	12	-
ELINT-Electronic Intelligence	-	4	7
ASW-Anti Submarine Warfare Helicopters	225 (7)	83	28
MCM Mine Countermeasure Helicopters	28 (7)	-	-
AEW/EW Helicopters	-	10	10
<b>Marine Aviation</b>			
Fixed Wing Fighter-Ground Attack	437	-	-
Attack/Assault Helicopters	153	-	-

\* U.S. Air Force reserve aircraft in parenthesis. Includes Aerospace for Russia, and People's Liberation Rocket Force for China

Source: International Institute of Strategic Studies, *Military Balance 2018*

# China's Evolving Precision Strike Capability

**Short-Range Ballistic Missiles (300-1,000 km).** The PLA Rocket Force has approximately 1,200 SRBMs. The force fields advanced variants with improved ranges and accuracy in addition to more sophisticated payloads, while gradually replacing earlier generations that do not possess true precision strike capability.

**Medium-Range Ballistic Missiles (1,000-3,000 km).** The PLA is fielding approximately 200-300 conventional MRBMs to increase the range at which it can conduct precision strikes against land targets and naval ships operating far from China's shores out to the first island chain.

**Intermediate-Range Ballistic Missiles (3,000-5,500 km).** The PLA is developing a nuclear and conventional road-mobile IRBM, which increases its capability for near-precision strike as far as the "second island chain." The PLAN also is improving its over-the-horizon (OTH) targeting capability with sky wave and surface wave OTH radars, which can be used in conjunction with reconnaissance satellites to locate targets at great distances from China, thereby supporting long-range precision strikes, including employment of ASBMs.

**Land-Attack Cruise Missiles.** The PLA continues to field approximately 200-300 air- and ground-launched LACMs for standoff precision strikes. Air-launched cruise missiles include the YJ-63, KD-88, and the CJ-20 (the air-launched version of the CJ-10 GLCM). China recently adapted the KD-88 LACM, which has an advertised range of more than 100 km, and may be testing a longer-range version. China also is developing the CM-802AKG LACM, an export system that can strike both land and ship targets from fighters or bombers.

**Ground-Attack Munitions.** The PLAAF has a small number of tactical air-to-surface missiles (ASM) as well as precision-guided munitions including all-weather, satellite-guided bombs, anti-radiation missiles, and laser-guided bombs. China is developing smaller-sized ASMs such as the AR-1, HJ-10 anti-tank, Blue Arrow 7 laser-guided, and KD-2 missiles in conjunction with its increasing development of UAVs. China is also adapting to UAV Global Positioning System-guided munitions such as the FT-5 and LS-6 that are similar to the U.S. Joint Direct Attack Munitions (JDAM).

**Anti-Ship Cruise Missiles.** China deploys a wide range of advanced ASCMs with the YJ-83 series as the most numerous, which are deployed on the majority of China's ships as well as multiple aircraft. China has also outfitted several ships with YJ-62 ASCMs and claims that the new LUYANG III class DDG and future Type 055 CG will be outfitted with a vertically launched variant of the YJ-18 ASCM. The YJ-18 is a long-range torpedo-tube-launched ASCM capable of supersonic terminal sprint which has likely replaced the older YJ-82 on SONG, YUAN, and SHANG class submarines. China has also developed the long range supersonic YJ-12 ASCM for the H-6 bomber. At China's military parade in September 2015, China displayed a ship-to-ship variant of the YJ-12 called the YJ-12A. China also carries the Russian SS-N-22 SUNBURN on four Russian built SOVREMENNY-class DDGs and the Russian SS-N-27b SIZZLER on eight Russian built KILO-class submarines.

**Anti-Radiation Weapons.** China is starting to integrate an indigenous version of the Russian Kh-31P (AS-17), known as the YJ-91, into its fighter-bomber force. The PLA imported Israeli-made HARPY UAVs and Russian-made anti-radiation missiles during the 1990s.

**Artillery-Delivered High Precision Munitions.** The PLA is developing and deploying artillery systems with the range to strike targets within or even across the Taiwan Strait, including the PHL-03 300 mm multiple-rocket launcher (MRL) (greater than 100 km range) and the longer-range AR-3 dual-caliber MRL (out to 220 km range).



# Chinese vs. U.S. vs. Russian Nuclear Delivery Systems in 2018

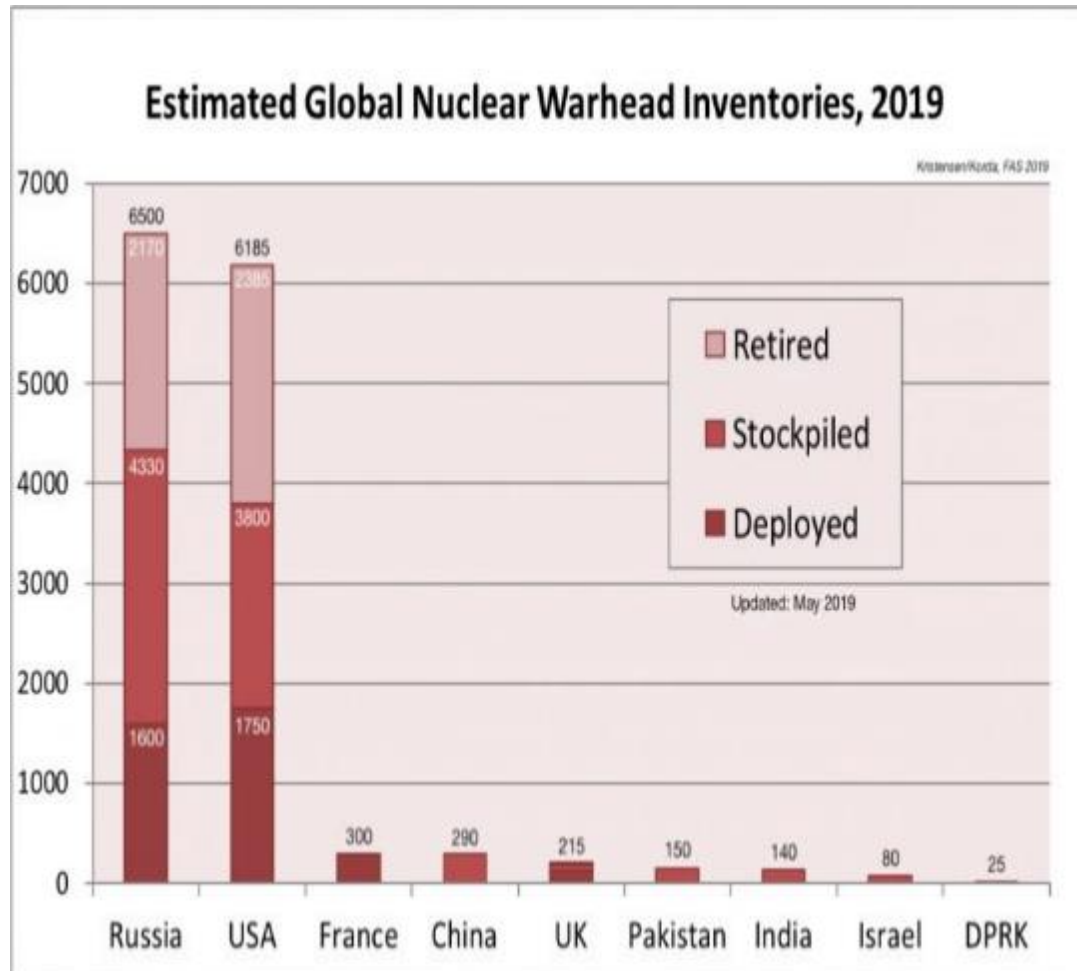
	U.S.	Russia	China
<b>IISS Estimate of Strategic Delivery Systems</b>			
ICBMs	400	313	70
SSBNs (Ships/Maximum Missiles)	14/336	13/192-212	4/48
Bombers	157	129	162

## **U.S. State Department Estimate of START forces (September 1, 2018) versus Chinese Forces**

Deployed ICBMs, Deployed SLBMs, and Deployed Heavy Bombers	659	577	N/A
Warheads on Deployed ICBMs, on Deployed SLBMs, and Nuclear Warheads Counted for Deployed Heavy Bombers	1,358	1,420	N/A
Deployed and Non-deployed Launchers of ICBMs, Deployed and Non-deployed Launchers of SLBMs, and Deployed and Non-deployed Heavy Bombers	800	775	N/A

U.S. State Department, Bureau of Arms Control, Verification, and Compliance, *New START Treaty Aggregate Numbers of Strategic Offensive Arms*, Fact Sheet, September 1, 2018; IISS, *Military Balance 2018*, p. 22

# Chinese vs. U.S. vs. Russian Nuclear Weapons in 2019



**Status of World Nuclear Forces 2019\***

Country	Deployed Strategic	Deployed Nonstrategic	Reserve/ Nondeployed	Military Stockpile <sup>a</sup>	Total Inventory <sup>b</sup>
Russia	1,600 <sup>c</sup>	0 <sup>d</sup>	2,730 <sup>e</sup>	4,330	6,500 <sup>f</sup>
United States	1,600 <sup>g</sup>	150 <sup>h</sup>	2,050 <sup>i</sup>	3,800 <sup>j</sup>	6,185 <sup>k</sup>
France	280 <sup>l</sup>	n.a.	20 <sup>l</sup>	300	300
China	0 <sup>m</sup>	?	290	290	290 <sup>m</sup>
United Kingdom	120 <sup>n</sup>	n.a.	95	215	215 <sup>n</sup>
Israel	0	n.a.	80	80	80 <sup>o</sup>
Pakistan	0	n.a.	140-150	140-150	140-150 <sup>p</sup>
India	0	n.a.	130-140	130-140	130-140 <sup>q</sup>
North Korea	0	n.a.	?	20-30	20-30 <sup>r</sup>
<b>Total:<sup>s</sup></b>	<b>~3,600</b>	<b>~150</b>	<b>~5,555</b>	<b>~9,330</b>	<b>~13,890</b>

Source: Has M. Kristensen and Mat Korda, *Status of World Nuclear Forces*, Federation of American Scientists, 2019

# China vs. U.S. vs. Russia Nuclear Modernization Since 2010



Figure 1. Nuclear Delivery Systems Since 2010  
Data provided by the DoD



# **The Chinese versus Western Views of China's Rising – and Steadily More Competitive – Military Budgets**

# China's Rising – and Steadily More Competitive – Military Budgets

The Chinese estimates of China's spending at the start of this section are taken from China's 2019 Defense White Paper. They are little more than a propaganda exercise. They are carefully manipulated to use official Chinese data that omit large portions of China's actual military budgets, and then compare the resulting low percentages of defense spending relative to GDP and total government spending in ways which make the actual level of effort impossible to compare and that grossly understate the Chinese effort. They are interesting, however, as an example of the way a state can manipulate any public understanding of its military development.

The U.S., IISS, SIPRI and other Western graphics on Chinese military spending compare it with the spending of the US, Russia, and other states – are far more transparent and more accurate, but they still have many of the serious uncertainties that affect the previous comparisons of the Chinese economy with that of other countries. The same problems apply to comparing military spending that apply to comparing GDPs, and to accurately estimate PPP economics versus market prices. Countries may again manipulate public reporting for their own political ends. There also is no way to make precise comparisons that adjust for differences in costs between countries with radically different economic structures, for the different ways that capitalist and state command economies can allocate resources and cost, differences in technology base, reliance on conscription versus professional forces, and a host of other factors.

The graphics that follow reflect all of its differences, but they also agree in enough ways to reflect broad trends that almost certainly are valid. China has made massive increases in its military spending. It has long outpaced Russia and it is become more competitive with the U.S. – particularly if China is manipulating its state-controlled economy and military personnel systems to charge much lower comparative costs.

As the following charts show, however, various think tanks and intelligence estimates of Chinese spending are radically different, and the last chart shows there is no credible current way to estimate how soon – if ever – China would come to equal or surpass the U.S. in military and national security spending. The IISS, for example, reports China's military budget for 2018 as \$168.2 billion in current dollars – quoting its official budget. SIPRI attempts to estimate its budget in terms of comparable buying power relative to a market economy and comes up with an estimate of \$250 billion – an estimate 49% higher. Yet, both estimates may be correct within the definition each think tank uses.

It is also striking that these differences interact in terms of relative military effort with an IISS estimate for Russia in 2018 of \$63.1 billion and a SIPRI estimate of \$61.4 billion, and an IISS estimate of \$643.3 billion for the U.S. with a SIPRI estimate of \$649.0 billion. The U.S. government, however, estimates that the total cost of the U.S. defense budget – less major expenses on Veteran's retirement and services – is \$730.1 billion. This total is 13% higher than the IISS estimate and 12% higher than the SIPRI estimate.

These differences illustrate the major uncertainties in the final chart in this section — *China versus U.S.: Convergence in Military Spending — IISS vs. OSD Guesstimate* — which provides a sample of an effort to project the timelines at which China's military spending might overtake that of the U.S. These projections raise interesting possibilities, but the "facts" behind the estimates are so uncertain in simple monetary terms – and some much more uncertain in terms of truly comparable buy power – that any such estimate is so nominal as to be largely useless as a prediction of the future.

# China's 2019 Defense White Paper on Chinese Military Spending - I

China attends to both development and security. It is making an integrated effort to build a prosperous country and a strong military, and striving for the coordinated development of national defense and the economy. Following the principle of building the armed forces through diligence and thrift, China takes into consideration the development of the economy and the demands of national defense, decides on the appropriate scale and composition of defense expenditure, and manages and applies these funds in accordance with law.

Since reform and opening-up, China has increased its defense expenditure from a level of sustainability to moderate growth. On the whole, defense expenditure has grown in tandem with the growth of the national economy and government expenditure. Defense expenditure as a percentage of GDP has fallen from a peak of 5.43% in 1979 to 1.26% in 2017. It has remained below 2% for the past three decades. Defense expenditure as a percentage of government expenditure was 17.37% in 1979 and 5.14% in 2017, a drop of more than 12 percentage points. The figures are on a clear downward trend.

Figure 3 China's Defense Expenditure as a Percentage of Its GDP (1979-2017) (%)

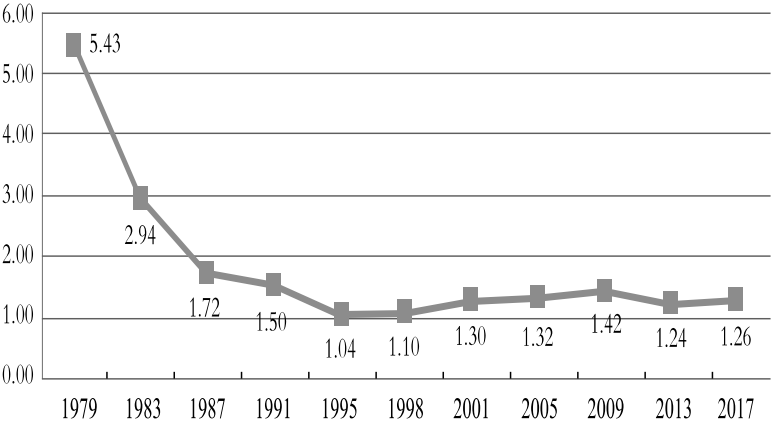
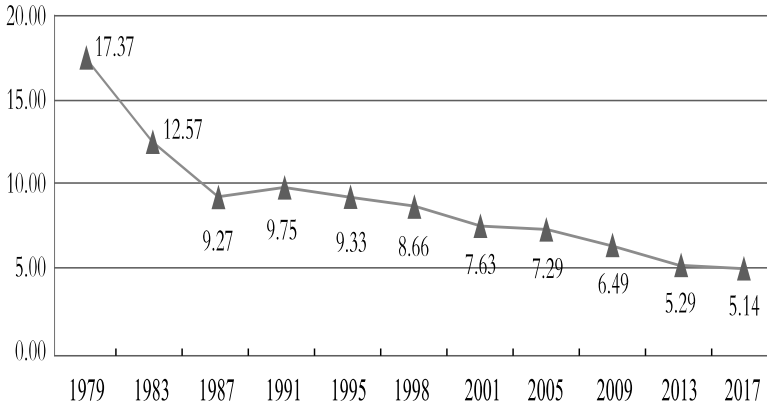


Figure 4 China's Defense Expenditure as a Percentage of Its Government Expenditure (1979-2017) (%)



## China's Defense Expenditure Since 2012

In the new era, to keep pace with the country's modernization, China is focusing on building a fortified national defense and a strong military commensurate with the country's international standing, and its national security and development interests. China is striving to narrow the gap between its military and the world's leading militaries, and make up the deficiencies in the military's capabilities in modern warfare. Defense expenditure is growing steadily and the breakdown of spending is being continuously optimized.



# China's 2019 Defense White Paper on Chinese Military Spending - II

In terms of usage, China's defense expenditure is assigned to three sectors – personnel, training and sustainment, and equipment. Personnel expenses mainly cover the salaries, allowances, food, bedding, clothing, insurance, subsidies and pensions for officers, non-ranking officers, soldiers and contracted civilians, as well as retirees supported from the defense budget. Training and sustainment expenses mainly cover training of the troops, institutional education, construction and maintenance of installations and facilities, and other expenditure on routine consumables. Equipment expenses mainly cover R&D, testing, procurement, repairs, maintenance, transport and the storage of weaponry and equipment. In terms of scope, defense expenditure covers all active forces, reserve forces and militia.

Since 2012, the increase in defense expenditure has been primarily spent for the following purposes:

1. Adapting to national economic and social development, improving the wellbeing of service personnel, ensuring regular increases in military salaries, and bettering the working, training and living conditions of the troops;
2. Increasing input in weaponry and equipment development, phasing out the outdated, upgrading the old, and developing and procuring the new, such as aircraft carriers, fighters, missiles and main battle tanks, to steadily modernize weaponry and equipment;
3. Deepening national defense and military reform, supporting major reforms in military leadership and command systems, force structure and composition, and policies and institutions;
4. Supporting training in real combat conditions, enhancing strategic-level training, joint training at TCs' level and training of services and arms, and improving the conditions for simulated, networked and force-on-force training; and
5. Supporting diverse military tasks including the UNPKOs, vessel protection operations, humanitarian assistance operations and disaster relief efforts.

From 2012 to 2017, China's defense expenditure increased from RMB669.192 billion to RMB1,043.237 billion. China's GDP and government expenditure grew at average rates of 9.04% and 10.43% respectively, calculated on the price of the indicated years, while its defense expenditure increased by an average of 9.42%. Defense expenditure accounted for 1.28% of GDP and 5.26% of government expenditure on average. The percentage of China's defense expenditure in GDP remained stable and grew in coordination with the increase of government expenditure.

China applies strict mechanisms of fiscal allocation and budget management on its defense expenditure. It pursues a level of defense spending that is demand-oriented, planning-led and consistent with its capacity. It endeavors to strengthen unified management, coordinate existing and incremental expenditure, gradually practice cost-effectiveness management, and steadily press ahead with reform that is centered on efficacy and efficiency. To improve and strengthen budget management, China's armed forces are extending reform of the centralized collection and payment of military funds, accelerating standardization in relation to defense expenditure, and improving the management of assets and funds.

# China's 2019 Defense White Paper on Chinese Military Spending - III

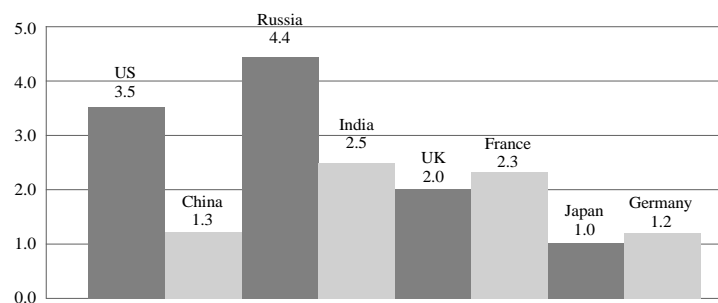
## Comparison of Defense Expenditure in the International Context

Among countries ranking high in defense expenditure in 2017, China's share of defense expenditure in GDP and government expenditure, as well as per capita and per-serviceperson defense spending, are all at a relatively low level.

China has become the world's second largest economy. The fact that China's defense expenditure ranks second in the world is determined by the demands of its national defense, the size of its economy, and the defensive nature of its national defense policy. In terms of total spending, China's defense expenditure in 2017 was less than a quarter of that of the US.

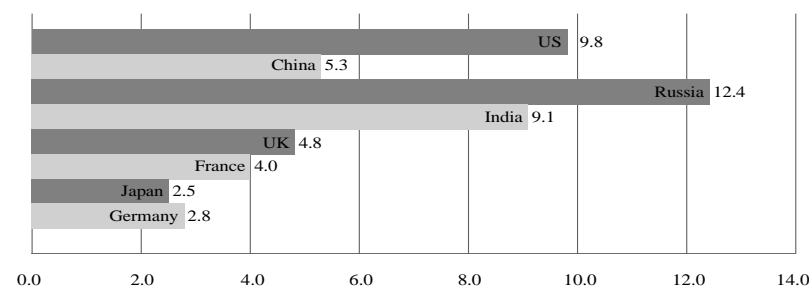
As a percentage of GDP, from 2012 to 2017, China's average defense expenditure was about 1.3%. Comparative figures were: the US about 3.5%, Russia 4.4%, India 2.5%, the UK 2.0%, France 2.3%, Japan 1.0%, and Germany 1.2%. China ranks 6th among these countries in terms of defense expenditure as a percentage of GDP on average and is the lowest among the permanent members of the UN Security Council (UNSC).

Figure 5 Average Ratio of Defense Expenditure to GDP by Country (2012-2017) (%)



Countries Ranking High in Defense Expenditure in 2017

Figure 6 Average Ratio of Defense Expenditure to Government Expenditure by Country (2012-2017) (%)



Countries Ranking High in Defense Expenditure in 2017

As a ratio of spending to government expenditure, from 2012 to 2017, China's average defense expenditure was 5.3%. Comparative figures were: the US about 9.8%, Russia 12.4%, India 9.1%, the UK 4.8%, France 4.0%, Japan 2.5%, and Germany 2.8%. China ranks 4th among these countries in terms of defense expenditure as a percentage of government expenditure on average.

China's per capita defense expenditure in 2017 was RMB750 – 5% of the US, 25% of Russia, 231% of India, 13% of the UK, 16% of France, 29% of Japan, and 20% of Germany. China's per-serviceperson defense expenditure was RMB521,600 – 15% of the US, 119% of Russia, 166% of India, 27% of the UK, 38% of France, 35% of Japan, and 30% of Germany. China's defense expenditure ranks 7th and 6th in per capita and per-serviceperson terms respectively among these countries.

# China's 2019 Defense White Paper on Chinese Military Spending - III

China reports and releases its defense expenditure through various mechanisms. Since 1978, the Chinese government has submitted annual budget reports to the National People's Congress and released the total amount of defense budget. In 1995, the Chinese government issued a white paper, *China: Arms Control and Disarmament*, releasing data concerning its defense expenditure to the world. Since 2007, China has joined the *UN Standardized Instrument for Reporting Military Expenditures* and has submitted annually to the UN the basic data on its defense expenditure for the latest fiscal year, reporting total spending as well as personnel expenses, training and sustainment expenses, and equipment expenses for the active force, reserve force and the militia respectively, along with an explanation of the application of China's defense expenditure and its ratio to GDP.

All in all, China's defense expenditure is open and transparent, and its spending is reasonable and appropriate. Compared to other major countries, the ratios of China's defense expenditure to GDP and to government expenditure, as well as the per capita defense expenditure of the country, remain at a relatively low level.

As the only major country yet to be completely reunified, and one of the countries with the most complex peripheral security environment, China faces serious challenges in safeguarding national sovereignty, territorial integrity, and maritime rights and interests. China is moving closer to the center of the world stage, and the international community expects more international public security goods from the Chinese military. In addition, China's armed forces are moving towards informationization and shouldering arduous tasks in following the trends of worldwide RMA and speeding up RMA with Chinese characteristics. There is still a wide gap between China's defense expenditure and the requirements for safeguarding national sovereignty, security and development interests, for fulfilling China's international responsibilities and obligations as a major country, and for China's development. In step with national economic development, defense expenditure of China will maintain a moderate and steady growth.

**Table 2 Breakdown of China's Defense Expenditure (2010-2017)**  
(in RMB billion yuan)

Year	Personnel Expense		Training and Sustainment Expense		Equipment Expense		Total
	Amount	Percentage (%)	Amount	Percentage (%)	Amount	Percentage (%)	
2010	185.931	34.9	170.047	31.9	177.359	33.2	533.337
2011	206.506	34.3	189.943	31.5	206.342	34.2	602.791
2012	195.572	29.2	232.994	34.8	240.626	36.0	669.192
2013	200.231	27.0	269.971	36.4	270.860	36.6	741.062
2014	237.234	28.6	267.982	32.3	323.738	39.1	828.954
2015	281.863	31.0	261.538	28.8	365.383	40.2	908.784
2016	306.001	31.3	266.994	27.4	403.589	41.3	976.584
2017	321.052	30.8	293.350	28.1	428.835	41.1	1043.237

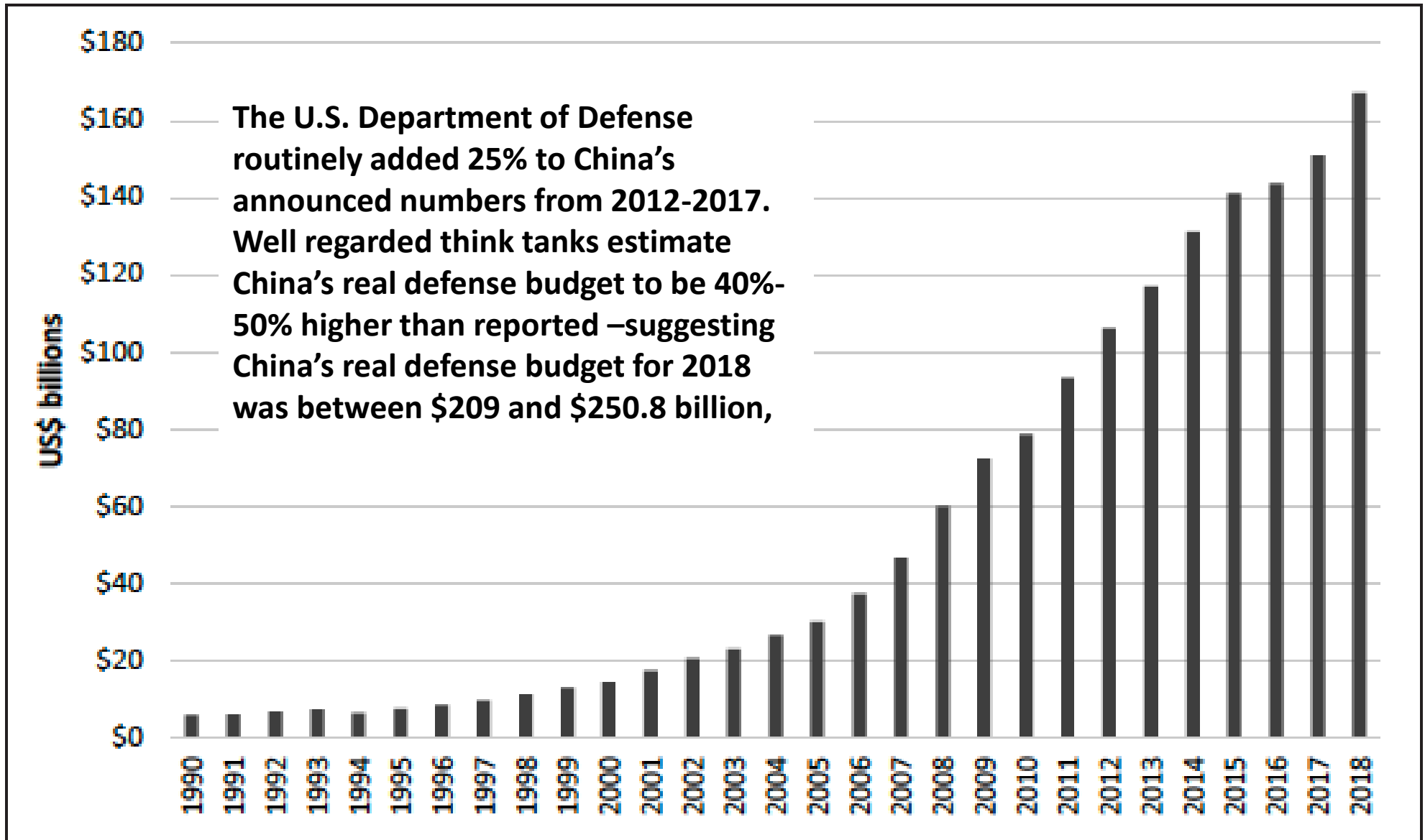
Sources: Data on China's defense expenditure submitted to the UN by the Chinese government

**Table 3 China's Defense Expenditure Since 2012**

Year	GDP (RMB billion)	Total Defense Expenditure (RMB billion)	CPI (Previous Year = 100)	Growth Rate of Government Expenditure (%)	Growth Rate of Defense Expenditure (%)	Defense Expenditure to GDP (%)	Defense Expenditure to Government Expenditure (%)	Real Defense Expenditure Growth Rate (Inflation-adjusted) (%)
2012	54036.74	669.192	102.6	15.29	11.02	1.24	5.31	8.42
2013	59524.44	741.062	102.6	11.32	10.74	1.24	5.29	8.14
2014	64397.4	828.954	102.0	8.25	11.86	1.29	5.46	9.86
2015	68905.21	908.784	101.4	15.87	9.63	1.32	5.17	8.23
2016	74358.55	976.584	102.0	6.75	7.46	1.31	5.20	5.46
2017	82712.17	1043.237	101.6	8.17	6.83	1.26	5.14	5.23



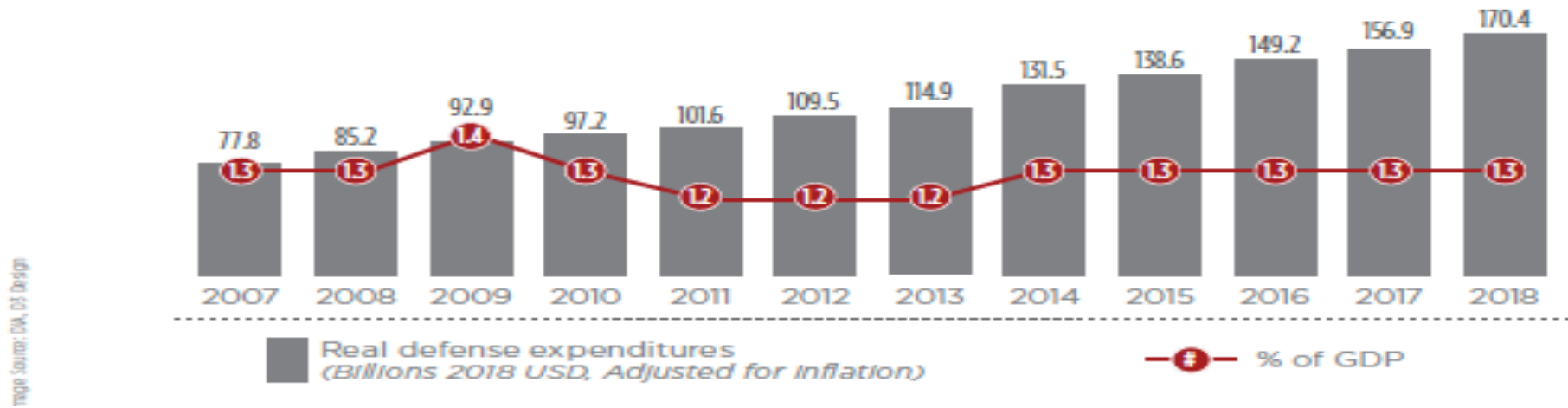
## U.S. Estimate of China's Announced Defense Spending: 1990-2018



Source: 2018 Report to Congress of the U.S. and China Security Review Commission 115th Congress, 2<sup>nd</sup> Session, November 2018, p. 175

# DIA on Chinese Military Spending- 2007-2018

*China's Official Defense Spending 2007-2018 (billions of 2018 dollars)*



China's approach to funding security requirements has been deliberate and substantial. China's military spending increased by an average of 10 percent (inflation adjusted) per year from 2000 to 2016 and has gradually slowed to 5- to 7-percent growth during the past 2 years. The official defense budget has remained at 1.2 to 1.4 percent of gross domestic product for the past decade, allowing for steady, sustainable expenditure growth and qualitative improvements throughout the PLA.

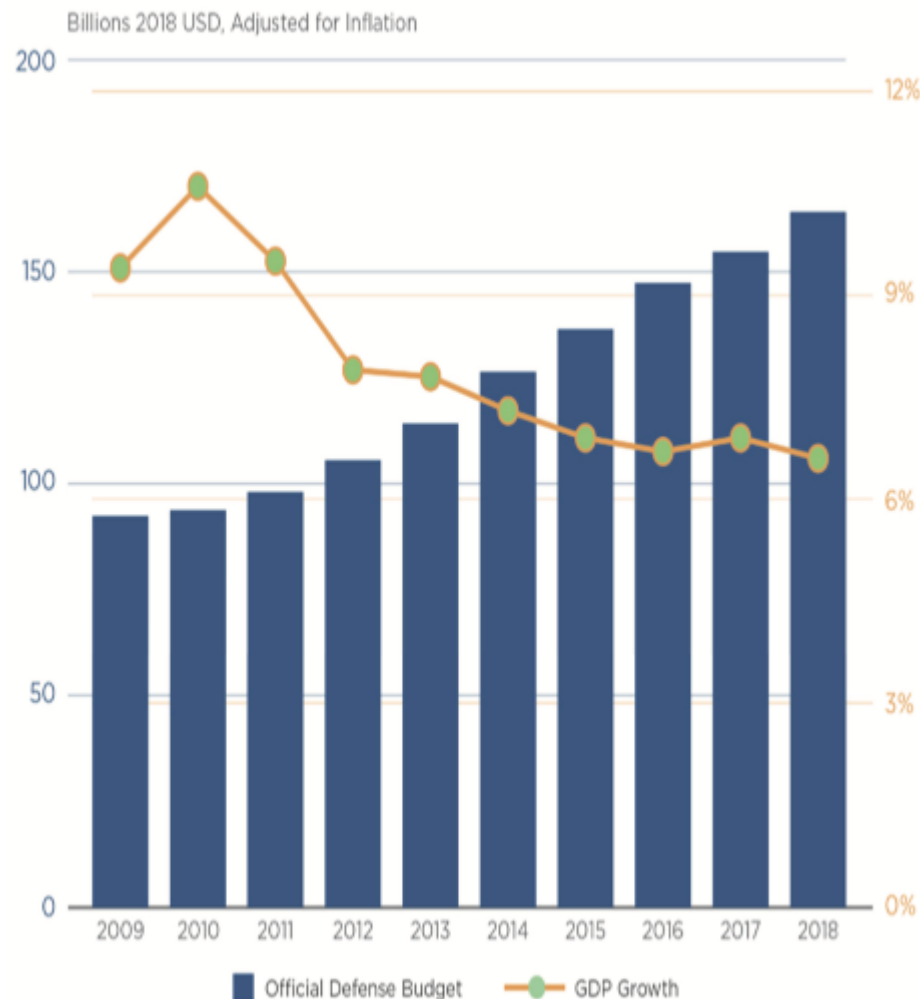
Estimating actual military expenses is difficult because of China's poor accounting transparency and incomplete transition to a market economy. The formal defense budget process does not include funding for foreign weapons procurement, some research and development (R&D), and certain personnel benefits. Other government ministries distribute defense funds in addition to extra budgetary funds that supplement personnel living subsidies, equipment maintenance, and other budgetary items.

However, using 2018 prices and exchange rates as an example, China's total military-related spending for 2018 probably exceeded \$200 billion, a threefold increase since 2002. Such spending has been on the rise since the 1990s, when China formally began to emphasize defense-related programs throughout the course of several "Five-Year Plans."

Although the total dollar value of China's defense budget remains significantly below that of the United States, China has benefited from "latecomer advantage." In other words, China has not had to invest in costly R&D of new technologies to the same degree as the United States. Rather, China has routinely adopted the best and most effective platforms found in foreign militaries through direct purchase, retrofits, or theft of intellectual property. By doing so, China has been able to focus on expediting its military modernization at a small fraction of the original cost.

# OSD on Chinese Military Spending- 2009-2018

## China's Official Defense Budget, 2009-2018



### China's Estimated Military Expenditures.

China's published military budget omits several major categories of expenditures, including R&D and foreign weapons procurement. Actual military-related spending is higher than stated in the official budget, estimated at more than \$200 billion in 2018. It is difficult to calculate actual military expenses, largely because of China's poor accounting transparency.

### China's Estimated Defense Budget Growth.

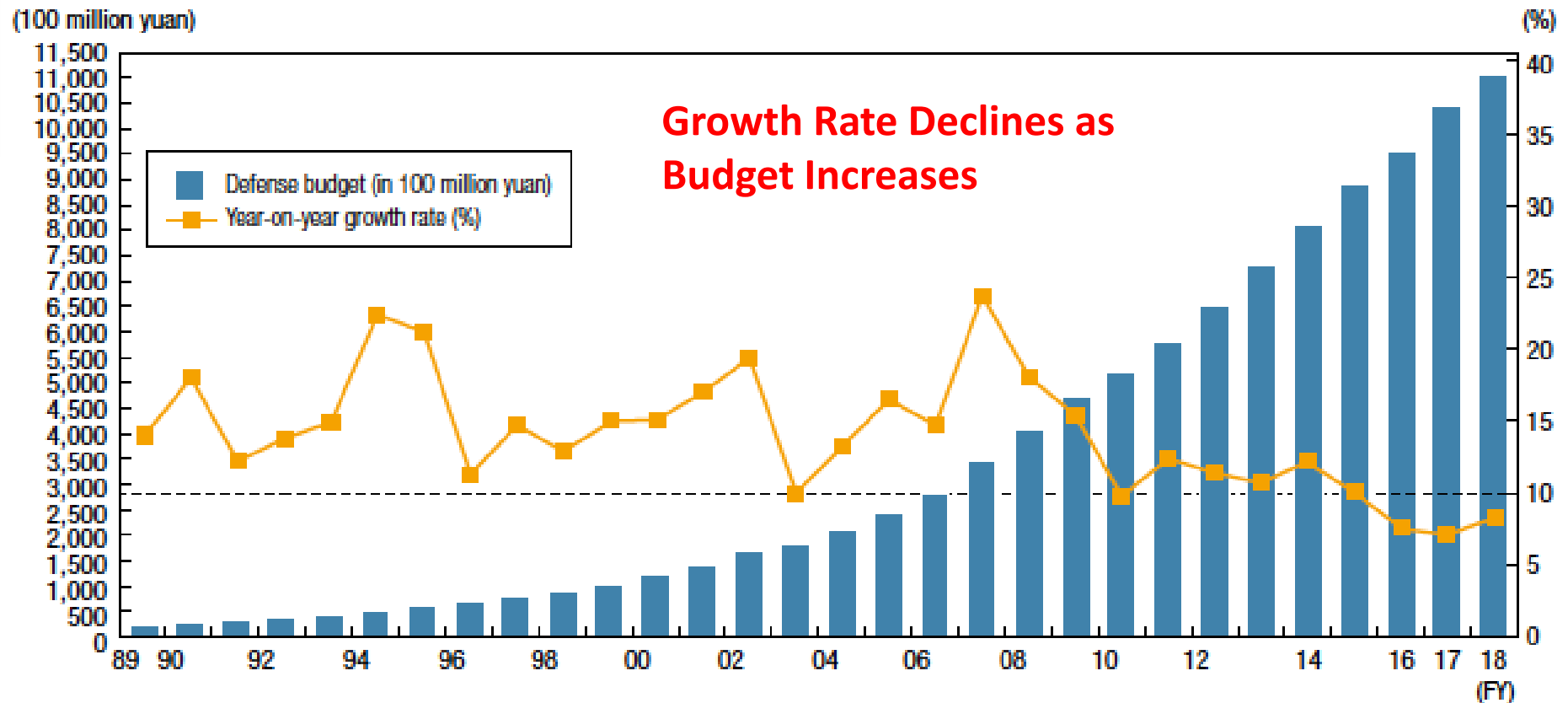
Over the next few years, China's official defense budget will likely increase by an

annual average of 6 percent, growing to \$260 billion by 2022. This will allow the PLA to dedicate more money for training, operations, and modernization following China's 2015 reforms, which reduced the PLA's size by 300,000 personnel. Economic forecasters project that China's economic growth will slow during the next 10 years, falling from 6.6 percent in 2018 to 3 percent in 2030, which could slow future defense spending growth. Assuming accurate economic projections and a steady defense burden, China will remain the largest spender in the Indo-Pacific region besides the United States.

### 2018 Official Defense Budget Comparison (adjusted for inflation to 2018 USD)

	Billion (USD)
China (official budget)	\$170.4
India	\$60.8
Japan	\$47.4
Russia (national defense budget)	\$43.8
South Korea	\$36.6
Taiwan	\$10.6

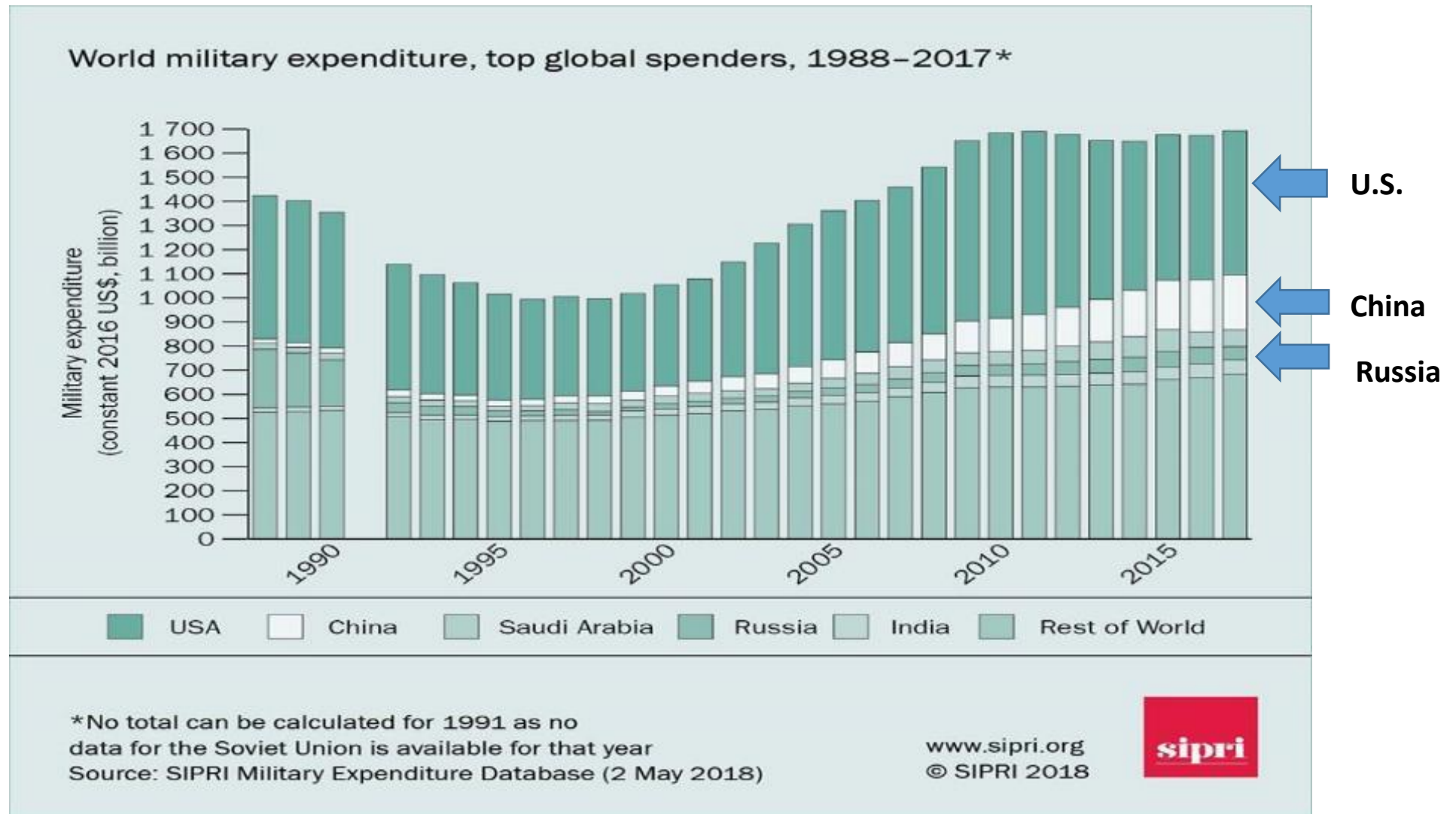
# Japanese Estimate of China's Announced Defense Budget 1989-2018



Note: This basically shows the defense budget within "the central government's general public budget," which had been named as "the central fiscal expenditures" prior to FY 2014. Year-on-year growth rate compares the budget of a given year against the budget of the previous year. Note that FY2002 defense budget was calculated based on the increased amount from the defense budget in the previous FY because only the amount and rate of growth were released. For FY 2016 and FY2018, the amount of "the central government expenditures," which are part of the central government's general public budget, are used because only the central government expenditures were announced.

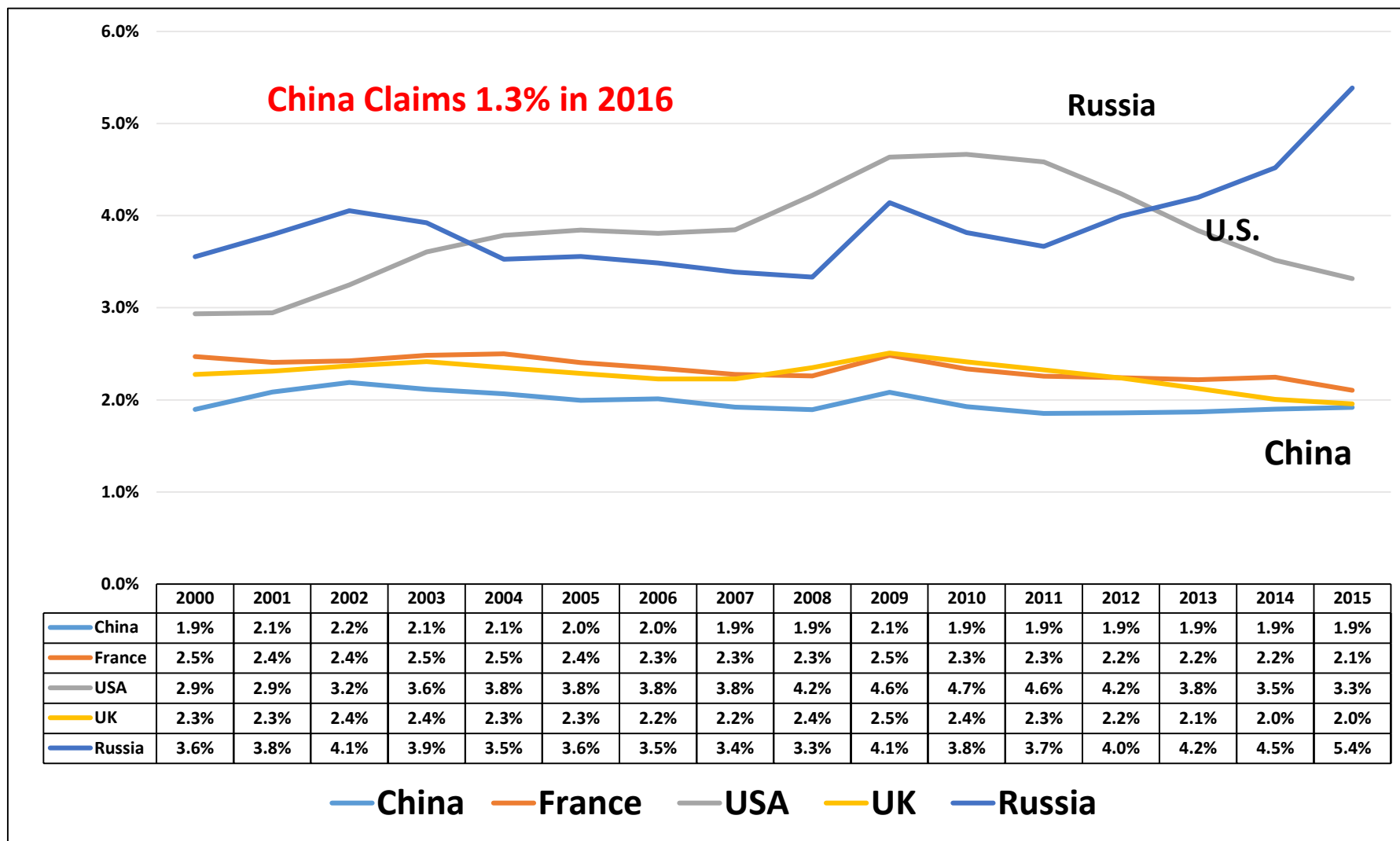
# Military Expenditures by Country: SIPRI 1988-2017

(Current \$US Billions)



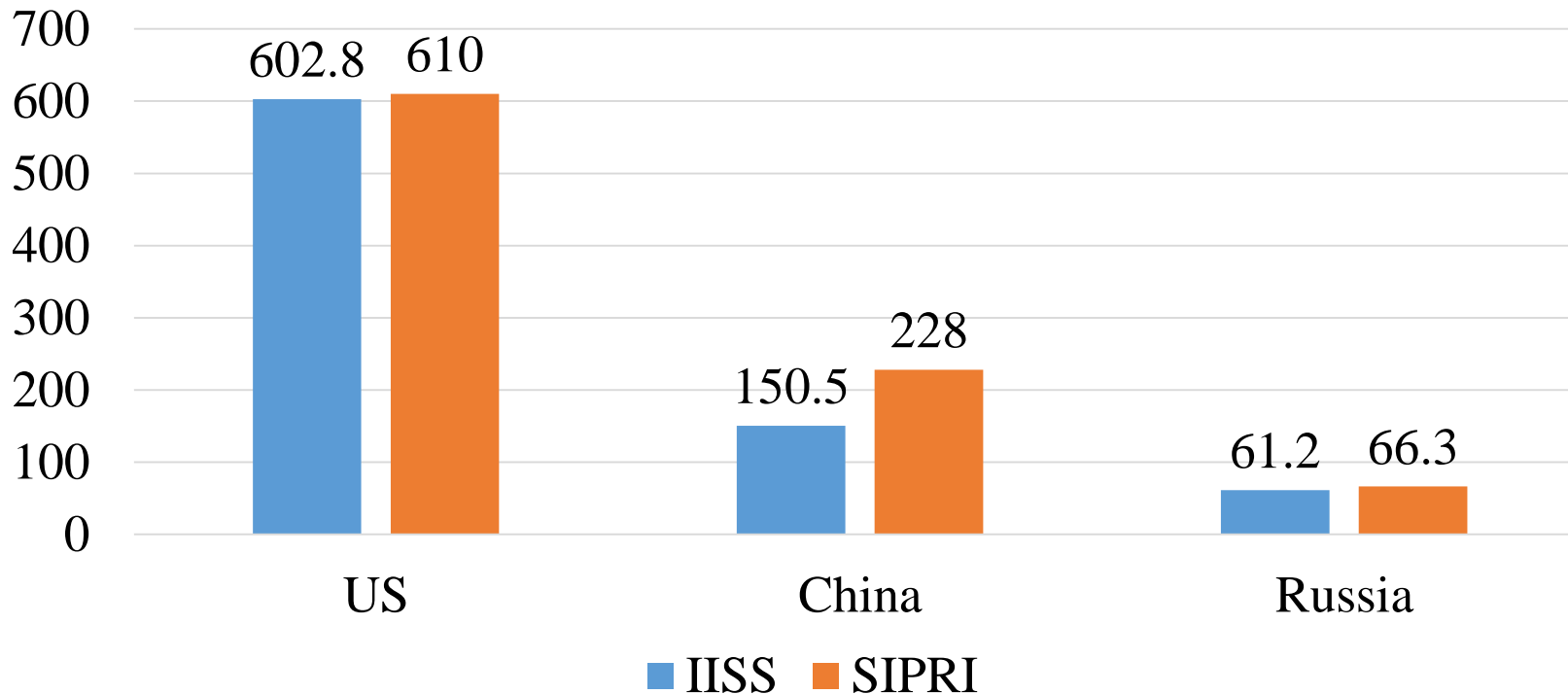


## Military Expenditures as Percent of GDP by UNSC Country: SIPRI 1990-2015



# IISS versus SIPRI Estimates of Military Spending in 2017

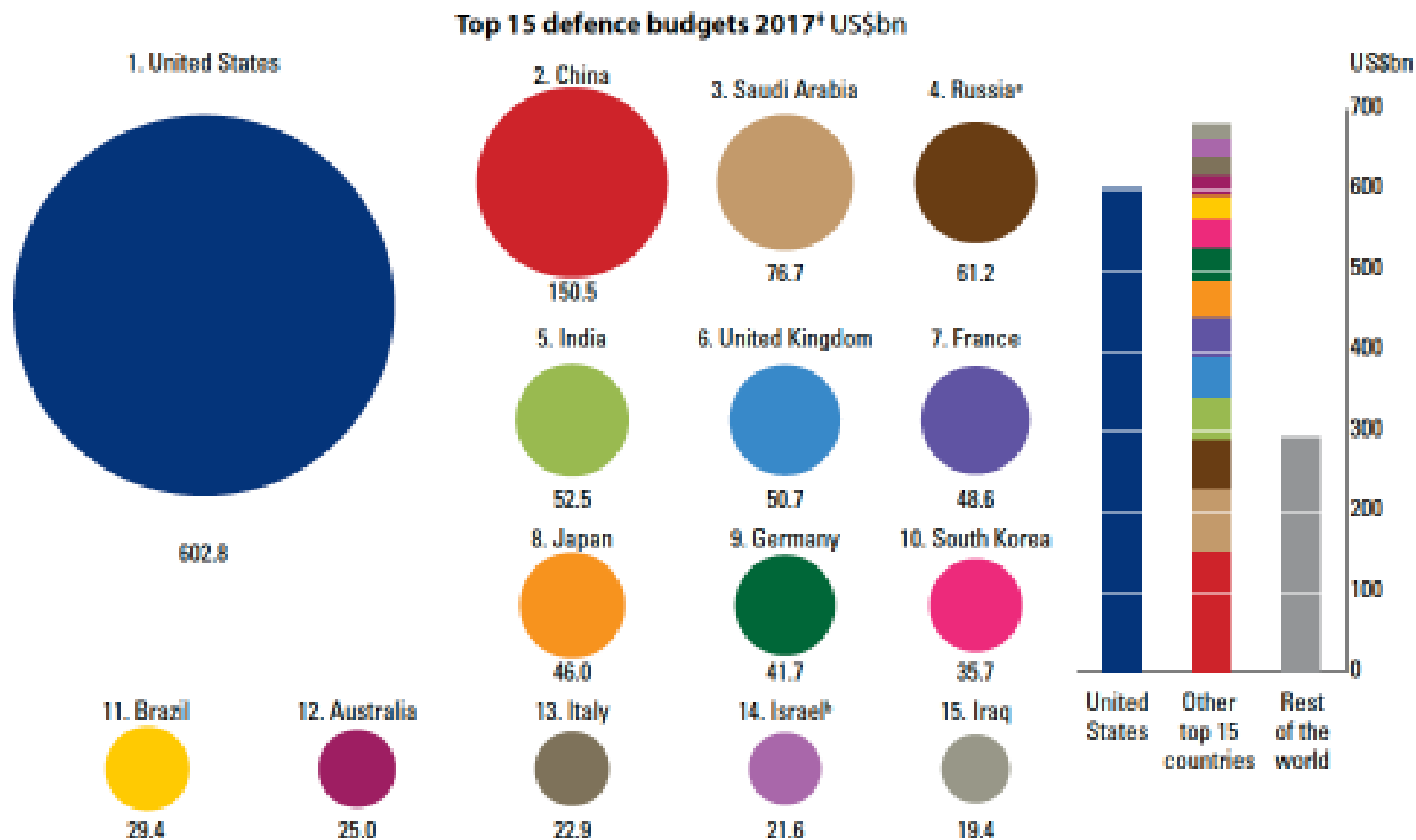
(\$USD Current Billions)



**IISS:** China officially earmarked RMB1.02 trillion(US\$150 billion) in 2017 for defense, although this number is considered to exclude key expenses such as research and development (R&D) and arms imports. This represents a nominal increase of 7.1%compared to 2016, when China allocated RMB955bn (US\$144bn) to defense. The next-largest defense spenders in Asia were India (R3.6trn, or US \$52.5bn) and Japan (¥5.13trn, or US\$46bn).

**SIPRI:** China, the second largest spender globally, increased its military spending by 5.6 percent to \$228 billion in 2017. China's spending as a share of world military expenditure has risen from 5.8 percent in 2008 to 13 percent in 2017. India spent \$63.9 billion on its military in 2017, an increase of 5.5 percent compared with 2016, while South Korea's spending, at \$39.2 billion, rose by 1.7 percent between 2016 and 2017.

# IISS Top Fifteen Military Budgets: 2017



<sup>a</sup>Under NATO defence-spending definition; <sup>b</sup>Includes US Foreign Military Assistance

Note: US dollar totals are calculated using average market exchange rates for 2017, derived using IMF data. The relative position of countries will vary not only as a result of actual adjustments in defence-spending levels, but also due to exchange-rate fluctuations between domestic currencies and the US dollar. The use of average exchange rates reduces these fluctuations, but the effects of such movements can be significant in a number of cases.

IISS

# SIPRI Top Fifteen Global Military Budgets: 2017

Countries with highest military expenditure  
In current 2017 US\$ billion



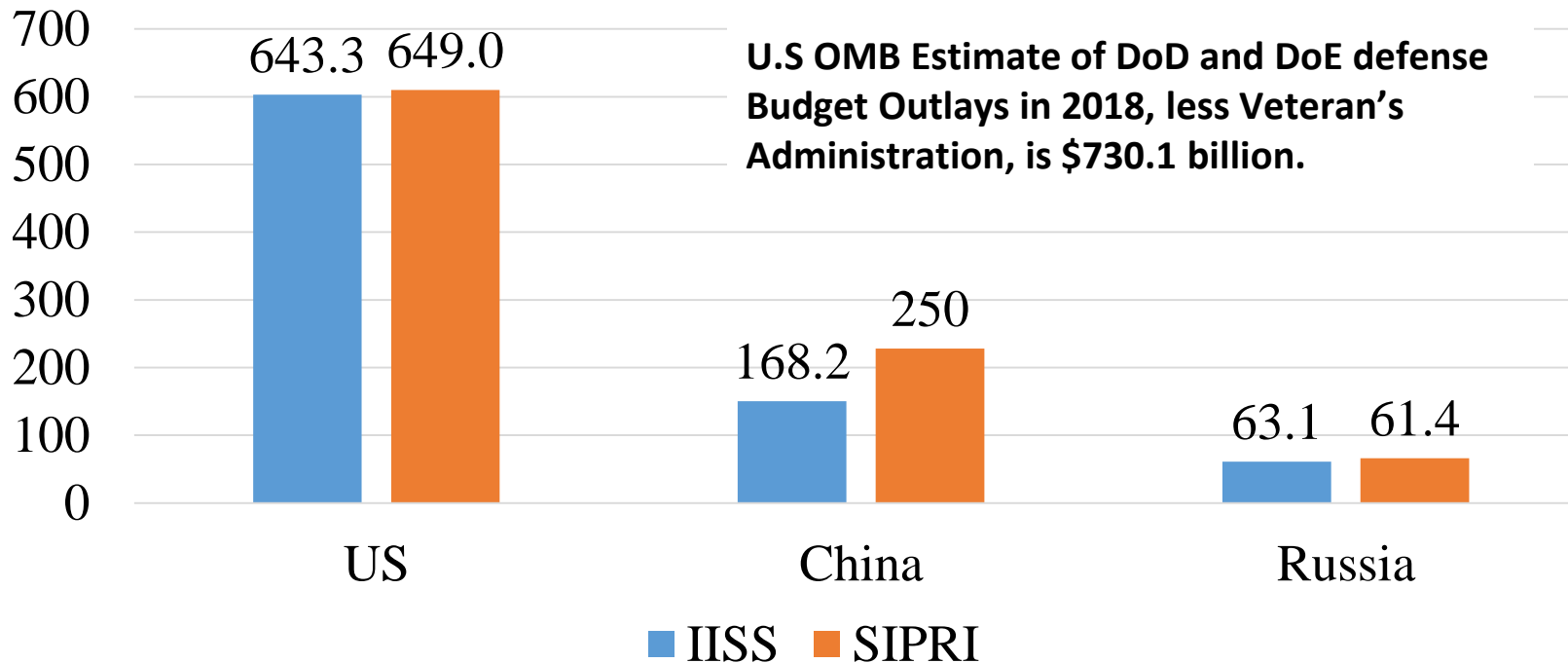
Source: SIPRI Military Expenditure Database

www.sipri.org  
© SIPRI 2018



# IISS versus SIPRI Estimates of Military Spending in 2018

(\$USD Current Billions)



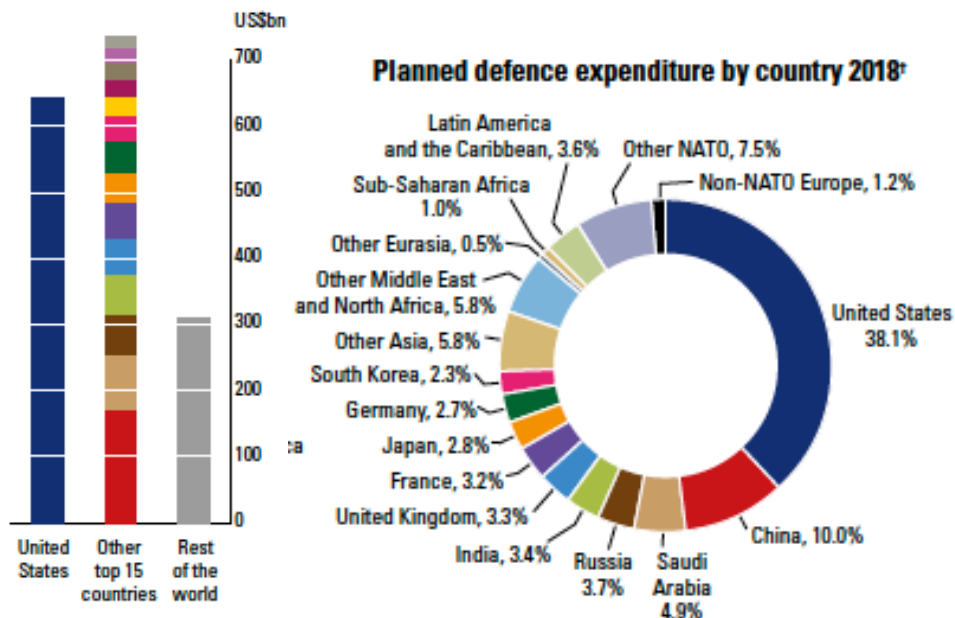
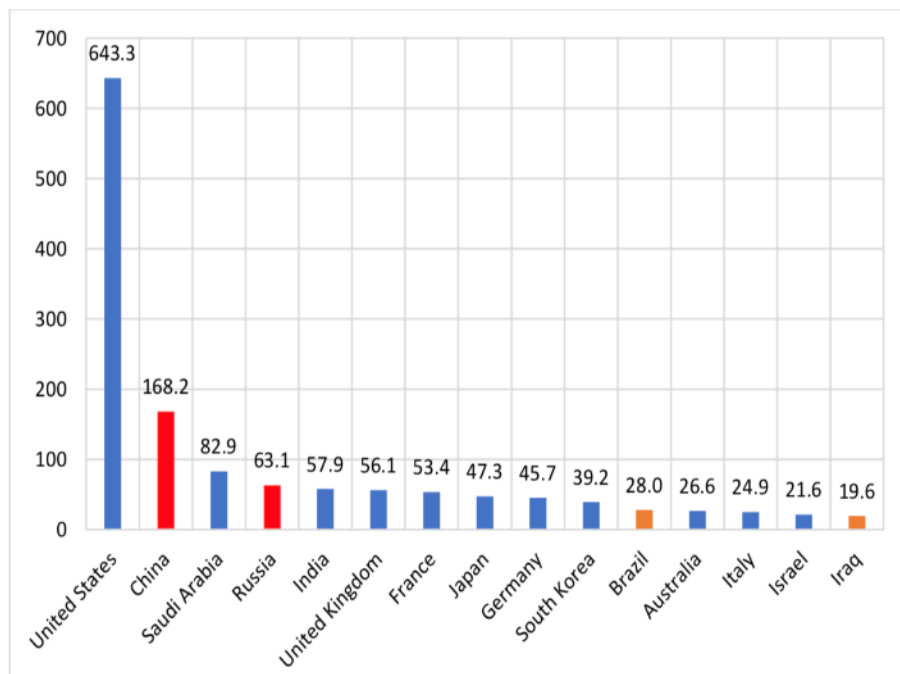
**IISS:** Asian defense spending continues to increase. It grew by 4.0% in real terms between 2017 and 2018, picking up speed after a year of slower growth; the rate had been 2.8% between 2016 and 2017. Some of the region's top spenders drove the increase. In real terms, Australia's defense budget grew by 8.4%, China's by 5.7% and South Korea's by 4.5%.

**SIPRI:** China, the second-largest spender in the world, increased its military expenditure by 5.0 percent to \$250 billion in 2018. This was the 24th consecutive year of increase in Chinese military expenditure. Its spending in 2018 was almost 10 times higher than in 1994, and accounted for 14 percent of world military spending. 'Growth in Chinese military spending tracks the country's overall economic growth,' says Tian. 'China has allocated 1.9 percent of its GDP to the military every year since 2013.'

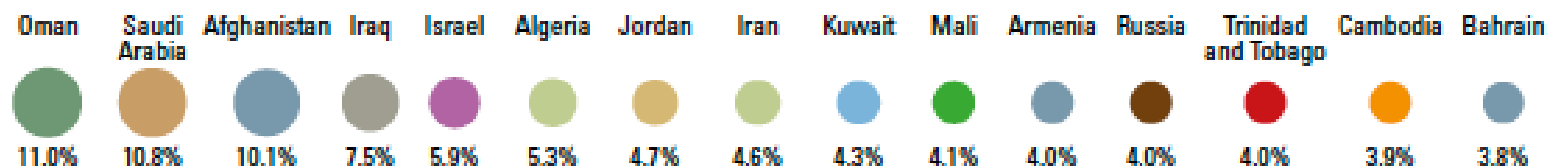


# IISS Estimate of U.S., Chinese, and Top Military Budgets: 2018

Top 15 defence budgets 2018\* US\$bn

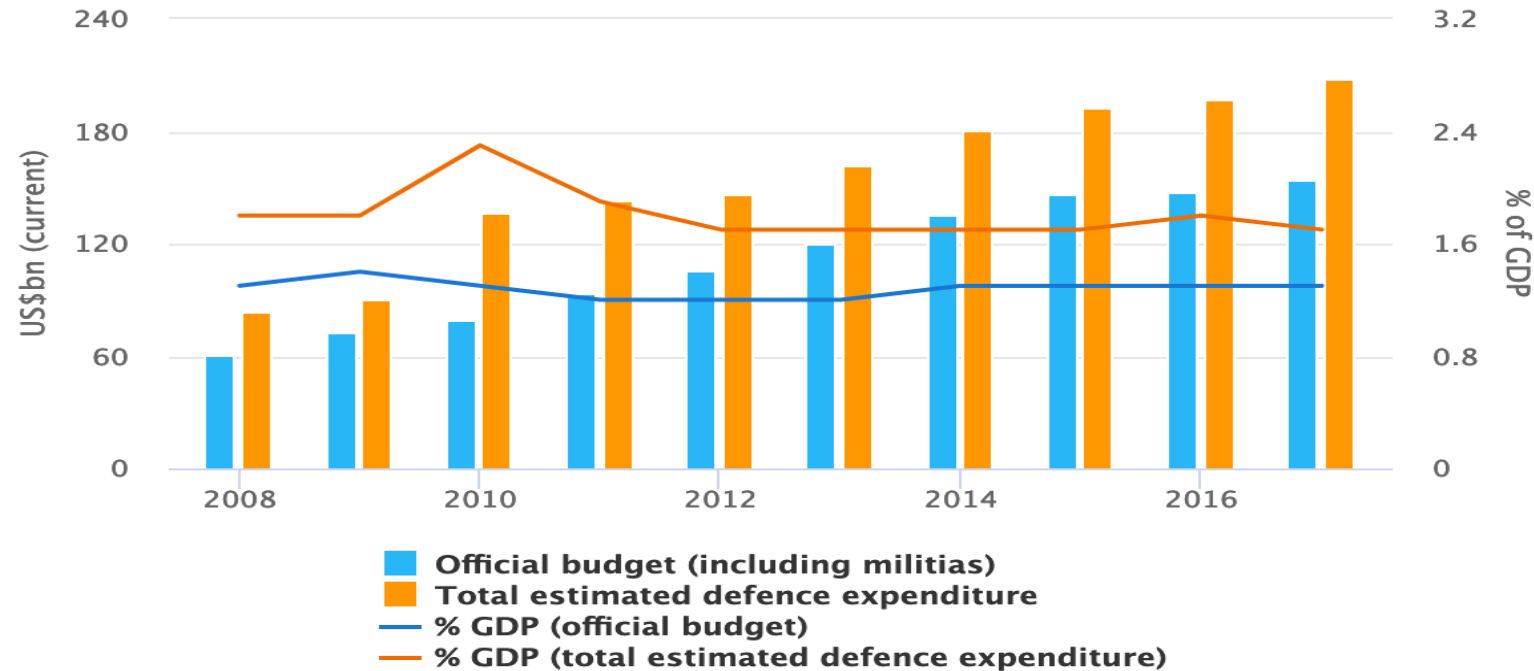


2018 top 15 defence and security budgets as a % of GDP\*



# IISS Estimate of Possible Real Total Cost of Chinese Budget - I

Figure 1. China: official defence budget versus total estimated defence expenditure, 2010–17 (US\$bn, current)



Sources: IISS Military Balance+

The IISS estimates China's total military outlays to have amounted to RMB1.41 trillion (US\$209 billion) in 2017. This includes the central and local defence budget, foreign weapon purchases, estimates of defence research and development (R&D), and the central People's Armed Police budget. Taking these additional budget items into account, Chinese defence spending over the past decade appears to be around 1.7–1.8% of GDP rather than the official 1.2–1.3%. This represents an additional 35% of military outlays on top of the official number.

# IISS Estimate of Possible Real Total Cost of Chinese Budget - II

As in previous white papers, the categories of spending include ‘personnel’, ‘training and sustainment’ (formerly called ‘operations’) and equipment. The latter category includes R&D, testing, procurement, repairs, maintenance, transport and the storage of weaponry and equipment. Appendices attached to the white paper include a detailed table and show the growth of the equipment category in particular, from 31.9% of the budget in 2010 to 41.1% in 2017. This is consistent with the observed pace of the People’s Liberation Army’s (PLA’s) equipment-modernisation programme over the past decade. The proportion allocated to equipment and R&D is now similar to Russia’s spending levels for similar categories of expenses.

Table 1. China’s defence expenditure, 2010–17 (US\$bn)

Year	Personnel Expense		Training and Sustainment Expense		Equipment Expense		Total
	Amount (US\$bn)	Percentage	Amount (US\$bn)	Percentage	Amount (US\$bn)	Percentage	
2010	27.5	34.9	25.1	31.9	26.2	33.2	78.8
2011	32.0	34.3	29.4	31.5	31.9	34.2	93.3
2012	31.0	29.2	36.9	34.8	38.1	36	106.0
2013	32.3	27	43.6	36.4	43.7	36.6	119.6
2014	38.6	28.6	43.6	32.3	52.7	39.1	134.9
2015	45.3	31	42.0	28.8	58.7	40.2	145.9
2016	46.1	31.3	40.2	27.4	60.7	41.3	147.0
2017	47.5	30.8	43.4	28.1	63.4	41.1	154.4

Source: China’s 2019 Defence White Paper

These category totals differ slightly from the Ministry of Finance’s budget reports, which account for central government expenditure, but do match the government’s statistical yearbook [figures](#) (Section 7.3) for the total of central and local government funding. This discrepancy is explained by taking into account China’s [latest submission](#) to the United Nations military-expenditure reporting tool, for the year 2017. This reveals that the difference between the total of RMB1043trn (US\$154bn) reported in the white paper and statistical yearbook, and the RMB1023trn (US\$151bn) figure from the Ministry of Finance budget reports is due to the inclusion of the ‘militia and others’ category.

Table 2. People’s Republic of China military expenditure: submission to the United Nations, 2017 (US\$bn)

Category	Active forces	Reserve forces	Militia and others	Total	
				Amount (US\$bn)	Percentage
Personnel	47.0	0.5	0.0	47.5	30.8
Training and maintenance	39.7	0.7	3.0	43.4	28.1
Equipment	62.8	0.6	0.0	63.4	41.1
Total	149.5	1.8	3.0	154.4	100

Source: China’s 2017 submission to the United Nations military expenditure reporting tool

In addition, other observers have [reported](#) that the official budget also excludes the costs of building indigenous aircraft carriers and the PLA’s 70th anniversary military parade. If true, this information would push total defence expenditure even further up.

# SIPRI Estimate of U.S., Chinese, and Top Military Budgets: 2018

Note: IISS estimate  
for China is \$168.2B,  
SIPRI Estimate is  
\$250B – 49% higher)

Source: nan tian, aude fleurant,  
alexandra kuimova, pieter d.  
wezeman and siemon t.  
wezeman,  
TRENDS IN WORLD MILITARY  
EXPENDITURE, 2018, SIPRI Fact  
Sheet, April 2019  
<https://www.sipri.org/publications/2019/sipri-fact-sheets/trends-world-military-expenditure-2018>.

Rank		Country	Spending (\$ b.), 2018	Change (%), 2009–18	Spending as a share of GDP (%) <sup>b</sup>		World share (%), 2018
2018	2017 <sup>a</sup>				2018	2009	
1	1	United States	649	-17	3.2	4.6	36
2	2	China	[250]	83	[1.9]	[2.1]	[14]
3	3	Saudi Arabia	[67.6]	28	[8.8]	9.6	[3.7]
4	5	India	66.5	29	2.4	2.9	3.7
5	6	France	63.8	1.6	2.3	2.5	3.5
Subtotal top 5			1 097	..	..	..	60
6	4	Russia	61.4	27	3.9	3.9	3.4
7	7	United Kingdom	50.0	-17	1.8	2.4	2.7
8	9	Germany	49.5	9.0	1.2	1.4	2.7
9	8	Japan	46.6	2.3	0.9	1.0	2.6
10	10	South Korea	43.1	28	2.6	2.7	2.4
Subtotal top 10			1 347	..	..	..	74
11	13	Italy	27.8	-14	1.3	1.6	1.5
12	11	Brazil	27.8	17	1.5	1.5	1.5
13	12	Australia	26.7	21	1.9	1.9	1.5
14	14	Canada	21.6	12	1.3	1.4	1.2
15	15	Turkey	19.0	65	2.5	2.5	1.0
Subtotal top 15			1 470	..	..	..	81
16	16	Spain	18.2	-5.2	1.3	1.3	1.0
17	17	Israel	15.9	-5.8	4.3	6.8	0.9
18	18	Iran	13.2	-10	2.7	3.2	0.7
19	24	Poland	11.6	48	2.0	1.8	0.6
20	19	Pakistan	11.4	73	4.0	3.3	0.6
21	25	Netherlands	11.2	-4.4	1.2	1.4	0.6
22	21	Singapore	10.8	13	3.1	3.9	0.6
23	20	Taiwan	10.7	-2.9	1.8	2.3	0.6
24	23	Colombia	10.6	15	3.2	3.9	0.6
25	22	Algeria	9.6	85	5.3	3.8	0.5
26	26	Indonesia	7.4	99	0.7	0.6	0.4
27	29	Kuwait	7.3	39	5.1	4.0	0.4
28	30	Norway	7.1	23	1.6	1.6	0.4
29	31	Thailand	6.8	16	1.3	1.8	0.4
30	28	Oman	[6.7]	69	[8.2]	[7.0]	[0.4]
31	32	Mexico	6.6	36	0.5	0.5	0.4
32	27	Iraq	6.3	58	2.7	2.9	0.3
33	33	Sweden	5.8	18	1.0	1.2	0.3
34	35	Chile	5.6	25	1.9	2.3	0.3
35	37	Viet Nam	5.5	76	2.3	2.3	0.3
36	36	Greece	5.2	-46	2.4	3.2	0.3
37	39	Belgium	5.0	-12	0.9	1.2	0.3
38	38	Switzerland	4.8	6.3	0.7	0.7	0.3
39	43	Ukraine	4.8	69	3.8	[2.8]	0.3
40	46	Romania	4.6	112	1.9	1.3	0.3
Subtotal top 40			1 683	..	..	..	93
World			1 822	5.4	2.1	2.6	100

# OSD on Chinese Comparable Military Spending in 2019

## China's Estimated Military Expenditures.

China's published military budget omits several major categories of expenditures, including R&D and foreign weapons procurement. **Actual military-related spending is higher than stated in the official budget, estimated at more than \$200 billion in 2018.** It is difficult to calculate actual military expenses, largely because of China's poor accounting transparency.

**China's Estimated Defense Budget Growth.** Over the next few years, **China's official defense budget will likely increase by an annual average of 6 percent, growing to \$260 billion by 2022.** This will allow the PLA to dedicate more money for training, operations, and modernization following China's 2015 reforms, which reduced the PLA's size by 300,000 personnel.

Economic forecasters project that China's economic growth will slow during the next 10 years, falling from 6.6 percent in 2018 to 3 percent in 2030, which could slow future defense spending growth. Assuming accurate economic projections and a steady defense burden, China will remain the largest spender in the Indo-Pacific region besides the United States

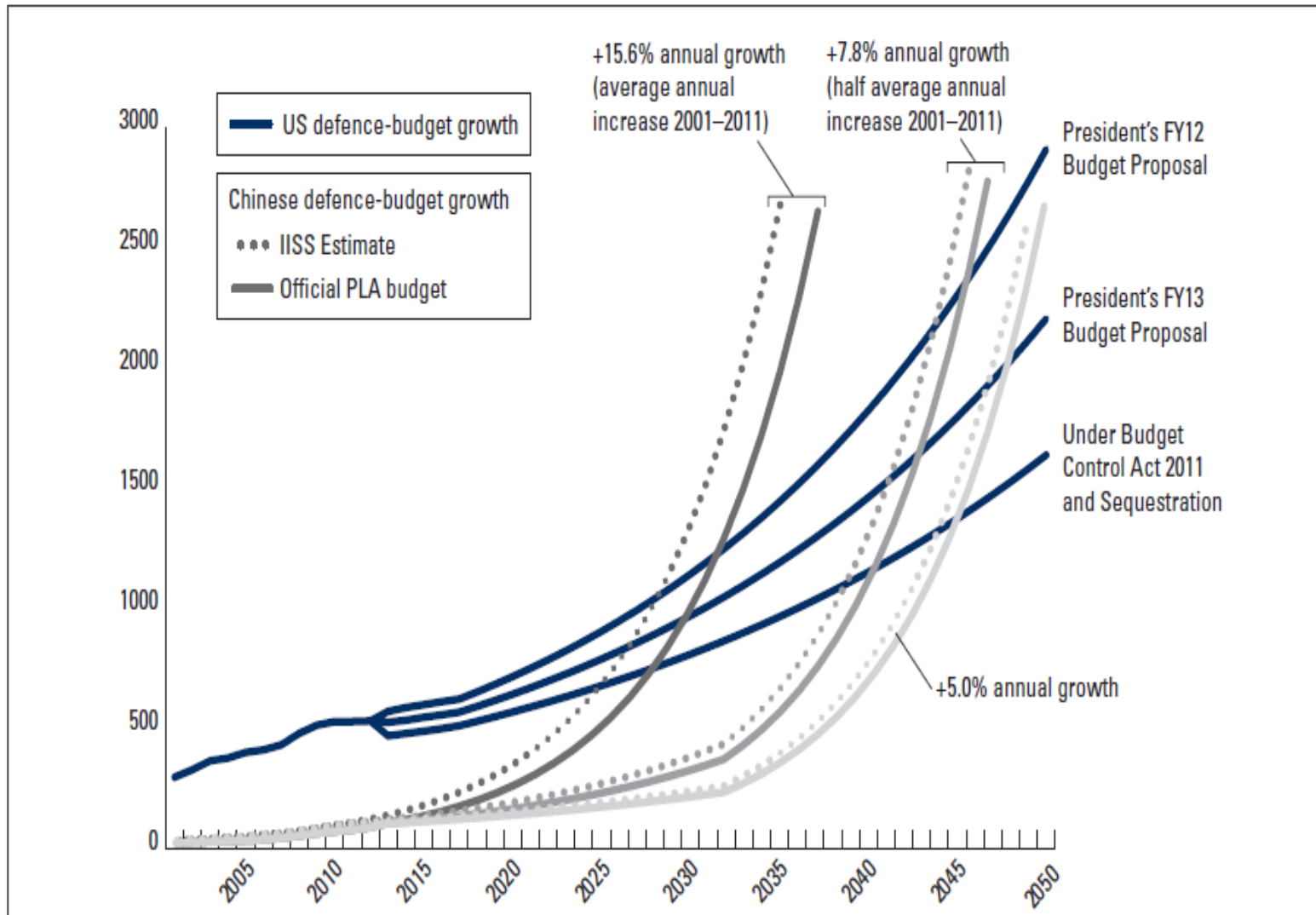
## 2018 Official Defense Budget Comparison as Publicly Stated by Countries Listed (adjusted for inflation to 2018 USD)

	Billion (USD)
China (official budget)	\$170.4
India	\$60.8
Japan	\$47.4
Russia (national defense budget)	\$43.8
South Korea	\$36.6
Taiwan	\$10.6

- **NATO reports \$672.3 billion in U.S. spending in 2018. DoD reports \$730.1 billion in U.S. Outlays for DoD and DoE**
- **NATO Reports \$276.0 billion in NATO European spending**



# China versus U.S.: Convergence in Military Spending — IISS vs. OSD Guesstimate



China-United States Defence Expenditure Convergence 2001-2050

OSD expects China's defense budget to increase by an annual average of 7 percent... Growing to \$260 billion by 2020 for a force that, although expanding, is expected over the near-term to remain primarily regional.

As of March 2016, the DoD Comptroller forecasted that U.S. defense budget outlays will reach \$606 billion in current dollars over the same period for a force with a global footprint.

# China's Rising Military Technology and Industrial Base

# China 2019 Defense White Paper on Technology and Industrial Base - I

Major countries around the world are readjusting their security and military strategies and military organizational structures. They are developing new types of combat forces to seize the strategic commanding heights in military competition. The US is engaging in technological and institutional innovation in pursuit of absolute military superiority. Russia is advancing its New Look military reform. Meanwhile, the UK, France, Germany, Japan and India are rebalancing and optimizing the structure of their military forces.

Driven by the new round of technological and industrial revolution, the application of cutting-edge technologies such as artificial intelligence (AI), quantum information, big data, cloud computing and the Internet of Things is gathering pace in the military field. International military competition is undergoing historic changes. New and high-tech military technologies based on IT are developing rapidly. There is a prevailing trend to develop long-range precision, intelligent, stealthy or unmanned weaponry and equipment. War is evolving in form towards informationized warfare, and intelligent warfare is on the horizon.

Great progress has been made in the Revolution in Military Affairs (RMA) with Chinese characteristics. However, the People's Liberation Army (PLA) has yet to complete the task of mechanization, and is in urgent need of improving its informationization. China's military security is confronted by risks from technology surprise and growing technological generation gap. Greater efforts have to be invested in military modernization to meet national security demands. The PLA still lags far behind the world's leading militaries.

...Efforts will be made to advance the integrated development of mechanization and informationization, speed up the development of intelligent military, create a modernized military force structure with Chinese characteristics, improve and develop socialist military institutions with Chinese features, and constantly enhance the capabilities to fulfill the missions and tasks in the new era...The strategic goals for the development of China's national defense and military in the new era are:

- to generally achieve mechanization by the year 2020 with significantly enhanced informationization and greatly improved strategic capabilities;
- to comprehensively advance the modernization of military theory, organizational structure, military personnel, and weaponry and equipment in step with the modernization of the country and basically complete the modernization of national defense and the military by 2035; and
- to fully transform the people's armed forces into world-class forces by the mid-21st century.

...Outer space is a critical domain in international strategic competition. Outer space security provides strategic assurance for national and social development. In the interest of the peaceful use of outer space, China actively participates in international space cooperation, develops relevant technologies and capabilities, advances holistic management of space-based information resources, strengthens space situation awareness, safeguards space assets, and enhances the capacity to safely enter, exit and openly use outer space.

# China 2019 Defense White Paper on Technology and Industrial Base - II

Cyberspace is a key area for national security, economic growth and social development. Cyber security remains a global challenge and poses a severe threat to China. China's armed forces accelerate the building of their cyberspace capabilities, develop cyber security and defense means, and build cyber defense capabilities consistent with China's international standing and its status as a major cyber country. They reinforce national cyber border defense, and promptly detect and counter network intrusions. They safeguard information and cyber security, and resolutely maintain national cyber sovereignty, information security and social stability.

*...Promoting innovation in defense S&T and military theory.* China's armed forces are accelerating the implementation of the strategy to develop the military through S&T in a bid to maintain and enhance the strength of the areas where they lead, and intensify innovation in emerging areas. They have made great progress in independent innovation in some strategic, cutting-edge and disruptive technologies, and succeeded in developing strategic hi-tech products such as the Tianhe-2 supercomputer. Focusing on war and fighting wars, China's armed forces have innovated in military doctrines and delivered outcomes in military strategy, joint operations and informationization, which have provided a theoretical support to defense and military development.

*Establishing a modernized weaponry and equipment system.* China's armed forces are optimizing the overall composition of weaponry and equipment, coordinating the efforts of all services and arms in this regard, promoting the balanced development of main battle equipment, information systems, and support equipment, with a view to comprehensively raising standardization, serial development and interoperability. Old equipment is being phased out, and a system created that mainly comprises new and high-tech weaponry and equipment. Type 15 tanks, type 052D destroyers, J-20 fighters, and DF-26 intermediate and long-range ballistic missiles have been commissioned.

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# OSD on Chinese Civil-Military Integration

## Key Takeaways

- In recent years, China's leaders have elevated CMI to a national strategy focused on aligning civil and defense technology development to achieve greater efficiency, innovation, and growth.
- China wants the successes of CMI to support completing military modernization by 2035 and developing a "world-class" military by 2049.

After existing in various forms since the beginning of the PRC, CMI, also known as military-civil fusion, became a military hardware modernization strategy in the 1990s, evolving as China moved from primarily acquiring foreign defense technologies to modernizing its industrial base and developing domestic defense technologies. In 2015, President Xi elevated CMI to a national strategy focused on aligning civil and defense technology development to achieve greater efficiency, innovation, and growth.

President Xi called on CMI to support the "basic" completion of PLA modernization by 2035 and the status of China as a "world-class" military power by mid-century. China incentivized the civilian sector to enter the defense market through tax incentives and other financial subsidies, and set up a procurement website to enable public bids on defense contracts. Ineffective top-level coordination, corruption, and lack of understanding on how to implement CMI slowed progress.

In 2017, China established a central committee for CMI development to centralize government control and oversight of CMI and to break down organizational barriers to implementation. The committee has issued guidance on public outsourcing of defense contracts and regulations to align technology standards in order to improve cooperation on joint projects. The committee has also promoted increased innovation in defense technology development with plans for provincial-level CMI demonstration zones where participants experiment with methods of decreasing organizational impediments and practicing innovation.

While chairing the third meeting of the committee in 2018, President Xi called for more focused reforms of weapons procurement systems and other CMI efforts to generate breakthroughs in 2018. The national CMI strategy goes beyond hardware modernization to include initiatives in the education, personnel, investment, infrastructure, and logistics sectors. The PLA is downsizing the number of uniformed defense industry personnel and integrating civilian personnel into military research, training, and operations. The national CMI strategy also emphasizes harnessing emerging dual-use technologies such as AI, machine learning, big data, and unmanned systems to facilitate what PLA writings refer to as "intelligentized" warfare, or using multiple data streams and information flows to enable PLA operations.



# OSD on China's Rising Military Technology and Industrial Base - I

China's investment in technology and its manufacturing base—coupled to its rising military expenditures, sophisticated technology espionage activities, and imports of high technology weapons—, have radically improved its military technology and industrial base as well. Assessments differ over such assessments and China consistently denies that it undertakes such espionage activities, but the U.S. Office of the Secretary of Defense (OSD) reported to Congress in 2019 that China was still carrying out major such espionage activities in the United States and had made major advances in its efforts to achieve parity with the U.S. Russia, and Europe.

## DEVELOPMENTS AND TRENDS IN CHINA'S DEFENSE INDUSTRY

### Key Takeaways

- > China's defense-industrial complex continues to adapt and reorganize to improve weapon system research, development, acquisition, test, evaluation, and production.
- > China has realigned its S&T decision-making apparatus by establishing two advisory groups that promote a strategic approach to military modernization and enhance collaboration.

**Defense Sector Reform.** China's defense-industrial complex continues to adapt and reorganize to improve weapon system research, development, acquisition, test, evaluation, and production (RDAT&P). Inherent to this effort is a realignment of China's S&T decision-making apparatus and the establishment of two advisory groups at the highest levels of government. One group is focused on promoting a strategic approach to military modernization, and the other encourages innovation through a doctrine of increased collaboration between China's military- and state-owned (defense) industrial sector and its private and commercial industrial enterprises. During the past four years, the CMC and the State Council implemented organizational and policy changes to advance the PLA's defense research and increase its

capacity for innovation through market sector cooperation.

- > One of the most influential reforms to help improve RDAT&P occurred in 2015 with the establishment of the Strategic Committee of Science, Technology, and Industry Development for National Defense, a high-level advisory group chaired by the State Administration for Science, Technology, and Industry for National Defense. The committee, comprising military and civilian industrial, government, and technical leaders and experts, advises China's military and defense-industrial leaders on military modernization issues and on opportunities to develop emerging technologies.
- > The CMC, in 2016, established the S&T Commission, a high-level defense research body, as an independent organization under the high command. It also emphasized Civil-Military Integration (CMI), a phrase used in part to refer to the defense and commercial industrial sectors sharing or combining resources to develop dual-use technologies, policies, and organizations for mutual benefit but with a particular emphasis on assimilating private sector innovation into the defense industrial base. The 2017 establishment of a Central Commission for Integrated Military and Civilian Development, responsible for overseeing CMI efforts, underscores the importance China assigns to this initiative.

- > In early 2017, the PLA set up a Scientific Research Steering Committee, which falls directly under the CMC, consisting of scientists and engineers that have experience with cutting-edge technologies. Along with the CMC S&T Commission, the committee will spearhead S&T innovation by advising the CMC on early-stage research projects.
- > In July 2017, China reorganized the three top PLA academic institutes – the PLA Academy of Military Science (AMS), the National Defense University, and the National University of Defense Technology – as part of its PLA reform initiative. With the new structure, the AMS will focus on scientific research related to military affairs, facilitating closer ties between military theory and S&T development.

In 2016, China adopted its 13th Five-Year Plan (2016–2020) which, among other things, sets focus areas for R&D and innovation. Many of the focus areas featured have defense implications, such as aerospace engines – including turbofan technology – and gas turbines; quantum communications and computing; innovative electronics and software; automation and robotics; special materials and applications; nanotechnology; neuroscience, neural research, and AI; and deep space exploration and on-orbit servicing and maintenance systems. China also is concentrating substantial R&D resources on nuclear fusion, hypersonic technology, and the

deployment and hardening of an expanding constellation of multipurpose satellites.

Two of the most influential proponents in promoting and enforcing China's RDAT&P, S&T, and CMI initiatives are the State Administration for Science, Technology and Industry for National Defense and the CMC's Equipment Development Department (EDD), which work together to monitor and guide the state and military sides of China's defense-industrial apparatus, respectively. The EDD and its military service counterparts cooperate with China's 10 state-owned defense industrial corporations through a network of military representative bureaus and offices to supervise quality control and defense contract compliance. In 2018, the United States announced sanctions against the EDD related to purchases of military equipment from Russia and imposed pursuant to the Countering America's Adversaries Through Sanctions Act (CAATSA).

The National Science Foundation of China (NSFC), the China Academy of Sciences (CAS), and the Ministry of Science and Technology (MOST) are key to S&T decision-making, funding and promoting basic and applied research, scientific innovation, and high-tech integration throughout China's scientific, engineering, and civil-military industrial complex. CAS, working closely with NSFC, is the highest academic institution for comprehensive R&D in the natural and applied sciences in China and reports directly to the State Council in an advisory capacity,

# OSD on China's Rising Military Technology and Industrial Base - II

## MILITARY EQUIPMENT MODERNIZATION TRENDS

### Key Takeaways

- > Many of China's missile programs are comparable to other top-tier producers, and China can use aspects of the S-400 SAM system it began receiving from Russia in 2018 to reverse-engineer capabilities it lacks.
- > China is the top ship-producing nation in the world by tonnage, with the capability to domestically produce naval gas turbine and diesel engines as well as shipboard weapons and electronic systems, making it nearly self-sufficient for all shipbuilding components.

**Missile and Space Industry.** Most of China's missile programs, including its ballistic and cruise missile systems, are comparable in quality to other international top-tier producers. China produces a wide range of ballistic, cruise, air-to-air, and surface-to-air missiles (SAMs) for the PLA and for export, which has enhanced its primary assembly and solid-propellant rocket motor production facilities.

China received the first S-400 SAM system it purchased from Russia in April 2018. China can use aspects of the S-400 to reverse-engineer capabilities it lacks. China's space industry is rapidly expanding its ISR, navigation, and communication satellite constellations and making substantial strides in space lift capabilities, human spaceflight, and lunar exploration programs. China is looking to expand its space launch vehicle industry to support commercial launches and make rapid satellite launch services available to foreign customers. China is planning to launch, assemble in-orbit, and operate a crewed Chinese space station before 2025.

**Naval and Shipbuilding Industry.** China is the top ship-producing nation in the world by tonnage, increasing its shipbuilding capacity and capability for all naval classes, including submarines and surface combatants as well as lift and amphibious ships. China's two largest state-owned shipbuilders – the China State Shipbuilding Corporation and the China Shipbuilding Industry Corporation – collaborate on ship designs and construction to increase shipbuilding efficiency. China produces its naval gas turbine and diesel engines domestically – as well as almost all shipboard weapons and electronic systems – making it nearly self-sufficient for all shipbuilding components.

**Armaments Industry.** China's production capacity is advancing in nearly every category of PLA ground systems, including armored personnel carriers, assault vehicles, air defense

artillery systems, artillery systems and pieces, and main and light battle tanks. Notably, China began testing unmanned Type-59 tanks in November 2018. China can produce ground weapon systems at or near world-class standards; however, quality deficiencies persist with some exported equipment, which is limiting China's ability to broadly expand export markets.

**Aviation Industry.** China's aviation industry has produced large transport aircraft, modern fourth- and fifth-generation fighters incorporating low-observable technologies, modern reconnaissance and attack UAVs, and attack helicopters. China's commercial aircraft industry has invested in high-tech machine tooling and production processes to develop avionics and other components needed to produce military aircraft. However, even with heavy investment in its aero-engine industry, China's military and commercial aircraft industry remains reliant on foreign-sourced components for dependable, proven, and high-performance aircraft engines as exemplified in China's decision in May 2018 to build its commercial C919 airliner with France's CFM International Leap 1C engine. China is developing the CJ-1000AX high-bypass turbofan to power the C919 and aims to have it enter service in 2021. China's ability to produce commercial and military aircraft is improving because of China's ongoing investment in the domestic ARJ21, C919, and CRJ929 wide-body commercial airliners and the Y-20 large transport program.

## SCIENCE AND TECHNOLOGY GOALS IN SUPPORT OF MILITARY MODERNIZATION

### Key Takeaways

- > China's 13th Five-Year Plan calls for accelerating research on "majority influential disruptive technologies" and the pursuit of "leapfrog" S&T developments in order to win "a competitive advantage in the new round of industry transformation."
- > China has mobilized vast resources to fund research and subsidize companies involved in strategic S&T fields while pressing private firms, universities, and provincial governments to cooperate with the military in developing advanced technologies.
- > China is pursuing a number of advanced military capabilities with disruptive potential such as hypersonic weapons, electromagnetic railguns, directed energy weapons, and counterspace capabilities.

**State Plans.** China has issued an array of major national plans over the last decade that stress indigenous innovation and the rapid development of strategic S&T sectors, such as information and communications technology, high end manufacturing, alternative energy, and biotechnology. China's 13th Five-Year Plan calls for accelerating research on "majority influential disruptive technologies" and the pursuit of "leapfrog" S&T developments in



# OSD on China's Rising Military Technology and Industrial Base - III

order to win "a competitive advantage in the new round of industry transformation." China has increasingly funded basic research and made comprehensive efforts to grow the country's inventive capabilities over the last decade.

- > The 2017 National Artificial Intelligence Plan describes steps for China to become the "world's major AI innovation center" by 2030 and calls for the country to accelerate the integration of AI with the economy, society, and national defense. The plan foresees a great expansion in the "breadth and depth of AI applications in... national defense construction."
- > Other plans address the development of various sectors of China's robust Internet ecosystem to include cloud computing, the big data industry, e-commerce, and next-generation broadband wireless communications networks, including fifth-generation (5G) wireless networks. Due to information-sharing requirements with Chinese security services as stipulated in Chinese laws, worldwide expansion of Chinese-made equipment in 5G networks will challenge the security and resiliency of other countries' networks.

China continues to execute "Made in China 2025," an ambitious industrial masterplan centered around "smart manufacturing" that aims to create a vanguard of Chinese corporations that are global leaders in these 10 strategic industries: new generation

information technology, high-grade machine tooling and robotics, aerospace equipment; marine engineering equipment and high-tech ships; advanced rail transportation equipment; new-energy automobiles, electric power equipment; agricultural equipment; new materials; and biomedicine and high-tech medical devices. The plan stresses the need to replace imported technology with domestically produced technology, a goal that corresponds with China's desire to reduce its reliance on other nations and develop a fully indigenous defense sector. In addition to presenting an economic challenge to nations that export high-tech products, the plan directly supports China's military modernization goals by stressing proprietary mastery of advanced dual-use technologies. China's leaders have softened their rhetoric regarding "Made in China 2025" in response to concerns that advanced industrial countries have regarding Chinese theft and illicit acquisition of sensitive intellectual property pursuant to that policy.

**Heavy Government and Corporate Sector Investment.** China has mobilized vast resources to fund research and subsidize companies involved in strategic S&T fields while pressing private firms, universities, and provincial governments to cooperate with the military in developing advanced technologies. Although China remains reliant on certain types of foreign technology, the country's decades-long execution of a strategy of advancing domestic S&T R&D through large-scale technology transfer has deepened the

expertise of Chinese scientists and engineers and placed them at, or near, the forefront of many scientific fields.

- > Chinese state investment funds established to support priority industries have marshalled an estimated hundreds of billions of dollars in capital.
- > China expects to field an exascale computer based on domestically produced technology by 2020, ahead of the United States, the European Union, and Japan.
- > China conducted the first quantum-secured intercontinental videoconference in September 2017 and plans to have a satellite-enabled, global quantum-encrypted communications capability operational by 2030. China is also reportedly building the world's largest quantum research facility slated to open in the city of Hefei in 2020.
- > In January 2018, scientists from CAS reported they had broken a technological barrier by successfully cloning primates.

China's private sector, led by Internet companies Baidu, Alibaba, and Tencent (BATs) and telecommunications equipment manufacturers Huawei and ZTE, is driving the development of emerging technologies, such as facial recognition and 5G, by establishing innovation centers and funding technology startups, or in the case of 5G, competing to build the world's next-generation networks. Chinese technology companies are also

expanding into overseas markets, in some cases, by offering smart-city technologies, a development that could increase their access to foreign talent and data.

- > In 2018, Tencent and Alibaba made intensive investments in the Chinese robotics start-up UBTECH and the AI startup SenseTime, respectively.
- > In November 2017, the Chinese start-up Yitu won a U.S. government-sponsored competition involving facial recognition technology. Yitu, along with other Chinese AI and facial recognition firms like SenseTime, Megvii, and DeepGlint, reportedly received hundreds of millions of dollars in investments in 2017. China is the world's largest market for video surveillance technologies.
- > The 2017 *National Intelligence Law* requires Chinese companies, such as Huawei and ZTE, to support, provide assistance, and cooperate in China's national intelligence work, wherever they operate.

**Potential Military Applications.** China is pursuing a number of advanced military capabilities with disruptive potential such as hypersonic weapons, electromagnetic railguns, directed energy weapons, and counterspace capabilities. The country's effort to build national corporate champions that achieve rapid market dominance across a range of frontier technologies directly complements the PLA's modernization efforts and carries

serious military implications. Given China's willingness to deploy emerging technologies rapidly and at massive scale as well as China's focus on CMI, the PLA would likely quickly benefit from any Chinese scientific breakthroughs with military utility. Potential military applications of some emerging technologies include:

- > *AI and Advanced Robotics:* enhanced forecasting, manufacturing, C4ISR, and surveillance technology, unmanned systems, human-machine teaming, swarming technology, and lethal autonomous weapons.
- > *Semiconductors and Advanced Computing:* enhanced cyber operations and weapons design, and shortened R&D cycles.
- > *Quantum Technologies:* secure global communications, enhanced computing and decryption capabilities, detection of stealth platforms, and enhanced submarine navigation.
- > *Hypersonic and Directed Energy Weapons:* global strike and defeat of missile defense systems, and anti-satellite, anti-missile, and anti-unmanned aircraft system capabilities.
- > *Advanced Materials and Alternative Energy:* improved military equipment and weapon systems.

# OSD on Chinese Technology Espionage

## FOREIGN TECHNOLOGY ACQUISITION

### Key Takeaways

- > China is investing in the critical technologies that will be foundational for future innovations, both for commercial and military applications.
- > In 2018, Chinese espionage efforts to acquire sensitive, dual-use, or military-grade equipment included dynamic random access memory, aviation technologies, and anti-submarine warfare technologies.

In 2018, China continued to supplement indigenous military modernization efforts through the acquisition of foreign technologies and know-how. China is actively pursuing an intensive campaign to obtain foreign technology through imports, foreign direct investment, industrial and cyberespionage, and establishment of foreign R&D centers. China is investing in the critical technologies that will be foundational for future innovations both for commercial and military applications: AI, robotics, autonomous vehicles, quantum information sciences, augmented and virtual reality, financial technology, and gene editing. The line demarcating products designed for commercial versus military purposes is blurring with these new technologies. China's legal acquisition efforts supplement its military-industrial base through methods and practices, which include:

- > *Imports:* China acquires dual-use, export controlled technology by applying for licenses through the U.S. Department of Commerce. The majority of China's imports have traditionally been electronic and materials processing and test, inspection, and production equipment.
- > *Foreign Direct Investment:* China actively invests in or outright purchases foreign companies that have technology, facilities, and people working in key technology areas.
- > *Talent Recruitment:* China uses various incentive strategies to attract foreign personnel to work on and manage strategic programs and fill technical knowledge gaps, including the "Thousand Talents Program," which prioritizes recruiting people of Chinese descent or recent Chinese emigrants whose recruitment the Chinese government views as necessary to Chinese scientific and technical modernization, especially with regard to defense technology.
- > *Research and Development Centers:* China actively seeks partnerships with private, government, and academic research labs to gain exposure to cutting-edge technology and researchers. These partnerships also provide the technical know-how to run, manage, and organize such facilities.

## ESPIONAGE ACTIVITIES SUPPORTING CHINA'S MILITARY MODERNIZATION.

Multiple U.S. criminal indictments since 2015 involve Chinese nationals, non-ethnic Chinese U.S. citizens, and naturalized Chinese U.S. citizens or permanent resident aliens procuring and exporting controlled items to China, according to a U.S. Department of Justice summary of major U.S. export enforcement, economic espionage, and sanctions-related criminal cases. Chinese efforts to acquire sensitive, dual-use, or military-grade equipment included radiation hardened integrated circuits, monolithic microwave integrated circuits, accelerometers, gyroscopes, naval and marine technologies, syntactic foam trade secrets, space communications, military communication jamming equipment, dynamic random access memory, aviation technologies, and anti-submarine warfare.

- > In November 2018, a Chinese national residing in the United States was charged with conspiring to export devices with military applications to Chinese government and military actors. The Chinese national fulfilled instructions from the Chinese military to obtain dual-use technology used for anti-submarine warfare and other advanced military capabilities. This included remotely operated side scan sonar systems, hydrophones, robotic boats, unmanned

underwater vehicles, and unmanned surface vehicles.

- > In October 2018, a group of Chinese Ministry of State Security (MSS) intelligence officers, associated cyber actors, and other co-conspirators were indicted on charges of conspiring to steal sensitive technological information related to turbofan engines used in commercial airliners. At the time of the intrusions, a Chinese state-owned enterprise was developing a comparable engine for use in commercial aircraft manufactured in China and elsewhere.
- > In October 2018, a Chinese MSS officer was arrested and charged with economic espionage involving the theft of trade secrets for civilian and military aircraft technology related to engineering services and signature material, advanced communication systems, jet engines and aircraft propulsion, and engine containment structures from leading U.S. aviation firms. In addition, the officer targeted industry experts for recruitment by facilitating travel to China under the guise of delivering university presentations.

The intelligence officer also provided monetary compensation and other forms of reimbursement to these experts.

- > In September 2018, a Chinese state-owned enterprise was implicated in a conspiracy to commit economic espionage through the theft, conveyance, and possession of stolen trade secrets from a U.S. semiconductor company. The U.S. company is a global leader in the semiconductor industry and specializes in dynamic random-access memory (DRAM). China identifies DRAM development as a national priority.
- > Also in September 2018, a Chinese national was charged for acting within the United States as an illegal agent of the Chinese government. The MSS tasked the Chinese national with providing biographical data on individuals for recruitment, including Chinese nationals working in the United States as engineers and scientists (some as defense contractors). The Chinese national entered the United States on a student visa to study electrical engineering and enlisted in the U.S. Army Reserves under the Military Accessions Vital to the National Interest program.

# China's Shifting Balance of Arms Imports and Exports

# China's Shifting Balance of Arms Exports

China's balance of arms exports reflects a rise in its exports of less advanced arms – along with exports of some arms where China already has advanced designs – and Chinese imports of more advanced weapons and technology from states like the U.S. and Russia. At the same time, such data present a number of problems. China has one of the most advanced systems of industrial and defense technology espionage in the world, and these imports do not show up in estimates of its arms trade. The sale or transfer of arms to friendly states and non-state actors has also long been a form of hybrid warfare, and the arms trade is often as much a matter of strategic influence or proxy warfare as one of seeking economic advantage.

More generally, estimates of the trends in arms exports are even more uncertain than estimates of military spending. Many reported arms deals never actually take place, or materialize in radically different ways over a period of a year from the announced “deal.” Other sales or transfer take place with little or no notice, are covert, or are provided in the form of aid or preferential terms. As a result, efforts to convert them into current dollars are often largely guesstimates, and efforts to convert them into constant dollars ignore the reality of payments and “life cycles” for the deal that can extend over more than a decade.

These problems are compounded by the fact that past U.S. government reporting of declassified estimates through the CRS and to the IISS have become highly sporadic, and have not been updated since 2016. The commercial services that attempt to estimate such data are unreliable, and think tanks and research centers are limited in resources and have no access to intelligence data. Moreover, arms transfer estimates do not take account of espionage and stolen technology – key factors in China's efforts to improve its forces and military industrial-technology base.

That said, it is still clear from data provided by sources like the U.S. government and SIPRI that China remains a major importer of weapons and military technology, and is dependent on Russia for a range of imports of jet engine, missile, sensor, and other military systems – although this dependence is steadily dropping over time, and will probably end well within the next decade.

It is also clear that China's vastly expanded military industrial base already makes it a major arms exporter to developing states, particularly in Asia, and gives it considerable strategic leverage. China now imports the advanced systems necessary to support its effort to achieve parity and a lead in military weapons and systems while it earns influence by exporting less sophisticated weapons.

Here, SIPRI provides a good summary of the key trends in China's overt arms trade, although the numbers are uncertain and SIPRI does not comment on Chinese technology and industrial espionage and theft:

Whereas Chinese arms exports rose by 195 percent between 2004–2008 and 2009–13, they increased by only 2.7 percent between 2009–13 and 2014–18. In 2014–18 Asia and Oceania accounted for 70 percent of Chinese arms exports, Africa for 20 percent and the Middle East for 6.1 percent.

The number of countries to which China delivers major arms has grown significantly over the past few years. In 2014–18 China delivered major arms to 53 countries, compared with 41 in 2009–13 and 32 in 2004–2008. Pakistan was the main recipient (37 percent) in 2014–18, as it has been for all five-year periods since 1991. China supplied relatively small volumes of major arms to a wide variety of countries: 39 of the 53 recipients in 2014–18 each accounted for less than 1 percent of total Chinese arms exports.

China's arms exports are limited by the fact that many countries—including 4 of the top 10 arms importers in 2014–18 (India, Australia, South Korea and Vietnam)—will not procure Chinese arms for political reasons. Nonetheless, improvements in Chinese military technology have opened up opportunities for arms export growth, including exports to new customers. In 2014–18 China became the largest exporter in the niche market of unmanned combat aerial vehicles (UCAVs), with states.



# OSD on Chinese Arms Exports in 2019

In 2018, China's arms sales increased, continuing a trend that enabled China to become the world's fastest-growing arms supplier during the past 15 years. From 2013 through 2017, China was the world's fourth-largest arms supplier, completing more than \$25 billion worth of arms sales. China sold military equipment worth more than \$10 billion to the Middle East. Saudi Arabia, Iraq, and the United Arab Emirates accounted for most of China's arms sales in the region. The Indo-Pacific region was China's second-largest regional arms market, with more than \$8 billion worth of arms sales, more than \$5 billion of which was to Pakistan. Contracts signed within the past few years for guided rockets, ballistic missiles, armed UAVs, submarines, and surface warships sustained sales growth for Chinese arms exporters. The Aviation Industry of China (AVIC), an exporter of armed UAVs and fixed-wing aircraft, claimed in a rare public statement that it secured record profits in 2017, illustrating China's rising profile among the world's most prolific arms suppliers. China's ability to remain among the world's top five global arms suppliers largely hinges on continued strong sales to key Middle East and Indo-Pacific customers, as well as sustained demand for its armed UAVs and precision-strike weapons.

- **Armed UAVs.** China's market for armed UAVs continues to grow; China now sells CAIHONG series UAVs to at least Burma, Iraq, Pakistan, Saudi Arabia, and the United Arab Emirates. China faces little competition for these sales; most armed UAV exporters have signed the Missile Technology Control Regime and/or the Wassenaar Arrangement on Export Controls for Conventional Arms and Dual-Use Goods and Technologies and face sales restrictions.
- **Precision-Strike Weapons.** Filling another niche in the global arms market, China has sold precision-guided rockets and ballistic missile systems, though it typically does not identify countries purchasing these types of arms. Industry reports in 2018 highlighted sales of Chinese-made WS-3A and WS-22 satellite-guided rockets, as well as several export variant ballistic missile systems (the M20, BP-12, and Joint Attack Rocket and Missile systems).
- **Naval Combatants.** China's naval warship sales have also surged since 2015, highlighted by Pakistan's purchase of eight YUAN variant submarines for more than \$3 billion. Thailand also purchased one YUAN variant submarine in 2017 and has expressed interest in purchasing two more. To date, China has not delivered any YUAN variants, though it delivered two MING-class submarines to Bangladesh in 2016. Also, in 2017 and 2018, China sold frigates to Bangladesh (two Type 053H3s) and Pakistan (four Type 054As), and donated one unspecified frigate to Sri Lanka.

China's arms sales operate through state-run export organizations such as AVIC and North Industries Corporation (NORINCO) that primarily seek to generate profits. Arms transfers also are a component of China's foreign policy, used in conjunction with other types of military, economic aid, and development assistance to support broader foreign policy goals. These include securing access to natural resources and export markets, promoting political influence among host country elites, and building support in international forums.

Many of China's arms recipients are developing countries that tend to buy Chinese arms because they are less expensive than comparable systems sold by other arms manufactures. Although Chinese arms are considered by some potential customers to be of lower quality and reliability, many Chinese systems are offered with enticements such as gifts, donations, and flexible payment options. Some Chinese systems include advanced capabilities. Chinese arms also tend to carry fewer end-use restrictions and are monitored less rigorously than competitors' arms exports, a factor that attracts customers with less access to other sources of military equipment because of political or economic reasons.

# DoD on Chinese Arms Sales 9.2018

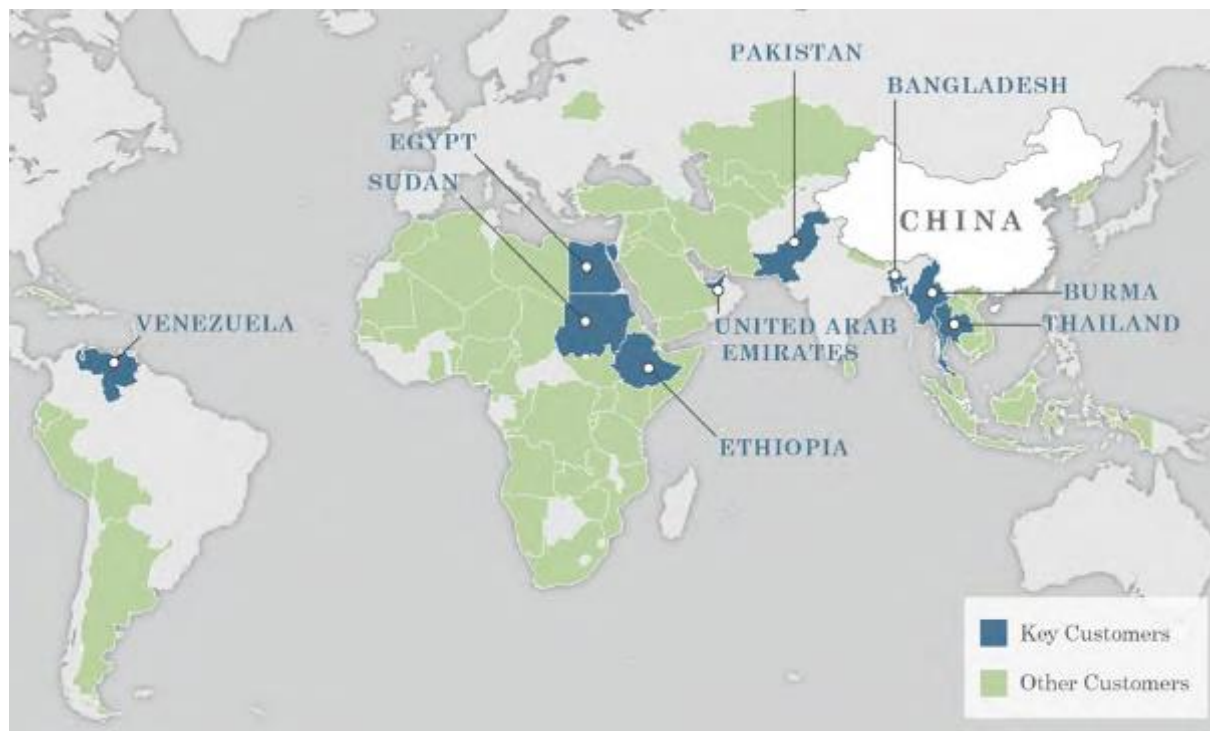
**Arms Sales.** China's arms sales are conducted via state-run organizations that primarily seek to generate profits and offset defense-related research and development costs. Arms transfers are also a component of China's foreign policy, used in conjunction with other military cooperation, economic aid, and development assistance to support broader foreign policy goals. These include securing access to natural resources and export markets, promoting political influence among host country elites, and building support in international forums.

Between 2012 and 2016, China was the fifth largest arms supplier in the world, completing more than \$20 billion in sales including \$8 billion in military equipment sales to Indo-Pacific countries, primarily to Pakistan (many funded via loans), Bangladesh, and Burma. China's second largest arms sales were to the Middle East and North Africa, likely due to the demand for armed UAVs – a niche market where China is one of the world's few suppliers. China's ability to remain among the top five global arms suppliers largely hinges on continued strong sales to Pakistan and demand for its armed UAVs.

Chinese arms are lower quality and less reliable than those offered by the top international arms suppliers, but many have advanced capabilities. Most of China's customers are developing countries that prefer less expensive Chinese arms. These arms generally come with few end-use restrictions, which is attractive to customers who may not have access to other arms sources for political or economic reasons. Key developments and examples include the following:

- Submarines are becoming a more prominent Chinese export to countries along China's periphery. In 2015, China signed an agreement to sell Pakistan eight YUAN-class submarines; the first four submarines will be built in China and the remaining four in Pakistan. China delivered two MING-class diesel attack submarines to Bangladesh in late-2016 and continues to market a variety of submarine options at international trade shows. In May 2017, China finalized a \$390 million contract with Thailand for one Chinese-built S26T diesel-electric submarine to be delivered in 2023.
- China has sold armed UAVs to several Middle East and North African states, including Iraq, Saudi Arabia, Egypt, and the United Arab Emirates. China faces little competition for sale of such systems, as most countries that produce armed UAVs are restricted from selling the technology as signatories of the Missile Technology Control Regime and/or the Wassenaar Arrangement on Export Controls for Conventional Arms and Dual-Use Goods and Technologies.
- In March 2018, state-owned China Shipbuilding Industry Corporation (CSIC) signed an MOU with the Royal Thai Armed Forces to collaborate on unspecified military equipment and technologies. CSIC claimed the deal contributed to Xi Jinping's "going out" strategy to expand China's defense industry presence in key foreign markets.
- In June 2018, China finalized contracts with Pakistan and Bangladesh for conventional arms. The Pakistan contract is for delivery of two Type 054A multi-role frigates valued at \$500 million, which Pakistan anticipates receiving before 2021. The Bangladesh contract is reportedly valued at more than \$200 million for the sale of an additional 23 K-8W intermediate jet trainers. Bangladesh currently operates K-8W aircraft it bought from China in 2014.
- In July 2018, China's defense attaché announced Beijing would donate a frigate to the Sri Lankan Navy. The donation came three weeks after the Lankan Navy announced its plan to shift its Southern Command HQ to Hambantota Port to reinforce sovereignty over the port, which the PRC for 99 years and a Chinese state-owned enterprise owns and operates. The PLA is also constructing facilities at the Sri Lankan military academy.

# DIA on Chinese Arms Sales in 2019



Algeria	Congo, Republic of	Kuwait	North Korea	Timor-Leste
Angola	Cuba	Laos	Peru	Turkey
Argentina	Djibouti	Lebanon	Qatar	Turkmenistan
Belarus	Ecuador	Libya	Rwanda	Uganda
Benin	Equatorial Guinea	Malaysia	Saudi Arabia	Uzbekistan
Bolivia	Eritrea	Mali	Senegal	Vietnam
Burundi	Ghana	Mauritania	Seychelles	Yemen
Cambodia	Indonesia	Morocco	Somalia	Zambia
Cameroon	Iran	Mozambique	South Africa	Zimbabwe
Chad	Iraq	Namibia	South Sudan	
Congo, Democratic Republic of	Jordan	Nepal	Sri Lanka	
	Kazakhstan	Niger	Syria	
	Kenya	Nigeria	Tanzania	

Over 65 countries have been recipients of Chinese arms since 2002.

Source: Office of the Secretary of Defense, Military and Security Developments Involving the Republic of China, Annual Report to Congress, May 16, 2018, Department of Defense. China Military Power 2018, pp. 105-106

# CRS Summary of China's Status as An Arms Exporter and Importer in 2016 - I

## China

It was not until the Iran-Iraq war in the 1980s that China became an important arms supplier, one willing and able to provide weaponry when other major suppliers withheld sales to both belligerents. During that conflict, China demonstrated that it was willing to provide arms to both combatants in quantity and without conditions. Subsequently, China's arms sales have been more regional and targeted in the developing world. From 2012 to 2015, the value of China's arms transfer agreements with developing nations has averaged over \$4 billion annually. During the period of this report, the value of China's arms transfer agreements with developing nations was highest in 2015 at \$6 billion (in current dollars). China's arms agreements total in 2014 was \$3.3 billion. China's totals can be attributed, in part, to continuing contracts with Pakistan, a key historic client. More broadly, China's sales figures reflect several smaller valued weapons deals in Asia, Africa, and the Near East, rather than especially large agreements for major weapon systems. Comparatively, few developing nations with significant financial resources have purchased Chinese military equipment during the eight-year period of this report. Most Chinese weapons for export are less advanced and sophisticated than weaponry available from Western suppliers or Russia. China, consequently, does not appear likely to be a key supplier of major conventional weapons in the developing world arms market in the immediate future. That said, China has indicated that increasingly it views foreign arms sales as an important market in which it wishes to compete, and has increased the promotion of its more advanced aircraft in an effort to secure contracts from developing countries. China's weapon systems for export seem based upon designs obtained from Russia through previous licensed production programs. Nonetheless, China's likely client base will be states in Asia and Africa seeking quantities of small arms and light weapons, rather than major combat systems.

China has also been an important source of missiles to some developing countries. For example, China has supplied battlefield and cruise missiles to Iran and surface-to-surface missiles to Pakistan. According to U.S. officials, the Chinese government no longer supplies other countries with complete missile systems. However, Chinese entities are suppliers of missile-related technology. Such activity raises questions about China's willingness to fulfill the government's stated commitment to act in accordance with the restrictions on missile transfers set out in the Missile Technology Control Regime (MTCR) and how its interpretation of MTCR guidelines differs from other member states. Because China has military products—particularly its missiles—that some developing countries would like to acquire, it can present an obstacle to efforts to stem proliferation of advanced missile systems to some areas of the developing world.

China continues to be the source of a variety of small arms and light weapons transferred to African states. The prospects for significant revenue earnings from these arms sales are limited. China likely views such sales as one means of enhancing its status as an international political power, and increasing its ability to obtain access to significant natural resources, especially oil. The control of sales of small arms and light weapons to regions of conflict, especially to some African nations, has been a matter of concern to the United States and others. The United Nations also has undertaken an examination of this issue in an effort to achieve consensus on a path to curtail this weapons trade comprehensively. During July 2012, the United Nations attempted to reach agreement on the text of an Arms Trade Treaty (ATT), aimed at setting agreed standards for member states regarding what types of conventional arms sales should be made internationally, and what criteria should be applied in making arms transfer decisions. At the end of the month-long period, set aside for negotiations, this effort failed to achieve the necessary consensus on a treaty draft. China, while not a member of the group of U.N. states negotiating the final draft, made it publicly clear that it did not support any treaty that would prevent any state from making its own, independent, national decision to make an arms sale.<sup>5</sup> The U.N. adopted the treaty as a resolution following a vote on April 2, 2013; China and Russia abstained. The treaty entered into force on December 24, 2014. To date, 78 states have ratified the treaty, with the United States as a signatory. President Obama transmitted the treaty to the Senate for its advice and consent on December 9, 2016.

## Asia

The data on regional arms-transfer agreements from 2008 to 2015 indicate that Asia, after the Near East, is the second largest region of the developing world for orders of conventional weaponry. Throughout Asia, several developing nations have been upgrading and modernizing their defense forces, and this has led to new conventional weapons sales in that region. Beginning in the mid-1990s, Russia became the principal supplier of advanced conventional weaponry to China for about a decade—selling it fighters, submarines,

# CRS Summary of China's Status as An Arms Exporter and Importer in 2016 - II

destroyers, and missiles—while establishing itself as the principal arms supplier to India. Russian arms sales to these two countries have been primarily responsible for much of the increase in Asia's overall share of the arms market in the developing world during much of the period of this report. Russia has also expanded its client base in Asia, securing aircraft orders from Malaysia, Vietnam, Burma, and Indonesia. It is notable that India, while the principal Russian arms customer, during recent years has sought to diversify its weapons supplier base, purchasing the Phalcon early warning defense system aircraft in 2004 from Israel and numerous items from France in 2005, in particular six Scorpene diesel attack submarines. In 2008 India purchased six C130J cargo aircraft from the United States. In 2010, the United Kingdom sold India 57 Hawk jet trainers for \$1 billion. In 2010 Italy also sold India 12 AW101 helicopters. In 2011, France secured a \$2.4 billion contract with India to upgrade 51 of its Mirage-2000 combat fighters, and the United States agreed to sell India 10 C-17 Globemaster III aircraft for \$4.1 billion. This pattern of Indian arms purchases indicates that Russia will likely face strong new competition from other major weapons suppliers for the India arms market, and it can no longer be assured that India will consistently purchase its major combat systems. Indeed, India in 2011 had eliminated Russia from the international competition to supply a new-generation combat fighter aircraft, a competition won by France. In 2015 Russia and India agreed to a contract in which India would procure at least 200 Ka-226T helicopters.

Asia has over time been the second-largest developing-world arms market. In 2012-2015, Asia ranked second, accounting for 31.3% of the total value of all arms transfer agreements with developing nations (\$72.2 billion in current dollars). In the earlier period, 2008-2011, the Asia region ranked second, accounting for 28.8% of all such agreements (\$61 billion in current dollars)

In the earlier period (2008-2011), the United States ranked first in the value of arms transfer agreements with Asia with 27.53% (\$16.8 billion in current dollars). Russia made 26.23% of this region's agreements in 2008-2011. The major Western European suppliers, as a group, made 17% of this region's agreements. In the later period (2012-2015), the United States ranked first in Asian agreements with 36.53% (\$26.4 billion in current dollars); Russia ranked second with 24.53% (\$17.7 billion in current dollars). The major West European suppliers, as a group, made 16.9% of this region's agreements in 2012-2015.

# Continuing Dependence on Outside Powers: Chinese Arms Imports by Supplier Country in 2010-2018

(In Comparative SIPRI Trend Indicator Values (TIVs) in Millions – Not Currency)

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Total
Belarus														170						170
France	91	108	145	131	223	177	142	149	160	128	152	167	182	182	148	160	117	98	84	2744
Germany	8	8	6	8	16	16	12	10	3	3	3	3	3	11	9	12	5	8	17	162
Israel	28	28																		55
Russia	2231	2500	2541	2076	2887	3156	2465	1316	1514	1087	744	796	724	788	705	742	636	909	1304	29120
Switzerland	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	33	33	1170
Ukraine	29	41	58	3	33	82	128	64	54	28			632	86	140	86	90	103	108	1763
United Kingdom	70	70	60	60	60	70	50	50	60	70	70	70	70	70	70	70	60	40	20	1160
Uzbekistan																34	68			102
Total	2521	2819	2875	2342	3284	3566	2862	1654	1856	1381	1034	1102	1675	1372	1137	1169	1041	1190	1566	36445

Source: Stockholm International Peace Research Institute (SIPRI) [http://armstrade.sipri.org/armstrade/html/export\\_values.php](http://armstrade.sipri.org/armstrade/html/export_values.php), June 17, 2019; for full definition and details see SIPRI, <http://sipri.org/databases/armstransfers/sources-and-methods/>



## Continuing Dependence on Outside Powers: Total Chinese Arms Imports by Major Weapons Category in 2010-2018

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Total
Aircraft	1287	2440	2306	1884	2183	860	941	683	189	297	473	536	257	526	368	513	527	642	626	17539
Air defense systems	265	15	15	109	109	15	15	235	455	235	15	15	15	15	15	15	15	8	268	1848
Artillery	1																			1
Engines	65	82	89	107	244	184	143	162	199	181	273	309	462	479	501	349	298	288	283	4698
Missiles	321	165	324	150	290	529	654	487	825	617	120	120	120	120	120	92	28	48	275	5401
Naval weapons					30		20	23	10		8	8	13	28	25	23	28	25	25	263
Sensors	82	117	141	93	169	178	69	64	178	50	146	114	178	146	50	178	146	121	89	2308
Ships	500				260	1800	1020						632	59	59			59		4388
Total	2521	2819	2875	2342	3284	3566	2862	1654	1856	1381	1034	1102	1675	1372	1137	1169	1041	1190	1566	36445

Source: Stockholm International Peace Research Institute (SIPRI) [http://armstrade.sipri.org/armstrade/html/export\\_values.php](http://armstrade.sipri.org/armstrade/html/export_values.php), June 17, 2019; for full definition and details see SIPRI, <http://sipri.org/databases/armstransfers/sources-and-methods/>

# U.S. Government Estimate of China's Role in Global Arms Exports: 2008-2016

**Figure 2. Arms Transfer Agreements Worldwide**  
(supplier percentage of value)



Source: U.S. government.

**Figure 3. Arms Transfer Agreements With Developing Nations**  
(supplier percentage of value)



Source: U.S. government.

**Table 1. Worldwide Arms Transfer Agreements, 2008-2015 and Suppliers' Share with Developing World**  
(in millions of current 2015 U.S. dollars)

Supplier	Worldwide Agreements Value 2008-2011	Percentage of Total with Developing World
United States	139,437	79.71%
Russia	36,000	91.11%
France	23,200	92.67%
United Kingdom	4,000	70.00%
China	10,500	99.05%
Germany	9,600	56.25%
Italy	8,900	56.18%
All Other European	20,400	70.59%
All Others	14,600	74.66%
<b>TOTAL</b>	<b>266,637</b>	<b>80.39%</b>

Supplier	Worldwide Agreements Value 2012-2015	Percentage of Total with Developing World
United States	126,034	67.95%
Russia	52,500	92.57%
France	29,200	94.86%
United Kingdom	10,800	96.30%
China	17,100	100.00%
Germany	15,900	81.76%
Italy	5,500	81.82%
All Other European	42,200	86.97%
All Others	17,800	72.47%
<b>TOTAL</b>	<b>317,034</b>	<b>80.92%</b>

Source: *Conventional Arms Transfers to Developing Nations, 2007-2014*, Congressional Research Service, 12.19.16, <https://www.google.com/search?client=firefox-b-1-d&q=conventional+arms+transfers+to+developing+nations>, p. 20

# U.S. Government Estimate of China's Sales by Year: 2008-2016

**Table 3. Arms Transfer Agreements with Developing Nations, by Supplier, 2008-2015**  
(in millions of current U.S. dollars)

	2008	2009	2010	2011	2012	2013	2014	2015	2008-2015
United States	27,200	13,119	14,695	56,131	11,331	17,835	29,735	26,743	194,264
Russia	5,400	14,900	6,800	5,700	16,700	10,700	10,200	11,000	81,400
France	5,600	9,300	1,900	4,700	3,100	3,800	5,600	15,200	49,200
United Kingdom	0	1,100	1,200	500	5,700	3,600	400	700	13,200
China	2,200	3,000	2,000	3,200	3,500	4,300	3,300	6,000	27,500
Germany	3,000	2,200	100	100	4,900	7,000	400	700	18,400
Italy	1,400	1,300	1,200	1,100	1,500	900	1,100	1,000	9,500
All Other European	4,100	4,600	2,800	2,900	5,800	3,600	24,400	2,900	51,100
All Others	2,000	4,200	1,500	3,200	3,000	4,700	4,200	1,000	23,800
<b>TOTAL</b>	<b>50,900</b>	<b>53,719</b>	<b>32,195</b>	<b>77,531</b>	<b>55,531</b>	<b>56,435</b>	<b>79,335</b>	<b>65,243</b>	<b>468,364</b>

**Table 14. Arms Deliveries to Developing Nations, by Supplier, 2008-2015**  
(in millions of current U.S. dollars)

	2008	2009	2010	2011	2012	2013	2014	2015	2008-2015
United States	7,354	7,352	8,402	9,912	10,330	10,589	12,184	11,904	78,028
Russia	6,400	5,400	6,700	8,400	9,600	9,700	9,400	6,200	61,800
France	800	700	1,700	1,200	2,200	2,900	2,600	6,200	18,300
United Kingdom	1,300	1,200	1,600	1,500	1,100	1,600	2,600	200	11,100
China	2,200	1,800	3,200	1,700	2,100	2,600	1,900	2,900	18,400
Germany	1,400	1,900	1,400	1,200	800	400	1,600	1,100	9,800
Italy	200	600	1,200	1,300	1,400	800	600	1,500	7,600
All Other European	2,300	2,500	3,200	4,700	3,200	3,300	2,900	2,400	24,500
All Others	1,000	1,800	2,000	2,200	1,700	1,300	2,400	1,200	165,100
<b>TOTAL</b>	<b>22,954</b>	<b>23,252</b>	<b>29,402</b>	<b>32,112</b>	<b>32,430</b>	<b>33,189</b>	<b>36,184</b>	<b>33,604</b>	<b>243,127</b>

Source: Catherine A. Theohary, *Conventional Arms Transfers to Developing Nations, 2007-2014*, Congressional Research Service, R44716, 12.19.16, <https://www.google.com/search?client=firefox-b-1-d&q=conventional+arms+transfers+to+developing+nations>, p. 31, 39

## U.S. Government Estimate of China's Weapons Export Deliveries: 2008-2016

Weapons Category	U.S.	Russia	China	Major West European*	All Other European	All Others
<b>2008-2011</b>						
Tanks and Self-Propelled Guns	348	630	490	360	550	50
Artillery	155	110	340	140	600	190
APCs and Armored Cars	188	570	620	420	1,630	580
Major Surface Combatants	0	2	3	5	5	4
Minor Surface Combatants	0	8	113	64	52	118
Guided Missile Boats	0	2	0	0	0	4
Submarines	0	2	0	4	1	0
Supersonic Combat Aircraft	58	170	30	40	130	50
Subsonic Combat Aircraft	0	0	20	50	20	80
Other Aircraft	62	20	130	50	160	40
Helicopters	35	270	20	150	70	50
Surface-to-Air Missiles	1,088	8,160	2,080	360	650	500
Surface-to-Surface Missiles	1,285	70	0	0	0	10
Anti-Ship Missiles	133	260	80	80	10	50
<b>2012-2015</b>						
Tanks and Self-Propelled Guns	76	430	130	80	390	10
Artillery	232	130	250	40	630	430
APCs and Armored Cars	1	680	760	960	920	460
Major Surface Combatants	0	3	6	13	2	4
Minor Surface Combatants	0	8	19	67	67	86
Guided Missile Boats	0	0	2	2	0	7
Submarines	0	4	0	8	0	2
Supersonic Combat Aircraft	45	100	20	20	20	40
Subsonic Combat Aircraft	0	0	0	20	10	30
Other Aircraft	35	20	50	130	260	50
Helicopters	2	280	40	140	30	50
Surface-to-Air Missiles	346	6,300	1,310	1,130	240	630
Surface-to-Surface Missiles	163	80	10	0	0	0
Anti-Ship Missiles	116	40	110	210	0	20

Source: *Conventional Arms Transfers to Developing Nations, 2007-2014*, Congressional Research Service, 12.19.16,  
<https://www.google.com/search?client=firefox-b-1-d&q=conventional+arms+transfers+to+developing+nations>, p. 50

# SIPRI Summary of China's Status as An Arms Exporter and Importer in 2019 - I

## Exporter

Whereas Chinese arms exports rose by 195 percent between 2004–2008 and 2009–13, they increased by only 2.7 percent between 2009–13 and 2014–18. In 2014–18 Asia and Oceania accounted for 70 percent of Chinese arms exports, Africa for 20 percent and the Middle East for 6.1 percent.

The number of countries to which China delivers major arms has grown significantly over the past few years. In 2014–18 China delivered major arms to 53 countries, compared with 41 in 2009–13 and 32 in 2004–2008.

Pakistan was the main recipient (37 percent) in 2014–18, as it has been for all five-year periods since 1991. China supplied relatively small volumes of major arms to a wide variety of countries: 39 of the 53 recipients in 2014–18 each accounted for less than 1 percent of total Chinese arms exports.

China's arms exports are limited by the fact that many countries—including 4 of the top 10 arms importers in 2014–18 (India, Australia, South Korea and Vietnam)—will not procure Chinese arms for political reasons.

Nonetheless, improvements in Chinese military technology have opened up opportunities for arms export growth, including exports to new customers. In 2014–18 China became the largest exporter in the niche market of unmanned combat aerial vehicles (UCAVs), with states in the Middle East among the main recipients.

## Importer

Despite the rapid development of its indigenous arms-producing capabilities in recent years, China was the world's sixth largest arms importer in 2014–18 and accounted for 4.2 percent of the global total. Its arms imports decreased by 7.0 percent between 2009–13 and 2014–18. Russia accounted for 70 percent of Chinese arms imports in 2014–18. China remains reliant on imports for certain arms technologies such as engines for combat aircraft and large ships as well as long-range air and missile defense systems. Its own arms industry has yet to develop the technological capability to match Russian suppliers in these fields.

Source: Excerpted from Stockholm International Peace Research Institute (SIPRI) : pieter d. wezeman, aude fleurant, alexandra kuimova, nan tian, and siemon t. wezeman, TRENDS IN INTERNATIONAL ARMS TRANSFERS, 2018, SIPRI Fact Sheet, April 2019

<https://www.sipri.org/publications/2019/sipri-fact-sheets/trends-international-arms-transfers-2018>, and SIPRI arms transfer data base.

# SIPRI Summary of China's Status as An Arms Exporter and Importer in 2019 - II

	Exporting Country	% Share of Global Arms			% Change Exports: 2014-2018	Main Clients Percentage Share of Exporter's Total		
		2014-18	2009-13	from 2009-13				
		to 2014-18 <sup>a</sup>	1 <sup>st</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>			
1	United States	36	30	29		Saudi Arabia (22)	Australia (7.7)	UAE (6.7)
2	Russia	21	27	-17		India (27)	China (14)	Algeria (14)
3	France	6.8	5.1	43		Egypt (28)	India (9.8)	Saudi Arabia (7.4)
4	Germany	6.4	6.1	13		South Korea (19)	Greece (10)	Israel (8.3)
5	China	5.2	5.5	2.7		Pakistan (37)	Bangladesh (16)	Algeria (11)
6	United Kingdom	4.2	4.3	5.9		Saudi Arabia (44)	Oman (15)	Indonesia (11)
7	Spain	3.2	2.9	20		Australia (42)	Turkey (13)	Saudi Arabia (8.3)
8	Israel	3.1	2.1	60		India (46)	Azerbaijan (17)	Vietnam (8.5)
9	Italy	2.3	2.7	-6.7		Turkey (15)	Algeria (9.1)	Israel (7.6)
10	Netherlands	2.1	1.9	16		Jordan (15)	Indonesia (15)	USA (11)
11	South Korea	1.8	1.0	94		Indonesia (17)	Iraq (17)	UK (15)
12	Ukraine	1.3	2.7	-47		China (27)	Russia (23)	Thailand (14)
13	Switzerland	1.0	0.9	20		Saudi Arabia (19)	China (18)	Indonesia (9.3)
14	Turkey	1.0	0.4	170		UAE (30)	Turkmenistan (23)	Saudi Arabia (10)
15	Sweden	0.7	1.9	-62		Saudi Arabia (16)	UAE (14)	Algeria (10)
16	Canada	0.6	0.9	-33		Saudi Arabia (22)	India (13)	UAE (7.6)
17	Norway	0.5	0.6	-12		Oman (28)	Finland (23)	USA (21)
18	UAE	0.3	0.2	103		Egypt (41)	Jordan (10)	Yemen (7.6)
19	Czechia	0.3	0.1	472		Iraq (40)	USA (17)	Vietnam (9.9)
20	Belarus	0.3	0.5	-26		Vietnam (37)	Sudan (18)	Myanmar (12)
21	Australia	0.3	0.3	3.9		USA (53)	Indonesia (25)	Oman (8.8)
22	South Africa	0.3	0.5	-35		USA (21)	UAE (21)	India (9.8)
23	Brazil	0.2	0.2	21		Afghanistan (32)	Indonesia (25)	Lebanon (9.1)
24	Finland	0.2	0.2	-9.1		Poland (56)	UK (7.1)	Sweden (6.7)
25	Portugal <sup>b</sup>	0.2	0.0	457		Romania (89)	Belgium (7.0)	Uruguay (2.7)

a. Change in volume of trade of total arms exports per exporter between periods

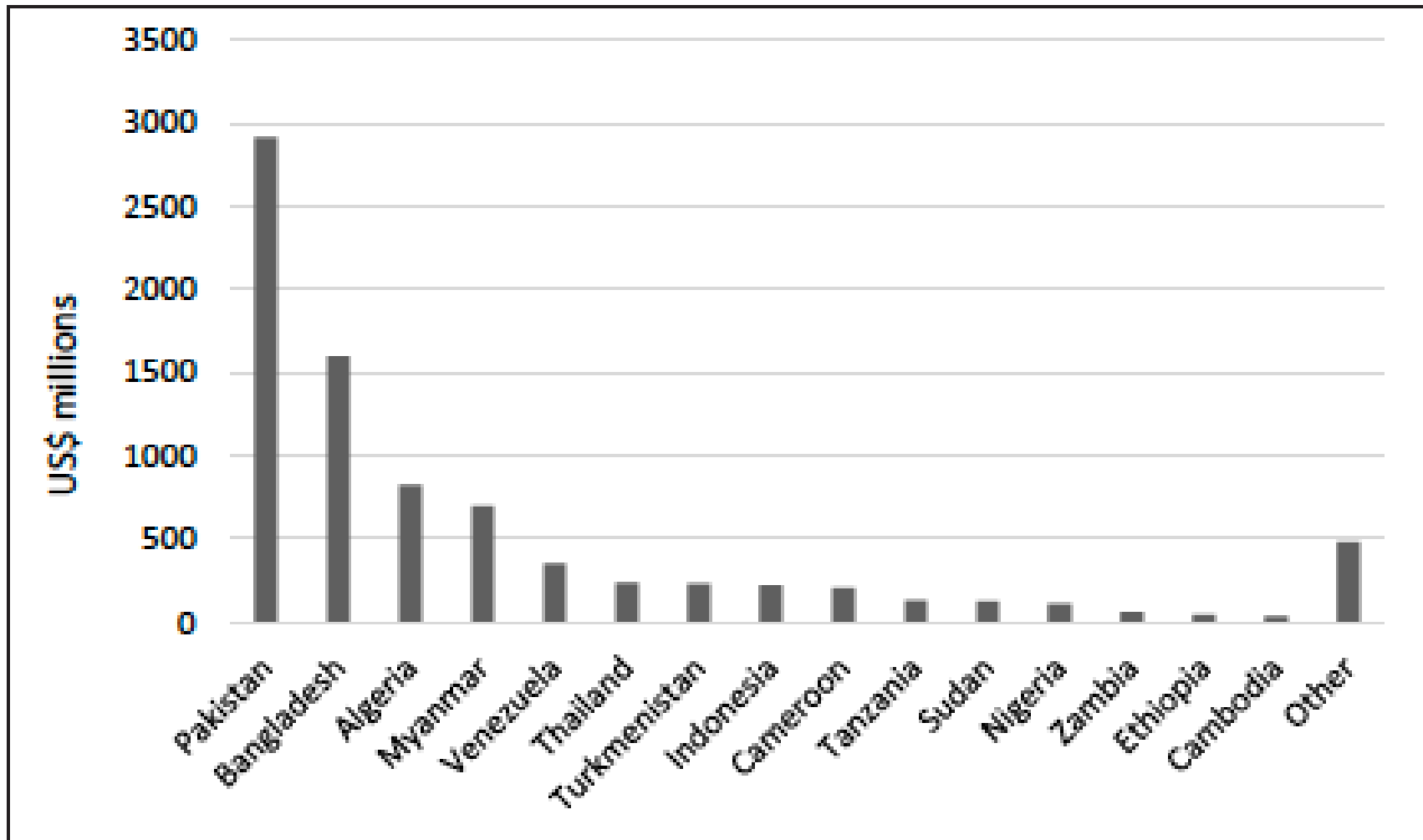
b. For Portugal, changes between periods is only 0.03%.

Source: Excerpted from Stockholm International Peace Research Institute (SIPRI): Pieter D. Wezeman, Aude Fleurant, Alexandra Kuimova, Nan Tian, and Siemon T. Wezeman, TRENDS IN INTERNATIONAL ARMS TRANSFERS, 2018, SIPRI Fact Sheet, April 2019

<https://www.sipri.org/publications/2019/sipri-fact-sheets/trends-international-arms-transfers-2018>, and SIPRI arms transfer data base.



## The “Proxy” Problem — China’s Arms Exports by Recipient: 2013-2017



*Source: Stockholm International Peace Research Institute, “SIPRI Arms Transfer Database.”*

# Shifting Impact on Outside Powers: Chinese Total Arms Exports by Major Weapons Category in 2010-2018

(SIPIRI Estimates of total numbers using SIPRI categories)

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Total
Aircraft	59	273	333	426	88	75	285	127	284	152	525	403	564	592	273	476	465	437	555	6388
Air defense systems	15	15	15	15	15			15				62	85	81	48	208	438	8	30	1050
Armored vehicles	16	64	25	45	131	64	100	128	167	177	428	263	387	637	271	241	221	289	184	3838
Artillery	70	16	20	45	38	10	24	25	36	40	35	48	17	26	94	46	16	23	32	660
Engines														0		1				1
Missiles	93	74	78	78	91	85	127	122	117	147	167	161	232	184	193	228	457	149	167	2951
Naval weapons	3	3	3		2	4		2						5	8	13	2	12		56
Sensors	16	16	13	21	13	38	51	35	41	115	69	26	69	108	39	25	90	55	10	847
Ships	27	55	40	70	35	11	81	56		508	255	290	161	415	235	608	671	254	63	3835
Total	299	515	525	700	413	286	668	509	644	1140	1478	1252	1515	2047	1160	1845	2360	1227	1040	19625

Stockholm International Peace Research Institute (SIPRI) [http://armstrade.sipri.org/armstrade/html/export\\_values.php](http://armstrade.sipri.org/armstrade/html/export_values.php), June 17, 2019; for full definition and details see SIPRI, <http://sipri.org/databases/armstransfers/sources-and-methods/>.

# Shifting Impact on Importing Powers: Value of Chinese Arms Exports by Importing Country in 2010-2018 - I

(In Comparative SIPRI Trend Indicator Values (TIVs) in Millions – Not Currency)

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Total
Afghanistan																		1		1
Algeria	11	12	15				61				18				68	247	499	17	33	980
Angola																1	15			15
Argentina											1									1
Bahamas																		0		0
Bahrain																	4			4
Bangladesh	11	2			7	1	184	66	10		13	81	151	480	204	451	261	204	75	2200
Belarus																	2	1	1	4
Benin											0			0						0
Bolivia				5								21			20		4		1	51
Burundi													5							5
Cambodia								56		4			15	39						114
Cameroon													9	118	85					212
Central African Republic																			1	1
Chad								4	2		16			39						61
Congo							1	0		1										2
Cote d'Ivoire																		4		4
Djibouti															8	1	4			13
DR Congo																1				1
Ecuador							0				8									8
Egypt		18	67	88	88	21		35	35	35	35		1	1	1			15	15	454

# Shifting Impact on Importing Powers: Value of Chinese Arms Exports by Importing Country in 2010-2018 - II

(In Comparative SIPRI Trend Indicator Values (TIVs) in Millions – Not Currency)

Equatorial Guinea										34										34
Ethiopia													2	50	2					53
Gabon					5		1													6
Ghana		2			1			14		11	2	56		22		13	8			130
Guyana			2																	2
Indonesia							10	3	3		2	8	65	74	35	41	42	37	30	350
Iran	69	80	81	84	80	43	54	47	47	47	62	52	31	9	9	9				807
Iraq					20											17				37
Jordan						8					2				1		24			35
Kazakhstan																	9		23	32
Kenya	12							10			13				7	10	11			61
Kuwait	30	15	20	21																86
Laos									7				15	15		1		3	51	91
Malaysia										5										5
Mali	7																	4		11
Mauritania			17	7													34			58
Mexico							6													6
Morocco											221	34	34							289
Mozambique															4		2			5
Myanmar	3	50	9	57	74	23	10	2	10	17	5	277	254	190	64	184	169	8	105	1508
Namibia		14					66		66	5			52	9			3	34		248
Nepal						2											8	1		10
Niger										1								3		4
Nigeria											156				57	22	36			271
Oman			3	15																18
Pakistan	69	299	286	267	77	78	98	144	250	758	747	578	583	719	413	620	751	559	448	7744

# Shifting Impact on Importing Powers: Value of Chinese Arms Exports by Importing Country in 2010-2018 - III

(In Comparative SIPIRI Trend Indicator Values (TIVs) in Millions – Not Currency)

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Total
Peru										1	1					13				15
Qatar																		29	88	118
Rwanda								7	3									1	3	14
Saudi Arabia									33	33						35	15	35	40	191
Senegal																	16	20		36
Seychelles												4			10					14
Sierra Leone							9					2				0	1			13
Slovakia																		13		13
Somalia																		2		2
South Sudan															12					12
Sri Lanka	29	21	3	8	18	28	49	48	59		4									266
Sudan		3	16	97	16	39	25	7	28	6	17	18	29	28	32	27	12	32	32	462
Syria										56	15				5					76
Tajikistan																			3	3
Tanzania				46			0	0		25		76	113	118	14	20		2		414
Thailand	25					11	11			12		2	20	24	8	1	77	131	50	372
Timor-Leste											18									18
Trinidad and Tobago																16				16
Turkey	6		7	7	14	14	28	35	35	35	35	35	35							286
Turkmenistan																	230	4		234
UAE														15	15	15	15	35	40	135
Uganda									14											14
Unknown recipient(s)					0															0
Uzbekistan															15					15
Venezuela							14	27	41	54	89	8	51	97	74	100	76			629
Zambia	28						21	4	2				51				33	33		170
Zimbabwe					13	21	21													55
Total	299	515	525	700	413	286	668	509	644	1140	1478	1252	1515	2047	1160	1845	2360	1227	1040	19625