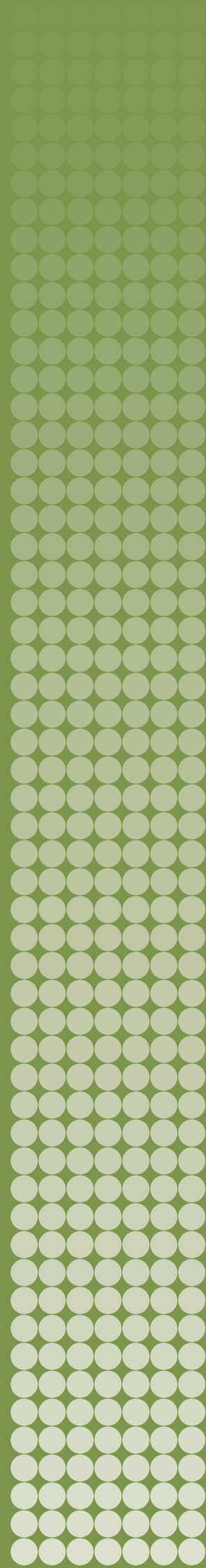


# A NEW ESTIMATE OF CHINA'S MILITARY EXPENDITURE

NAN TIAN AND FEI SU



**STOCKHOLM INTERNATIONAL  
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Nan Tian and Fei Su





## Executive summary

China publishes a national defence budget each year. In 2019 it reached 1.2 trillion yuan (US\$175 billion), making China the country with the second highest military spending in the world, behind only the United States. However, this figure does not account for all of China's military spending. Since the late 1990s many Western analysts have argued that major components of Chinese military activities are not reflected in the country's official defence budget.

While efforts have been made to produce more accurate estimates of China's military expenditure, the lack of public transparency surrounding the country's military allocations has been a major obstacle. To provide a more accurate representation of China's military spending, SIPRI's estimate—based on an analysis made in 1999—covers other items in addition to the official defence budget. These include appropriations for arms imports; commercial earnings from military-owned businesses; additional funding for military research, development, testing and evaluation; paramilitary expenses for the People's Armed Police; military demobilization, retirement and pension payments; additional military-related construction spending; and subsidies to loss-making arms companies.

However, given China's accelerating military modernization and reforms—on top of the changing security dynamics in the country—the existing estimate of China's military spending deserves a reassessment. This SIPRI report provides a comprehensive assessment of the financial resources China dedicates to military purposes. Using publicly available sources in both English and Chinese, the report presents a new estimate of Chinese military expenditure.

The new estimate—1660 billion yuan (\$240 billion) in 2019—is around 142 billion yuan (\$21 billion) less than the old SIPRI estimate. A key takeaway from the reassessment is the importance of continuous monitoring of a country's military spending. Changes in defence and economic policies can have a significant effect on military activities and how they are accounted for. Some expenses that were considered extra-budgetary in the 1990s or 2000s had probably become part of China's official budget by 2019. In the new estimate of China's military expenditure, new categories were added and others were removed or revised. For example, spending on military activities by the China Coast Guard is included in the new estimate, while appropriations for arms imports and commercial earnings from military-owned businesses are not. Revisions were made to three categories: spending on the paramilitary People's Armed Police; military demobilization, retirement and pension payments; and additional military construction expenses.

Although the new approach to estimating Chinese military expenditure improves on the old method, limited public transparency in budgeting on specific categories is still a cause of concern. SIPRI's estimate of China's military-related research and development, for instance, remains highly uncertain and there are question marks over some military construction spending and subsidies to the Chinese arms industry. Future research should focus on the wealth of publicly available Chinese-language sources, as there is still scope to improve the precision of the new estimate.



## Abbreviations

CCG	China Coast Guard
CMC	Central Military Commission
DOD	Department of Defense (of the United States)
IISS	International Institute for Strategic Studies
MCA	Ministry of Civil Affairs
MIIT	Ministry of Industry and Information Technology
MPS	Ministry of Public Security
NDRC	National Development and Reform Commission
PAP	People's Armed Police
PLA	People's Liberation Army
PLAN	People's Liberation Army Navy
R&D	Research and development
RDT&E	Research, development, testing and evaluation
SASTIND	State Administration for Science, Technology and Industry for National Defence
S&T	Science and technology



# 1. Introduction

China currently has the second largest military expenditure, after the United States. However, estimates of its total military spending vary substantially depending on the reporting source. According to the official budget, China's military spending in 2019 was about US\$175 billion, while external estimates range from \$200 billion in 2019 by the US Department of Defense (DOD), via \$225 billion in 2018 by the International Institute for Strategic Studies (IISS), up to \$261 billion in 2019 by SIPRI.<sup>1</sup>

Such variations can be explained by the fact that there is little public transparency regarding China's actual military spending.<sup>2</sup> Western institutes and analysts and even some experts in China have questioned the completeness of the official budget, arguing that official Chinese spending figures do not cover all Chinese military activities.<sup>3</sup> China budgets for the costs of some military-related activities that are generally regarded as military expenditure either fully or partially outside the official national defence budget. These activities include military research and development (R&D), paramilitary forces, military construction and arms imports.

In an attempt to include these missing categories, SIPRI estimates China's military spending—starting from 1989—based on an analysis by Shaoguang Wang that was published in *SIPRI Yearbook 1999*.<sup>4</sup> However, this assessment and the subsequent spending estimates are based on evidence from the 1980s and 1990s. With changing military and economic policies and security dynamics in China and the Asia-Pacific region more broadly in the past three decades, the existing estimate of China's military expenditure deserves a reassessment. An updated assessment and estimate of China's military expenditure will provide the public, policymakers and researchers with a better indication of the country's trajectory in regional and global geopolitics and a more accurate assessment of China's rise as a global military power.

This report provides an update of SIPRI's assessment of how best to estimate Chinese military expenditure. It builds on previous research exploring Chinese official budget documents as well as Western and Chinese scientific research in order to identify the key categories of military-related spending that fall outside official spending figures.<sup>5</sup> The report continues (in chapter 2) by describing the importance of military expenditure data, the need to estimate China's military spending figures and the need for updated estimates of those figures. The additional military-related spending categories of the old SIPRI estimate are then systematically explored and potential new categories assessed (in chapter 3). The new estimate of Chinese military spending is then presented (in chapter 4) and compared with the old SIPRI estimate and China's official national defence budget. The report ends (in chapter 5) by offering concluding thoughts and ideas for areas of future research.

<sup>1</sup> All figures are in current US dollars. US Department of Defense (DOD), *Military and Security Developments Involving the People's Republic of China 2020*, Annual Report to Congress (DOD: Washington, DC, 21 Aug. 2020), p. 140; International Institute for Strategic Studies (IISS), *The Military Balance 2020* (Routledge: Abingdon, 2020), p. 259; and SIPRI Military Expenditure Database, May 2020, <<http://sipri.org/databases/milex>>. The IISS estimate for 2019 was not accessible at the time of writing.

<sup>2</sup> Saunders, P. C. and Rustici, R., 'Chinese military transparency: Evaluating the 2010 Defense White Paper', Institute for National Strategic Studies (INSS) Strategic Forum, National Defense University, July 2011, p. 8.

<sup>3</sup> Bitzinger, R. A. and Lin, C., 'The defense budget of the People's Republic of China', Defense Budget Project, Nov. 1994, pp. 9–10; and Blasko, D. J. et al., *Defense-related Spending in China: A Preliminary Analysis and Comparison with American Equivalents* (United States–China Policy Foundation: Washington, DC, 2006).

<sup>4</sup> Wang, S., 'The military expenditure of China, 1989–98', *SIPRI Yearbook 1999: Armaments, Disarmament and International Security* (Oxford University Press: Oxford, 1999), pp. 334–49.

<sup>5</sup> Previous research includes Wang (note 4); Nouwens, M. and Béraud-Sudreau, L., *Assessing Chinese Defence Spending: Proposals for New Methodologies* (International Institute for Strategic Studies: London, Mar. 2020); and Perlo-Freeman, S., 'Measuring transparency in military expenditure: The case of China', Northeast Asia Defense Transparency Project Policy Brief no. 2011-4, University of California Institute on Global Conflict and Cooperation, Oct. 2011.

## 2. The need to measure military expenditure: The case of China

Military expenditure figures are indicators of the economic resources spent by a state for military purposes. Such data is of interest to a variety of stakeholders, such as governments, experts and the interested public.<sup>6</sup> The uses of military expenditure data by interested parties can range from assessing the burden of a country's military forces on its economy; via determining how a government prioritizes the military relative to other sectors such as health and education; to understanding the factors that determine military spending and the impact of this spending on security and armed conflict.<sup>7</sup>

Such data is not readily available. SIPRI thus gathers and collates expenditure data for most countries in order to contribute to transparency on military spending around the world. While the SIPRI data is mainly based on open and primary sources, some of the official data has limitations in scope and standardization. The information reported by countries does not always comprehensively cover all expenditure items that can be regarded as having a military purpose, and so national defence budgets are not always comparable between countries. SIPRI has thus adopted a definition that, as best as possible, covers all types of expenditure for military purposes and which, as far as possible, it applies for all countries (see box 2.1).

In addition to direct spending on the armed forces and defence ministry, the SIPRI definition includes indirect spending that supports the functioning of the military organization (e.g. pensions of former troops). It also frequently includes spending that is not in the country's main national defence budget. Where there is limited public transparency in public expenditure, estimates have to be made, based on available data and information. This is the case for China.

The military expenditure figures published by the Chinese Government in its financial documents are typically only the total headline figure for 'national defence' expenditure, with no disaggregated information. Limited disaggregation in tables in some of its defence white papers and reports to the United Nations do little to compensate for this lack of detail.<sup>8</sup> China's limited transparency in military affairs has led many to question the accuracy and credibility of its official national defence budget.<sup>9</sup> Research institutes such as SIPRI and the IISS and government departments such as the US DOD thus try to estimate the actual costs of China's military activities.

SIPRI's estimates of China's military expenditure are based on Wang's analysis made in the late 1990s.<sup>10</sup> This assessed the extent to which Chinese national defence budget data corresponded to the SIPRI definition. In other words, Wang assessed what items are part of the national defence budget and what additional expenditure items should be added in order to generate an estimate in line with the SIPRI definition that is applied to all countries.<sup>11</sup> SIPRI has maintained this approach to assessing

<sup>6</sup> Perlo-Freeman, S., 'Monitoring military expenditure', SIPRI Backgrounder, 11 Jan. 2017.

<sup>7</sup> Dunne, J. P. and Tian, N., 'Military expenditure and economic growth: A survey', *Economics of Peace and Security Journal*, vol. 8, no. 1 (2013), pp. 5–11.

<sup>8</sup> Chinese State Council, 2010年中国的国防 [China's national defence in 2010], Defence White Paper (Chinese State Council Information Office: Beijing, Mar. 2011), chapter 8; and Chinese State Council, 新时代的中国国防 [China's national defence in the new era], Defence White Paper (Chinese State Council Information Office: Beijing, July 2019); and Chinese Government, Report on military expenditure to the United Nations, 2017.

<sup>9</sup> Liff, A. P. and Erickson, A. S., 'Demystifying China's defence spending: Less mysterious in the aggregate', *China Quarterly*, vol. 216 (Dec. 2013), pp. 805–30.

<sup>10</sup> Wang (note 4).

<sup>11</sup> Wang (note 4); and Bitzinger, R. A., 'Analyzing Chinese military expenditures', eds S. J. Flanagan and M. E. Marti, *The People's Liberation Army and China in Transition* (National Defense University Press: Washington, DC, 2003), pp. 177–93.

**Box 2.1.** SIPRI's definition, sources and methods for military expenditure

The main purpose of SIPRI's data on military expenditure is to provide an identifiable measure of the scale of financial resources absorbed by the military.

Although the lack of sufficiently detailed data makes it difficult to apply a common definition of military expenditure consistently to all countries, SIPRI has adopted a definition as a guideline. Where possible, SIPRI military expenditure data includes all current and capital expenditure on (a) the armed forces, including peacekeeping forces; (b) defence ministries and other government agencies engaged in defence projects; (c) paramilitary forces, when judged to be trained and equipped for military operations; and (d) military space activities. This data should include expenditure on personnel (including salaries of military and civil personnel, pensions of military personnel and social services for personnel), operations and maintenance, procurement, military research and development, and military aid (in the military expenditure of the donor country). Civil defence and current expenditures on previous military activities, such as veterans' benefits, demobilization, conversion, weapon destruction and military involvement in non-military activities (e.g. policing) are excluded when disaggregated data is available.

In practice, it is not possible to apply this definition for all countries, and in many cases SIPRI is confined to using the national data provided. Priority is therefore given to the choice of a uniform definition over time for each country in order to achieve consistency over time, rather than to adjusting the figures for single years according to a common definition. In the light of these difficulties, military expenditure data is most appropriately used for comparisons over time and may be less suitable for close comparison between individual countries.

SIPRI data reflects the official data reported by national governments. Such data is found in official publications such as budget documents, public finance statistics, national audit agencies' reports and government responses to questionnaires sent out by SIPRI or in reports published by the United Nations, the International Monetary Fund and the North Atlantic Treaty Organization to which states have submitted data about their own national military spending. In a few cases, the original government document sources are not available (e.g. because they are not published online); however, some of the content of these documents may be available in newspaper reports.

As a general rule, SIPRI takes national data to be accurate until there is convincing information to the contrary. Estimates are made primarily when the coverage of official data does not correspond to the SIPRI definition or when there are no consistent time series available that cover the entire period covered by the data.

Source: SIPRI Military Expenditure Database, 'Sources and methods', [n.d.].

Chinese military expenditure, with slight updates and revisions over time to account for changing realities, budget practices and information availability in China. However, there are now reasons to conduct a more comprehensive review of the estimates for China.<sup>12</sup>

The main reason for a review is that China's economic, defence and security policies have continued to change at a dramatic pace.<sup>13</sup> In parallel with its increasing global influence, China is developing the capabilities of its armed forces, the People's Liberation Army (PLA), to meet demands to protect its foreign and domestic national interests.<sup>14</sup> These changes have had implications for the extent of China's military activities and the way in which China's armed forces are funded, and have led to a substantial increase in the level of spending.<sup>15</sup>

<sup>12</sup> Perlo-Freeman, S., 'China's military expenditure', *SIPRI Yearbook 2016: Armaments, Disarmament and International Security* (Oxford University Press: Oxford, 2016), pp. 516–19.

<sup>13</sup> Chase, M. S., 'Xi in command: Downsizing and reorganizing the People's Liberation Army (PLA)', Asia Maritime Transparency Initiative, Center for Strategic and International Studies (CSIS), 11 Sep. 2015.

<sup>14</sup> Chinese State Council, 新时代的中国国防 [China's national defence in the new era] (note 8); Chinese State Council, 2004年中国的国防 [China's national defence in 2004], Defence White Paper (Chinese State Council Information Office: Beijing, Dec. 2004), chapter 2; and Chinese State Council, 中国的军事战略 [China's military strategy] (Chinese State Council Information Office: Beijing, May 2015), chapter 3.

<sup>15</sup> Liff and Erickson (note 9), pp. 805–30; Crane, K. et al., *Modernizing China's Military: Opportunities and Constraints* (RAND Corporation: Santa Monica, CA, 2005); Lewis, J. (约翰·刘易斯) and Xue, L. (薛理泰), '中国军事战略方针及核战略之演变' [Evolution of China's military strategic approach and nuclear strategy], *领导者* [Leader], vol. 38 (Feb. 2011); and Ye, H. (叶晖南), '建国以来我国国防战略的四次重大调整' [Four major adjustments to China's national defence strategy since the founding of the People's Republic of China], Communist Party of China History Network, 3 June 2016.

### 3. The components of SIPRI's estimate of Chinese military expenditure

SIPRI's estimate since 1999 has combined the official defence budget with estimates for seven additional expenditure items identified by Wang: (a) arms imports; (b) commercial earnings from military-owned businesses; (c) arms industry subsidies; (d) additional military research, development, testing and evaluation (RDT&E); (e) paramilitary expenses for the People's Armed Police (PAP); (f) payments to demobilized and retired soldiers; and (g) additional military-related construction spending.<sup>16</sup>

The sources of data for the additional categories have been the China Public Finance Yearbook, the China Statistical Yearbook and other official publications. In some cases, if a data series identified by Wang in 1999 is no longer available, additional estimates for more recent years have been necessary.

The following three subsections review items for inclusion in SIPRI's estimate. The first identifies two of Wang's items that are no longer relevant. The second updates four of his items and identifies a new item that needs to be added to the estimate. The third subsection identifies an item that can no longer be included in China's total military expenditure because of a lack of data and two further items that should be included but cannot be.

#### Categories to be phased out or excluded from SIPRI's estimate of China's military expenditure

##### *Appropriations for arms imports outside the national defence budget*

Since Russia supplies over three-quarters of China's arms imports, SIPRI uses figures provided by Russia for the value of its arms transfers to China as the basis for its estimates of China's arms imports for the years where this information is available.<sup>17</sup> For the years for which these figures are not available, estimates are based on the rate of change in China's arms imports from Russia as measured by the SIPRI Arms Transfers Database.<sup>18</sup>

There is limited and contradictory information on whether the cost of arms imports is included in China's official national defence budget. Chinese sources state that the cost of arms procurement from abroad is part of the procurement budget under the equipment line item in the defence budget.<sup>19</sup> However, some Western sources suspect that foreign procurement is funded through a special account outside the official defence budget.<sup>20</sup> SIPRI has followed the recommendation made by Wang to add an estimate of China's spending on arms imports to China's total military expenditure.

However, as argued in an IISS paper by Meia Nouwens and Lucie Béraud-Sudreau, none of the sources used by Wang provide convincing arguments or evidence that arms imports are indeed funded outside the official defence budget.<sup>21</sup> Further assessments on this issue remain unconvincing and inconclusive.<sup>22</sup> Almost all Western publications on this topic refer back to Wang's original publication or simply take it as given that

<sup>16</sup> Wang (note 4).

<sup>17</sup> Makiyenko, K., 'The Russian–Chinese arms trade: An attempt at qualitative analysis', *Moscow Defense Brief*, no. 2 (2004); and Interfax, 'Russia's arms exports to China total \$16 bln since 2001—Rosoboronexport chief', *World News Connection*, 10 Apr. 2009.

<sup>18</sup> SIPRI Arms Transfers Database, Mar. 2020, <<http://sipri.org/databases/armstransfers>>.

<sup>19</sup> Nouwens and Béraud-Sudreau (note 5).

<sup>20</sup> Bitzinger and Lin (note 3), pp. 9–10; and Wang (note 4).

<sup>21</sup> Nouwens and Béraud-Sudreau (note 5).

<sup>22</sup> Blasko et al. (note 3).



**Table 3.1.** China's official national defence budget, by category, 2010–17

Year	Personnel		Training and maintenance		Equipment		Total (b. yuan)
	b. yuan	Share (%)	b. yuan	Share (%)	b. yuan	Share (%)	
2010	185.9	35	170.1	32	177.4	33	533.3
2011	206.5	34	189.9	32	206.3	34	602.8
2012	195.6	29	233.0	35	240.6	36	669.2
2013	200.2	27	270.0	36	270.9	37	741.1
2014	237.2	29	268.0	32	323.7	39	829.0
2015	281.9	31	261.5	29	365.4	40	908.8
2016	306.0	31	267.0	27	403.6	41	976.6
2017	321.1	31	293.4	28	428.8	41	1 043.2

Source: Chinese State Council, 新时代的中国国防 [China's national defence in the new era], Defence White Paper (Chinese State Council Information Office: Beijing, July 2019).

financial resources dedicated to foreign arms acquisition must fall outside the normal budget.<sup>23</sup> This suggests a danger of circular referencing and highlights the need to review this line item in SIPRI's estimate.

An additional consideration in the 1990s was that the reported size of China's official defence budget did not match the known military activities. The cost of arms imports was identified at that time as a possible missing component. In the early 1990s China imported a considerable number of weapons from Russia, ranging from combat aircraft to submarines. It was estimated that in 1991–92 alone, China signed contracts worth about \$2 billion with Russia.<sup>24</sup> In 1991–92 Chinese military spending averaged around \$11 billion per year. A budgetary breakdown given in China's 1995 Defence White Paper—that total military spending was split roughly evenly between personnel, operations and maintenance, and equipment—meant annual spending on equipment should have been approximately \$3.6 billion at that time.<sup>25</sup> As well as procurement from abroad, this included R&D, testing, domestic procurement, repair, maintenance, transport and storage. This relatively low figure did not match the numerous large and expensive procurement agreements made by China.

It was thus realistic for Wang to suggest that some spending categories, including major foreign weapon purchases, were being funded outside the official defence budget.

By 2019 the discrepancy was less obvious. Official Chinese defence spending was \$175 billion—spending around one-third of this on equipment would give almost \$60 billion. Official reports show that spending on equipment (which according to official sources includes all procurement) increased steadily from 33 per cent of total reported spending in 2010 to 41 per cent in 2017 (see table 3.1). Moreover, China is now almost completely self-sufficient in arms production, and imports are likely to account for a smaller share of total procurement spending.<sup>26</sup>

Thus, without concrete evidence to support the suspicion of extra-budgetary spending on foreign procurement, Chinese arms imports can now be assumed to be part of the official national defence budget.

A revision of the SIPRI estimate must maintain a consistent time series for Chinese military spending while remaining in line with the assessment of the likelihood of extra-budgetary spending on arms imports in the 1990s and possibly the early 2000s.

<sup>23</sup> Blasko et al. (note 3); and Liff and Erickson (note 9).

<sup>24</sup> Bitzinger and Lin (note 3), pp. 6–8.

<sup>25</sup> Chinese State Council, 中国的军备控制与裁军 [China: Arms control and disarmament], Defence White Paper (Chinese State Council Information Office: Beijing, Nov. 1995), chapter 3.

<sup>26</sup> Wezeman, S. T., 'China, Russia and the shifting landscape of arms sales', SIPRI Background, 5 July 2017; and Tian, N. and Su, F., 'Estimating the arms sales of Chinese companies', SIPRI Insights on Peace and Security no. 2020/2, Jan. 2020, pp. 14–15.

In the new estimate, the arms imports category thus remains as an additional item outside the official defence budget up to 2010 (when arms imports are estimated to have totalled 4.1 billion yuan). Thereafter, expenditure on arms imports is gradually phased out as an additional item, with a decrease of 0.5 billion yuan (in constant prices) per year. By 2020 all arms imports are estimated to be paid for by the equipment expenditure reported in the official defence budget.

#### *Commercial earnings from military-owned businesses*

The PLA has a long tradition dating back to the 1980s of participating in profitable commercial activities.<sup>27</sup> Such economic activities are called 'paid services'.<sup>28</sup> According to Wang, the majority of the revenue from these activities was used to make up for shortfalls in the PLA budget for soldiers' living expenses.<sup>29</sup> A reform in 1998 attempted to curtail the involvement of PLA soldiers and officers in privately owned enterprises, such as renting out military barracks, admitting civilians to PLA-run hospitals or agricultural production.<sup>30</sup>

In 2015 President Xi ordered all these types of activity to cease within three years.<sup>31</sup> According to state media, 40 per cent of PLA commercial activities had stopped by 2017.<sup>32</sup> In 2019 China's state-run news agency Xinhua acknowledged that the 'task is a heavy responsibility'.<sup>33</sup> This implies that some residual PLA 'paid services' are probably still active. However, these residual commercial activities are likely to be much smaller in scale than in the 1980s and 1990s.

Due to the lack of information on the size or scope of these remaining activities, it is impossible to estimate their value. In 2018 SIPRI decided to stop adding the extra-budgetary earning by the PLA to the total estimate of Chinese military spending. This decision will also apply to the new estimate: commercial earnings from military-owned businesses are not counted as part of China's total military expenditure.

### **Categories included in SIPRI's estimate of China's military expenditure**

#### *Additional funding for military research, development, testing and evaluation outside the national defence budget*

China's R&D expenditure, both civil and military, has often been referred to as a 'black box'.<sup>34</sup> China's 2010 Defence White Paper asserted that military RDT&E spending is included in the official defence budget, under the equipment category.<sup>35</sup> Despite this, there is evidence that additional spending on R&D outside the defence budget continues.<sup>36</sup> Without official government information on either the total amount allocated or the amount actually spent on these activities, estimates are required.

SIPRI's old estimate for additional spending on military RDT&E follows three distinct data series. Figures for the period 1989–96 are based on specific assumptions on the shares devoted to military R&D in two R&D funds outside the national defence budget: the fund for general R&D and the fund for new product testing. Wang assumed

<sup>27</sup> Wang (note 4).

<sup>28</sup> Mulvenon, J., 'PLA Divesture 2.0: We mean it this time', *China Leadership Monitor*, no. 50 (summer 2016).

<sup>29</sup> Wang (note 4).

<sup>30</sup> Mulvenon (note 28); and Wang (note 4).

<sup>31</sup> Chan, M., 'Bringing an end to PLA Inc.', *South China Morning Post*, 14 Apr. 2016.

<sup>32</sup> Zhao, L., 'PLA slashes commercial activities', *China Daily*, 19 Jan. 2017.

<sup>33</sup> Xinhua, '军地合力推进全面停止军队有偿服务工作纪实' [Military and local forces work together to promote the complete suspension of paid services in the military], 10 July 2019 (author translation).

<sup>34</sup> E.g. Sun, Y. and Cao, C., 'Demystifying central government R&D spending in China', *Science*, 29 Aug. 2014, pp. 1006–1008; and Nouwens and Béraud-Sudreau (note 5).

<sup>35</sup> Chinese State Council, 2010年中国的国防 [China's national defence in 2010] (note 8).

<sup>36</sup> Sun and Cao (note 34).

that the military share of general R&D was 10 per cent for 1989–91 and 15 per cent for 1992–96 and that the share of new product testing was 30 per cent for 1989–91 and 35 per cent for 1992–96.<sup>37</sup> The data series for these two R&D funds ended in 1996. For 1997–2006 estimates of additional military RDT&E are based on an existing central government appropriation for science and technology (S&T). This used a different classification system, which gave slightly higher figures than the previous series.

SIPRI updated its estimate for additional military RDT&E in 2015 based on the work of Yutao Sun and Cong Cao.<sup>38</sup> The updated estimate was based on a share of a new and more accurate total figure for central government appropriations for S&T. This estimate for additional military RDT&E was revised for the period dating back to 2007, the earliest year for this data series, and was applied up to 2019. The estimate is based on information for 2011–14 on the proportion of the S&T budget that is allocated to civilian agencies that disclose their spending in annual reports. The remainder is assumed to be allocated to the agencies with military or security significance that do not publicly report spending. It is estimated that 90 per cent of this spending is for military purposes. Using this fixed share for the year 2011, the growth rate of central government spending on S&T is used to estimate the annual changes in additional military RDT&E spending.

An alternative method for estimating additional military RDT&E was considered. In contrast to the existing estimate, which is based on the annual growth rate of the central government's S&T spending, the alternative estimate would use the annual discrepancy between S&T spending as reported by the various central government agencies and the S&T spending as reported by the central government. However, to preserve data consistency over time and because of a lack of information on the types of agency that disclose their S&T spending, the existing, post-2015 method will be maintained to estimate additional military RTD&E spending.

#### *Spending on the paramilitary People's Armed Police*

SIPRI's definition of military expenditure includes spending on paramilitary forces that are judged to be trained and equipped for military operations (see box 2.1). The PAP was established in 1982 as a paramilitary force with primary responsibility for maintaining domestic stability during peacetime and providing support for the PLA during wartime.<sup>39</sup> This fits the role of a paramilitary that is trained and equipped for military operations and its budget is thus counted in SIPRI's estimate of Chinese military expenditure.<sup>40</sup>

The PAP was the largest additional spending component added to the official defence budget. Expenses for the PAP are paid from the public safety budget under the Ministry of Public Security (MPS), outside the national defence budget. The PAP is financed by both central and local governments (both under the MPS budget)—taken together, these make up SIPRI's estimate of Chinese paramilitary spending. Actual expenditure on the PAP can be found for the years 1989–2018, while the figure for 2019 is estimated based on the rate of change of the official defence budget.

However, the PAP has also fulfilled various non-military tasks within China such as responding to fires and natural disasters and guarding mines, forestry and borders. A reform in 2017 redefined both the role and command structure of the PAP. It shifted the command and control of the PAP to fall under the Central Military Commission

<sup>37</sup> Wang (note 4).

<sup>38</sup> Sun and Cao (note 34).

<sup>39</sup> Wuthnow, J., *China's Other Army, The People's Armed Police in an Era of Reform*, China Strategic Perspectives no. 14 (National Defense University, Institute for National Strategic Studies: Washington, DC, Apr. 2019).

<sup>40</sup> Boyd, H. and Nouwens, M., 'China's People's Armed Police: Reorganised and refocused', IISS Military Balance Blog, 21 June 2019.

(CMC), eliminating the previously dual leadership under the CMC and the State Council that had prevailed since 1982.<sup>41</sup> As a result, many of the law enforcement and economic activity forces have been decommissioned. The gold mining, forestry, firefighting and hydroelectricity forces are no longer part of the PAP; they fall instead under the corresponding state authorities.<sup>42</sup> Border guards and other public security guard forces have also been removed from the PAP and merged with the MPS. In a further reform, in July 2018 the China Coast Guard (CCG) was transferred from the State Council to the PAP, although it is not included in the PAP budget (see below).

The 2017 PAP reforms make a clearer distinction between military and non-military activities, which facilitates estimates of military spending. Actual spending on the PAP in 2019, as reported in the final national government accounts, was 40 per cent lower than in 2018, and so is assumed to no longer include economic activities.<sup>43</sup> The official PAP budget now represents a more precise estimate of spending on what SIPRI considers paramilitary forces trained and equipped for military operations.

However, the new, more precise figures show that the historical estimates of (central and local) spending on the PAP for the period 1989–2018 were too high. Revised figures must be estimated that exclude the share of spending on the gold mine, forestry and border guards, firefighting and other non-military activities.

The split between central and local funding in China's domestic security budget indicates that most of the paramilitary forces with a dual military role are funded from the central government.<sup>44</sup> Before the 2017 reform, the non-militarized forces, such as the mining, forestry, firefighting and border guards, were mostly funded through the local government PAP budgets. Disaggregating the PAP budget into central and local spending shows that in 2019 local spending on the PAP (7.6 billion yuan) was 85 per cent lower than in 2018, while central PAP spending (116 billion yuan) was 24 per cent lower.<sup>45</sup>

According to the IISS, 'internal security' or military-related personnel represent approximately two-thirds of total PAP personnel.<sup>46</sup> This proportion corresponds roughly with the remaining spending on the PAP (central and local) after the 40 per cent fall between 2018 and 2019.<sup>47</sup>

Based on the fall in spending between 2018 and 2019, about 85 per cent of the local PAP budget and 25 per cent of the central PAP budget should be subtracted from the historical figures as a way of deducting the costs of the paramilitary forces engaged in non-military activities. The new estimate of PAP spending for 1989–2018 is thus made up of 75 per cent of the central government PAP expenditure and 15 per cent of the local government expenditure. For 2019 onwards, the entire budget of the PAP, central and local, is counted as part of China's military expenditure.

#### *Spending on the China Coast Guard*

SIPRI's old estimate of Chinese military spending does not include spending on the CCG. This approach needs to be reassessed following the 2018 reforms and restructuring of the CCG and in the context of China's territorial claims in the East and South China seas.

<sup>41</sup> Wuthnow (note 39).

<sup>42</sup> Chinese State Council, 新时代的中国国防 [China's national defence in the new era] (note 8).

<sup>43</sup> Chinese Ministry of Finance, Budget Department, Central level general public budget expenditure for 2018, 18 July 2019; and 2019, 6 July 2020; and Chinese Ministry of Finance, Budget Department, Local governments' general public budget expenditure for 2018, 18 July 2019; and 2019, 31 July 2020 (all in Chinese).

<sup>44</sup> Wuthnow (note 39), p. 28; and Zenz, A., 'Corralling the People's Armed Police: Centralizing control to reflect centralized budgets', *China Brief*, 24 Apr. 2018.

<sup>45</sup> Chinese Ministry of Finance (note 43).

<sup>46</sup> International Institute for Strategic Studies, *The Military Balance*, 2016–20 edns (Routledge: Abingdon, 2016–20).

<sup>47</sup> Chinese Ministry of Finance (note 43).

The CCG was established in 2013 by merging five maritime law enforcement agencies. It was made responsible for a wide range of activities under the umbrella of maritime rights protection such as 'enforcement of China's sovereignty claims, surveillance, protection of fisheries' resources, anti-smuggling, and general law enforcement'.<sup>48</sup> This new force was primarily involved with civil activities and was under the direct control of the State Oceanic Administration, a civil authority. It thus made sense to exclude spending on the CCG from China's military expenditure.

The 2018 reform transferred control of the CCG to the PAP, which itself had been brought under the direct control of the CMC in 2017.<sup>49</sup> This has blurred the lines between the civil duties of the CCG and new military activities that could be required under the CMC.

Three elements indicate that the CCG now has a paramilitary status: equipment, training, and ranks and leadership.

First, the CCG has been acquiring, even prior to the 2018 reform, vessels with increasing firepower and tonnage. The CCG's largest ships (e.g. the *Haijing 3901* patrol cutter) now possess 76-millimetre cannons and anti-aircraft guns.<sup>50</sup> By way of comparison, the US Coast Guard's Legend-class cutters, its largest national security cutters, are armed with 57-mm guns. Other classes of ship recently incorporated into the CCG include the Type 818, which is based on the Type 054A frigate of the PLA Navy (PLAN), and converted ships such as the Type 053H2G, which previously belonged to the PLAN.<sup>51</sup>

Second, part of the CCG has increasingly received the same training as the PAP. The CCG has also held numerous exercises with the PLAN.<sup>52</sup>

Third, CCG personnel are now ranked according to the PAP structure and the PLAN has transferred some of its officers to the CCG. This includes Rear Admiral Wang Zhongcai, who became the CCG's commander in December 2018. Wang previously took part in the PLAN's operation in the Gulf of Aden and was deputy chief of staff of the East Sea Fleet, which was responsible for the East China Sea and the waters near Taiwan.<sup>53</sup> Placing an ex-naval admiral at the helm of the CCG indicates that the military has taken firmer control of maritime forces that were previously predominantly civilian.

Parts of the CCG thus do fall under the definition of a paramilitary force. This conclusion can be extended back to 2013, when the CCG was created in its current form. Although the change in command from the State Council to the PAP occurred in 2018, the changes to equipment and training started in 2013.

Based on estimates by Lyle Morris and Nouwens and Béraud-Sudreau, China allocated an estimated average of 11.2 billion yuan (\$1.7 billion) per year to the CCG in 2011–15.<sup>54</sup> However, not all of the spending on the CCG should be counted as military spending. Many CCG ships are lightly armed or unarmed and conduct non-military-related activities. For example, the \$1.7 billion average annual spending estimated by

<sup>48</sup> US Department of Defense (DOD), *Military and Security Developments Involving the People's Republic of China 2019*, Annual Report to Congress (DOD: Washington, DC, 2 May 2019), p. 53. See also Wang, Y. and Chang, N., 'The restructuring of the State Oceanic Administration in China: Moving toward a more integrated governance approach', *International Journal of Marine and Coastal Law*, vol. 30, no. 4 (Nov. 2015), pp. 795–807.

<sup>49</sup> Morris, L., 'China welcomes its newest armed force: The coast guard', *War on the Rocks*, 4 Apr. 2018; and Zhen, L., 'China's military police given control of coastguard as Beijing boosts maritime security', *South China Morning Post*, 21 Mar. 2018.

<sup>50</sup> Ng, J., 'Coast guard with muscle', *Asian Military Review*, Sep. 2019.

<sup>51</sup> Bhat, V., 'China builds new coast guard ships', *Observer Research Foundation*, 20 Apr. 2017; and Navy Recognition, 'PLAN Type 053H2G frigates transferred to China Coast Guard & converted into patrol vessels', 19 Aug. 2015.

<sup>52</sup> Morris, L. J., 'Blunt defenders of sovereignty—The rise of coast guards in East and Southeast Asia', *Naval War College Review*, vol. 70, no. 2 (spring 2017), pp. 75–112.

<sup>53</sup> Ng, T. and Zhou, L., 'China Coast Guard heads to front line to enforce Beijing's South China Sea claims', *South China Morning Post*, 9 Feb. 2019.

<sup>54</sup> Morris (note 52) pp. 75–112; and Nouwens and Béraud-Sudreau (note 5).



**Table 3.2.** Ships operated by the China Coast Guard, 2015–19

Ship type	2015	2016	2017	2018	2019
<i>Patrol and coastal combatants</i>	326	462	448	422	523
PSOH	18	31	38	41	42
PSO	33	35	47	45	45
PCO	53	54	33	33	33
PCC	–	120	130	103	103
PB/PBF	222	222	200	200	300
<i>Logistics support</i>	7	16	21	28	27
<b>Total number of ships</b>	<b>333</b>	<b>478</b>	<b>469</b>	<b>450</b>	<b>550</b>

– = zero; PB = patrol boat; PBF = patrol boat fast; PCC = patrol craft coastal; PCO = patrol craft offshore; PSO = offshore-patrol ship; PSOH = offshore-patrol ship with hanger pontoon bridging.

Sources: International Institute for Strategic Studies, *The Military Balance*, 2016–20 edns (Routledge: Abingdon, 2016–20).

Morris includes the costs of maritime anti-smuggling police, which do not fall under the definition of military spending.<sup>55</sup> Based on a combination of the CCG's activities, types of ship and weaponry it is thus estimated that the military role of the CCG represents approximately 50 per cent of its budget.

A further estimate must be made for the years after 2015. Due to the lack of budgetary information of the CCG, one way to assess changes in spending on the CCG is through the increase in the number of its ships.<sup>56</sup> An estimate of spending by the CCG can then be based on the number of ships, as published each year in the *Military Balance*.

The average annual increase in the number of ships operated by the CCG between 2015 and 2019 was 16 per cent (see table 3.2). Based on the estimate that 50 per cent of CCG spending in 2015—that is 5.6 billion yuan (\$0.9 billion)—counts as military spending, an increase of 16 per cent per annum would mean spending of 6.9 billion yuan (\$1.0 billion) in 2016, 8.1 billion yuan (\$1.2 billion) in 2017, 9.2 billion yuan (\$1.4 billion) in 2018 and 11.1 billion yuan (\$1.6 billion) in 2019.

#### *Military demobilization, retirement and pension payments*

The SIPRI Military Expenditure Database specifies whether each estimate of Chinese military spending includes military pensions. Based on the 2019 Defence White Paper, pensions seem to be included in the personnel sector of the official defence budget. Expenditure on personnel includes subsidies and pensions for officers, non-ranking officers, soldiers and contracted civilians as well as retirees supported from the defence budget.<sup>57</sup>

However, part of the pensions and demobilization allowances for PLA personnel are funded through the Ministry of Civil Affairs (MCA), China's interior ministry. Wang assumed that the line item 'compensation expenditure' in the MCA's budget was a military-related aspect of demobilization and retirement spending.<sup>58</sup> SIPRI's estimate of military demobilization and retirement payments outside the official defence budget is based on two different data series. For the period 1989–2012 the estimate is based on the line item 'compensation expenditure' in the MCA budget, as suggested by Wang. This MCA series is not published beyond 2012. For 2013–19 the estimate is based on two components: the retirement settlement and the demobilized army cadre emplacement in the pensions subsection of the social security and employment expenditure line item in the official state budget. The 2013–19 data series matches the

<sup>55</sup> Morris (note 52), pp. 75–112.

<sup>56</sup> This is the approach of Erickson, A. S., Hickey, J. and Holst, H., 'Surging second sea force: China's maritime law-enforcement forces, capabilities, and future in the gray zone and beyond', *Naval War College Review*, vol. 72, no. 2 (spring 2019), pp. 11–35.

<sup>57</sup> Chinese State Council, 新时代的中国国防 [China's national defence in the new era] (note 8).

<sup>58</sup> Wang (note 4).

**Table 3.3.** Spending on demobilization and retirement payments outside China's national defence budget, 2015–19

Figures are billion yuan.

	2015	2016	2017	2018	2019
Retirement settlement	59.6	59.0	73.7	74.9	84.2
Demobilized army cadre emplacement	16.7	21.0	25.5	29.3	35.5
Living allowance for demobilization of veterans in townships	15.0	16.6	16.6	16.8	16.7
Living allowance for soldiers who retire due to old age to rural areas	1.3	1.9	2.5	2.8	3.3
<b>Total</b>	<b>92.7</b>	<b>98.4</b>	<b>118.4</b>	<b>123.8</b>	<b>139.8</b>

Sources: Chinese Ministry of Finance, Budget Department, National general public budget expenditure for 2015, 20 July 2016; 2016, 13 July 2017; 2017, 12 July 2018; 2018, 18 July 2019; and 2019, 31 July 2019 (all in Chinese).

'compensation expenditure' series published by the MCA closely; it was thus judged to be a reasonable replacement for the 1989–2012 series.

In addition to these two components, there is also a range of compensation expenses in the budget of the Ministry of Veterans Affairs (MVA) such as death compensation, disability compensation, the living allowance for demobilization of veterans in townships, and the living allowance for soldiers who retired due to old age to rural areas (see table 3.3). These are similar to items that are included in the budget of a country's veteran affairs ministry (e.g. the US Department of Veterans Affairs).<sup>59</sup> SIPRI has historically not included veteran affairs expenses in its estimates of military expenditure (see box 2.1).

There are, however, arguments in favour of including spending on veterans in total military expenditure. Because SIPRI's definition of military expenditure tries to account for spending related to current military activities, it excludes components that are considered legacy costs of the military, such as disability compensation and war pensions (paid for injury or illness caused by service in the military). In contrast, the standard pensions of former troops are included in the definition of military spending since they are a necessary part of maintaining the military organization—without spending on pensions, it would not be possible to maintain an armed force.<sup>60</sup> The economic compensation paid to veterans affects the morale of the military and recognizes the contribution and sacrifices made by retired military cadres to the 'party, country and people' of China.<sup>61</sup>

Because the living allowances for veterans in townships and in rural areas help to maintain the structure of the military organization, spending on both should be included in the broader category of soldiers' demobilization and retirement payments outside the national defence budget. The data series for demobilization of veterans in townships starts in 2010 while that for the living allowance for soldiers who retire due to old age to rural areas starts in 2013.

#### *Additional military-related construction spending outside the national defence budget*

Wang considered that key military-related construction projects were funded from outside the official defence budget. This expenditure was to be found in the capital construction spending category of the yearly budget, but this item did not disaggregate civil and military costs. Wang estimated that the military-related share was about

<sup>59</sup> US Department of Veterans Affairs (VA), *Federal Benefits for Veterans, Dependents and Survivors* (VA: Washington, DC, 2019).

<sup>60</sup> Perlo-Freeman (note 6).

<sup>61</sup> Sina News, '老兵福音! 中国退役军人事务部成立意味着什么?' [Boon for veterans! What does the establishment of the Chinese Ministry of Veterans Affairs mean?], 13 Mar. 2018.

**Table 3.4.** Chinese local and central government expenditure on capital construction, 2016–19

Figures are million yuan.

	2016	2017	2018	2019
Total capital construction expenditure	477 600	507 574	537 600	577 585
Local	366 060	394 236	410 867	433 664
Central	111 540	113 338	126 733	143 921
Military-related expenditure	206	190	107	96
Military-related expenditure as a share of central capital construction expenditure (%)	0.18	0.17	0.08	0.07

*Note:* The figures are for actual expenditure as reported in the budget document for the subsequent year (e.g. the 2019 data comes from the 2020 budget document, the 2018 data comes from the 2019 budget document, etc.).

*Sources:* Chinese Ministry of Finance, Budget Department, Central capital expenditure budget tables for 2017, 24 Mar. 2017; 2018, 3 Apr. 2018; 2019, 1 Apr. 2019; and 2020, 17 June 2020 (all in Chinese).

5 per cent of total capital construction spending based on historical data on the period 1949–79.<sup>62</sup>

SIPRI used this 5 per cent average to estimate additional military construction spending for the years 1989–2006. However, the Chinese Government has not published information on capital construction since 2006. Estimates for 2007–19 have instead been based on China's average economic growth rate.

Newly obtained information shows that by 2019 the military-related share of capital construction was substantially lower than Wang's assumption of 5 per cent. It is thus necessary to revisit the estimate of additional military construction expenses. Additional military-related capital construction costs, disaggregated by military and civilian costs, have been found in the budget document on central capital construction expenditure among the Ministry of Finance's most recent budget documents. These figures are available for 2016–19. Based on this, in 2019 additional military-related capital construction spending was only 96 million yuan (\$14 million) or 0.07 per cent of central capital construction spending (see table 3.4). This is much less than the estimate of 69 billion yuan (\$10.1 billion) for additional construction spending in 2019 using the old assessment of Chinese military spending.

Data series for total capital construction spending for the period 2007–14 can be created from the available data on local capital construction spending. Local spending as a share of total capital construction spending was stable at around 75 per cent in 2014–19. Assuming a similar share going back to 2007, central and total government capital spending can be calculated for the period 2007–14.

The new estimate for military-related capital construction spending is based on three data series. First, it is assumed that the original estimate made by Wang for the period 1989–99 is correct and that the military-related share of capital construction is likely to have averaged around 5 per cent of total capital construction spending. Second, the series for the period 2016–19 is based on actual central military-related capital construction spending (see table 3.4). As a share of total central capital construction spending, this dropped from 0.18 per cent in 2016 to 0.07 per cent in 2019. Finally, for the remaining period, 2000–15, Wang's estimate of a 5 per cent share is assumed to no longer be valid based on the newly found information. Instead, this share is assumed to have declined substantially. Using the average annual change in military-related capital construction spending as a share of central government capital construction spending for the years 2016–19, a series for military-related spending can be estimated for the period 2000–15.

The new series improves on the previous reliance on the average economic growth rate and the assumption that the 5 per cent military share of capital construction

<sup>62</sup> Wang (note 4).





**Figure 3.1.** Estimated additional military-related construction expenditure outside China's national defence budget, 1989–2019

observed in 1949–79 is still relevant today. The new data series (see figure 3.1) follows an upward trend in the years 1989–1999 and thereafter a general downward trend with the exception of a spike in 2003. Part of this spike was caused by a government policy to boost infrastructure investment with the assumption that it also applied to military-related spending.<sup>63</sup>

### Categories for which lack of information prevents estimation

#### *Subsidies to loss-making arms companies*

Between 1949 and the late 1980s many of China's arms-manufacturing conglomerates operated at a loss.<sup>64</sup> State support to sustain these companies was vital in preserving some domestic arms-production capabilities.<sup>65</sup> According to Wang, the official national defence budget probably did not include the costs of direct subsidies to Chinese arms-production industries. These were instead likely to fall under the budget for industrial subsidies.

SIPRI's old estimate for subsidies to the arms industry was based on a share—16.5 per cent—of the total budget for industrial subsidies. This share was based on the proportion of Chinese industry represented by the arms-production sector (no more than one-third) and the likelihood that half of the subsidy (i.e. half of 33 per cent) was used to facilitate conversion from military to civilian production, leaving 16.5 per cent of the total budget for industrial subsidies to prop up loss-making arms-production companies.<sup>66</sup> From 2005, this share is assumed to have declined due to the increasing

<sup>63</sup> Chinese National Bureau of Statistics, '发展回顾系列报告之一: 大开放 大发展 大跨越' [Development review series 1: Great opening, great development, great leap forward], 27 Sep. 2007; Chinese National Bureau of Statistics, '发展回顾系列报告之四: 基础产业和基础设施建设成效显著' [Development review series 4: Remarkable achievements in basic industry infrastructure construction], 21 Sep. 2007; and Chinese National Bureau of Statistics, '新中国60年: 基础产业和基础设施建设取得辉煌成就' [60 years of new China: Brilliant achievements in basic industries and infrastructure construction], 15 Sep. 2009.

<sup>64</sup> Frankenstein, J., 'China's defense industries: A new course?', eds J. C. Mulvenon and R. H. Yang, *The People's Liberation Army in the Information Age* (RAND Corporation: Santa Monica, CA, 1999).

<sup>65</sup> Wang (note 4).

<sup>66</sup> Wang (note 4).

**Table 3.5.** Chinese Government subsidies to the China Electronics Technology Group Corporation (CETC), 2018–19

Figures are million yuan.

Government subsidy	2018	2019
<i>Other operating revenue</i> (其他收益)	3 089.04	3 132.76
Income tax return (收入税收返还)	1 852.30	1 625.39
Project grants (项目补助收入)	1 212.33	1 485.56
Job subsidy (稳岗补贴)	3.03	10.31
Rewards for talents (人才奖励)	7.47	5.41
High-technology grant (高新技术补助收入)	9.42	4.50
Safety production (安全生产补贴)	1.78	1.34
Funding (经费补助收入)	0.31	0.12
Training (培训补贴)	0.08	0.12
Research funds (课题经费)	2.30	–
Rewards (补贴奖励)	0.01	–
<i>Non-operating revenue</i> (营业外收入)	173.02	199.48
Government financial subsidies (政府财政补助)	24.30	114.25
Development supporting funds (扶持发展基金)	17.12	23.78
Policy programme (政策项目补助)	26.17	15.59
Technology special funds (科技专项资金)	3.16	10.55
Project funds (项目资金补助)	30.86	8.21
Innovation fund (创新基金)	3.32	5.36
Postdoctoral awards (博士后奖励基金)	4.26	3.25
Patent funds (专利资助)	1.50	3.03
Subsidies for small- and medium-sized enterprises (中小企业补助)	2.06	2.15
Cybersecurity E-commerce (网络安全电子商务)	14.77	–
Tax refund (退税款)	7.56	–
Research and development project grants (科研补助课题经费)	4.02	–
Others (其他)	33.93	13.32
<b>Total subsidy</b>	<b>3 262.06</b>	<b>3 332.24</b>

– = zero or negligible.

Source: CETC, 中国电子科技集团有限公司财务报表附注2019年年度报告 [China Electronics Technology Group Co., Ltd Financial Statements 2019 Annual Report] (CETC: Beijing, 30 June 2020), pp. 99–100.

profitability of most of the Chinese arms industry.<sup>67</sup> By 2009 the subsidies to loss-making arms companies are estimated to have been only 0.8 billion yuan. From 2010 onwards SIPRI assumed that this expenditure item was zero since these companies have gradually pursued profitability as a key objective and are no longer likely to be loss-making.<sup>68</sup> This effectively removed this spending item from SIPRI's estimate of total Chinese military spending.

However, further research has revealed evidence that some Chinese arms-manufacturing firms are still receiving a significant amount of government subsidy. For example, in 2016 the subsidies received by six unnamed Chinese arms-production companies reportedly accounted for more than half of their net profits.<sup>69</sup>

The China Electronics Technology Group Corporation (CETC) can be taken as an example. In its annual reports the item 'government subsidy' appears under 'non-operating revenue'. This item includes the subcategories 'government financial subsidies' from both central and local governments, 'R&D project grants', 'specific project grants', 'postdoctoral awards', 'development-support funds', 'research awards' and many others (see table 3.5).<sup>70</sup> CETC's 2018 bonds report shows that the subsidies it receives can vary by source. In 2018 the company received subsidies from the Ministry

<sup>67</sup> Bitzinger, R. A., 'Reforming China's defense industry', *Journal of Strategic Studies*, vol. 39, nos 5–6 (2016), p. 780.

<sup>68</sup> Zhang, Y. (张莹), '我国国防支出对军工企业绩效的实证分析' [An empirical analysis of the impact of China's defence expenditure on the performance of arms industry enterprises], *当代经济* [Contemporary Economics], no. 11, 2019, pp. 14–18.

<sup>69</sup> Xinhua, '169家公司政府补助超净利润50% 五大行业受宠' [169 companies with government subsidies exceeding 50% of net profit, five major industries favoured], 11 Apr. 2017.

<sup>70</sup> China Electronics Technology Group Corporation (CETC), 中国电子科技集团有限公司财务报表附注2019年年度报告 [China Electronics Technology Group Co., Ltd Financial Statements 2019 Annual Report] (CETC: Beijing, 30 June 2020), p. 101.

of Industry and Information Technology (MIIT), the National Development and Reform Commission (NDRC), and State Administration for Science, Technology and Industry for National Defence (SASTIND).<sup>71</sup> While it is clear that the grants from SASTIND are military-related, the grants from MIIT and the NDRC are probably for project-based non-military activities.

Since all the identified Chinese arms-production companies operate in both the civil and military markets, it is difficult to calculate the share of the subsidies that aims to support the companies' military division. In addition, further categories of subsidy for 'operating revenue' could include military activities: high-technology grants, technology special funds and innovation funds. However, they are all small in relation to China's total military expenditure (see table 3.5).

Since 2010 the Chinese Government has been trying to open up the arms industry to capital markets as a way to increase investment in the country's arm-production companies.<sup>72</sup> The Chinese arms industry has attracted substantial domestic investment interest. As illustrated in a 2017 report, Chinese arms-production companies have increasingly been able to acquire private sector funding through private and public bond and equity offerings.<sup>73</sup>

Overall, it can be concluded that the Chinese arms industry is profitable and competitive and that an influx of capital market investment has led to a decreased need for government subsidies. It is likely, however, that some military-related subsidies remain, although they appear to be insignificant in monetary value. But since military-related and civil subsidies cannot be distinguished, an estimate of military-related subsidies cannot be made. This supports SIPRI's decision, from 2010 onwards, to phase out and remove this item from the estimate of total Chinese military spending.

#### *Local spending on military research, development, testing and evaluation*

China's S&T spending is divided between central and local government. Including only central government spending on military-related S&T in the estimate of total military spending is therefore likely to exclude some expenditure. Since 2012, local government spending on S&T has been higher than central government spending; by 2018 local government S&T spending accounted for more than three-fifths of total spending.<sup>74</sup>

In the case of military RDT&E, most is likely to be funded by central defence spending, but a small proportion is probably paid for by local defence spending. Official local defence spending is about 2 per cent of central defence spending. Applying the same proportion to spending on military S&T suggests that about 3.5 billion yuan (\$500 million) of military-related spending by local governments is missing from the estimate of China's total military spending. However, it is not possible to separate military RDT&E spending from civil spending at the local level.

Without further information, SIPRI cannot include local spending on military S&T in its new estimate of Chinese military expenditure.

<sup>71</sup> CITIC Securities, '中国电子科技集团有限公司2018年面向合格投资者公开发行公司债券(第三期)募集说明书' [The prospectus of China Electronics Technology Group Co., Ltd for the issuance of corporate bonds (phase 3) to qualified investors in 2018 Bonds Report], 18 Dec. 2018, p. 4.

<sup>72</sup> Xinhua, 'China approves private investment in defense sector', *Global Times*, 19 July 2012; and Yang, Z., 'Privatizing China's defense industry', *The Diplomat*, 7 June 2017.

<sup>73</sup> Cheung, T., Anderson, E. and Yang, F., 'Chinese defense industry reforms and their implications for US-China military technological competition', Study of Innovation and Technology in China (SITC) Research Brief no. 2017-4, University of California Institute on Global Conflict and Cooperation (IGCC), Jan. 2017.

<sup>74</sup> Chinese National Bureau of Statistics, *China Statistical Yearbook 2019* (China Statistics Press: Beijing, 2019), section 7.3.

**Table 3.6.** China's spending on supporting the development of central infrastructure investment in frontier and minority areas, 2016–19

Figures are million yuan.

	2016	2017	2018	2019
Total central capital construction expenditure	111 540	113 338	126 733	143 921
Supporting the development of central infrastructure investment in frontier and minority areas	27 536	27 052	29 512	33 283

*Note:* The figures are for actual expenditure as reported in the budget document for the subsequent year (e.g. the 2019 data comes from the 2020 budget document, the 2018 data comes from the 2019 budget document, etc.).  
*Sources:* Chinese Ministry of Finance, Budget Department, Central capital expenditure budget tables for 2017, 24 Mar. 2017; 2018, 3 Apr. 2018; 2019, 1 Apr. 2019; 2020, 17 June 2020 (all in Chinese).

### *Military infrastructure in the South China Sea*

From the Chinese perspective, the expansion of islands in the South China Sea is a civilian operation.<sup>75</sup> Western publications on this topic tend to describe it as a militarized activity.<sup>76</sup> Military hangars, anti-aircraft missiles, runways and military-grade radar systems, among other things, have been installed.<sup>77</sup> The islands are off-limits to foreigners and are controlled by the PLA.<sup>78</sup> The militarization of the South China Sea may suggest that all or some of the costs of construction of these islands, if not already part of the official defence budget, should be included in estimates of China's military spending.

One Philippine news article—itsself based on a now unretrievable Chinese article—estimated that the expansion of one of the Spratly Islands cost around \$5 billion.<sup>79</sup> Nouwens and Béraud-Sudreau used this article to estimate the land-reclamation costs in the South China Sea at \$1 billion per island per year.<sup>80</sup> Another Chinese-language article estimated that expanding and militarizing Fiery Cross Reef cost 30 billion yuan (\$4.4 billion).<sup>81</sup> However, there is no indication as to how the author made this estimate, and the platform on which it was posted does not have a reputation for reliability.<sup>82</sup>

These were probably one-off costs, as most of the land-reclamation work is now completed and the main military facilities have been installed. Any further spending related to the militarization of the South China Sea islands is likely to be found under maintenance or residual construction spending.

Based on central infrastructure budget documents, one budget line item potentially related to the South China Sea is 'Supporting the development of central infrastructure investment in frontier and minority areas'. This item, which is reported as part of expenses transferred to local governments, amounted to 27–33 billion yuan (\$4–5 billion) per year in the period 2016–19 (see table 3.6).

The word 'frontier' (边疆) in the title of the line item helps interpretation of whether this budget category covers the militarization of islands in the South China Sea. This

<sup>75</sup> E.g. Agence France-Presse, 'South China Sea islands are only for civilian use, says Chinese general', *The Guardian*, 17 Oct. 2015.

<sup>76</sup> Stashwick, S., 'China's South China Sea militarization has peaked', *Foreign Policy*, 19 Aug. 2019; Poling, G. B., 'The conventional wisdom on China's island bases is dangerously wrong', *War on the Rocks*, 10 Jan. 2020; and Buckley, C., 'China suggests it has placed weapons on disputed Spratly Islands in South China Sea', *New York Times*, 15 Dec. 2016.

<sup>77</sup> This has been documented through satellite imagery, compiled and analysed by the Asia Maritime Transparency initiative of the Center for Strategic and International Studies (CSIS). CSIS has reported that other countries in the region (e.g. Viet Nam) have also set up military equipment on some of their territorial claims. Asia Maritime Transparency Initiative, 'Slow and steady: Vietnam's Spratly upgrades', CSIS, 8 Apr. 2019.

<sup>78</sup> Reuters, 'China building on new reef in South China Sea, think tank says', 21 Nov. 2018.

<sup>79</sup> Laude, J., 'Chinese military building artificial island', ABS-CBN News, 27 May 2014.

<sup>80</sup> Nouwens and Béraud-Sudreau (note 5).

<sup>81</sup> Awe of the Sea (海的敬畏), '同样是300亿, 为守护南海边疆, 填岛建机场和造航母哪个更有价值?' [Both are 30 billion: In order to protect the South China Sea, which is more valuable to build an airport or build an aircraft carrier?], Baidu, 19 June 2018.

<sup>82</sup> Fang, K., 'How Baidu learned to stop worrying and love the walled garden', *Sixth Tone*, 28 Jan. 2019.

designation applies to China's border regions, which include Hainan, and the South China Sea is administratively part of Hainan province.<sup>83</sup> Apart from the line item 'Supporting the development of central infrastructure investment in frontier and minority areas', no disaggregated information can be found for transfers to Hainan province for the construction of the South China Sea islands.

In addition to the above-mentioned frontier-support fund, in 2018 China established a special fund to support the reform and opening up of Hainan. Hainan received 10 billion yuan (\$1.4 billion) from this fund in 2019, and the budget for 2020 was 6.5 billion yuan (\$0.9 billion).<sup>84</sup> Part of this fund includes the promotion of civil–military integration. Related activities include strengthening coordinated development in the fields of infrastructure and S&T; improving the civil service facilities and functions of the South China Sea islands and reefs; improving the efficiency of both military and civil use of airspace; and meeting the demand for land for military use.<sup>85</sup> Part of the special fund can reasonably be seen as military-related, and more particularly related to activities in the South China Sea islands such as operations and maintenance. Unfortunately, there is no detailed indicator to help to estimate the proportion of this fund that is dedicated to military activities, and so it cannot be included in the new estimate of Chinese military expenditure.

<sup>83</sup> Haver, Z., 'Sansha and the expansion of China's South China Sea administration', Asia Maritime Transparency Initiative, Center for Strategic and International Studies (CSIS), 12 May 2020; Lo, K., 'Beijing moves to strengthen grip over disputed South China Sea', *South China Morning Post*, 18 Apr. 2020; and Neill, A., 'South China Sea: What's China's plan for its Great Wall of sand?', BBC News, 4 July 2020.

<sup>84</sup> Chinese Ministry of Finance, Budget Department, '关于支持海南全面深化改革开放补助资金的说明' [Note on support for Hainan's comprehensive and deepening reform and opening-up subsidies], p. 73; and Chinese Ministry of Finance, Budget Department, Central capital expenditure budget tables for 2020, 17 June 2020 (in Chinese).

<sup>85</sup> Xinhua, '中共中央 国务院关于支持海南全面深化改革开放的指导意见' [Guiding opinions of the Central Committee of the Communist Party of China and the State Council on supporting Hainan's comprehensive deepening of reform and opening-up], 14 Apr. 2018.

## 4. The new estimate of Chinese military expenditure

In revising the approach to estimating Chinese military expenditure, this report assesses 10 possible additional components outside the official national defence budget: two to be either phased out or excluded from the SIPRI estimate; five to be revised or newly included in the SIPRI estimate; and three for which too little information is available to make an estimate.

As well as the official national defence budget, the new estimate of Chinese military spending is made up principally of five additional spending categories: (a) the People's Armed Police; (b) the China Coast Guard; (c) payments to demobilized and retired soldiers; (d) additional military research, development, testing and evaluation spending; and (e) additional military construction spending. These additional spending categories totalled 448 billion yuan in 2019, accounting for 27 per cent of total estimated Chinese military spending of 1660 billion yuan (see annex 1).<sup>86</sup>

The largest additional item is RDT&E spending, which in 2019 amounted to 172.6 billion yuan (\$25.0 billion) or 10 per cent of the total. Demobilization, retirement and pension payments is the second largest item at 139.9 billion yuan (\$20.3 billion) in 2019, 8.4 per cent of the total. The PAP, which was the largest additional item under the old SIPRI estimate, is now the third largest item, with a total budget in 2019 of 123.6 billion yuan (\$17.9 billion), accounting for 7.4 per cent of total estimated Chinese military expenditure. Military-related spending in 2019 on the CCG is estimated to have been 11.1 billion yuan (\$1.6 billion), 0.7 per cent of the total, and spending on additional military construction expenses is estimated at 0.1 billion yuan (\$14 million), less than 0.01 per cent of the total.

The most obvious change between the new and old SIPRI estimates of China's military expenditure is the new CCG category. The biggest effect on the total estimate was made by changes to the PAP figures. The removal of non-military activities from the PAP in 2019 meant a substantial downward revision was needed for the period 1989–2018. The new estimate of PAP spending in 2018, at 122.9 billion, is 82.7 billion yuan lower than the old estimate. Another major change is in additional military construction: in 2019 spending of 69.4 billion yuan under the old estimate is revised down to 0.1 billion yuan, as found in official budget documents. Similarly, the 2019 estimate of payments for arms imports outside the defence budget is revised down from 10 billion yuan to only 0.5 billion yuan. From 2020 this category will be assumed to be entirely part of the official budget.

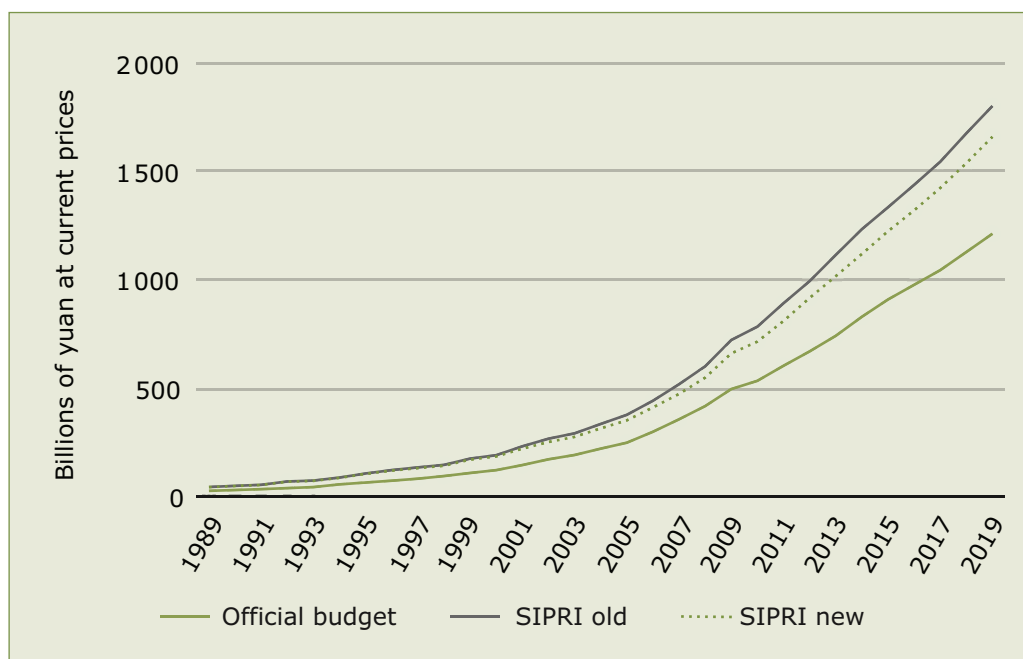
Only one category is revised upwards: payments to demobilized and retired soldiers. Under the new SIPRI estimate, this category is 25 per cent higher than the old estimate.

The new estimate of Chinese military expenditure in 2019 is 1660 billion yuan (\$240 billion). This is 142 billion yuan less than the old SIPRI estimate but 448 billion yuan more than the official national defence budget (see table 4.1). With the new estimate of \$240 billion in 2019, China remains the second largest military spender in the world (behind the USA) and its spending is still almost three-and-a-half times higher than the next largest spender, India. China's military burden—that is, military spending as a share of GDP—is now 1.7 per cent, down from 1.9 per cent under the old estimate. Military spending as a share of total government spending falls from 5.4 per cent to 5.0 per cent.

Comparing the three time series—the official budget and the old and new SIPRI estimates—over the period 2010–19 shows that the new estimate is only about

<sup>86</sup> The 448 billion yuan also includes the arms imports category that will be phased out from 2020.





**Figure 4.1.** Chinese military expenditure according to the official budget and the old and new SIPRI estimates, 1989–2019

Sources: Chinese State Council, 新时代的中国国防 [China's national defence in the new era], Defence White Paper (Chinese State Council Information Office: Beijing, July 2019); and SIPRI Military Expenditure Database, May 2020, <<http://sipri.org/databases/milex>>.

**Table 4.1.** Chinese military expenditure according to the official budget and the old and new SIPRI estimates, 2010–19

Spending figures are billion yuan at current prices.

	Official national defence budget	Old SIPRI estimate	New SIPRI estimate	New SIPRI estimate as a share of old estimate (%)	New SIPRI estimate as a share of GDP (%)
2010	533.3	783.4	714.4	91	1.7
2011	602.8	891.5	809.5	91	1.7
2012	669.2	993.5	916.1	92	1.7
2013	741.1	1 114	1 017	91	1.7
2014	829.0	1 233	1 119	91	1.7
2015	908.8	1 335	1 224	92	1.8
2016	976.6	1 438	1 320	92	1.8
2017	1 044	1 545	1 424	92	1.7
2018	1 128	1 676	1 538	92	1.7
2019	1 213	1 803	1 660	92	1.7

GDP = Gross domestic product.

Sources: Chinese State Council, 新时代的中国国防 [China's national defence in the new era], Defence White Paper (Chinese State Council Information Office: Beijing, July 2019); and SIPRI Military Expenditure Database, May 2020, <<http://sipri.org/databases/milex>>.

1.36 times higher than official spending, compared to 1.48 for the old estimate (see figure 4.1).

Building on SIPRI's old estimate and contributions by other scholars in the field, the new estimate provides a more accurate figure for China's military expenditure. It accounts for the shifts in the country's economy and defence policies since Wang's initial assessment in 1999.<sup>87</sup> Whereas China's official figures in the 1980s and 1990s were considered too low and unrealistic—leading to efforts to find 'off the books' spending—official defence spending has increased tenfold since 2000, in line with

<sup>87</sup> Wang (note 4).

economic growth.<sup>88</sup> This suggests an increased likelihood that some of the spending outside the official defence budget now either no longer exists or is part of the official defence budget. This is epitomized by the substantial revision in the estimate of additional military-related construction spending.

It is noteworthy that the gap between the official Chinese national defence budget and the spending estimates made by the US DOD is also decreasing. Since the DOD has historically always estimated actual Chinese spending to be much higher than the budget, the decreasing gap is a further sign that a growing share of China's spending on military activities is now in the official national defence budget.<sup>89</sup>

<sup>88</sup> Cordesman, A. H. with Kendall, J., 'Estimates of Chinese military spending', Center for Strategic and International Studies (CSIS), Sep. 2016.

<sup>89</sup> E.g. US Department of Defense (note 1); and US Department of Defense (note 48). See also Liff and Erickson (note 9), pp 805–30.



## 5. Conclusions

Updating the estimate of Chinese military expenditure was much needed—and achievable. Due to the lack of transparency in military activities, any attempt to measure actual Chinese military expenditure must rely in part on estimates. The new SIPRI approach to estimating Chinese military expenditure improves on the old method. The new series remains consistent over the period 1989–2019; the figures for recent years are on average about 1.36 times larger than the official national defence budget. At 1660 billion yuan or \$240 billion in 2019, the new SIPRI estimate is slightly lower than the old estimate of 1803 billion yuan or \$261 billion.

Similarities in the two estimates offer insight into the general understanding of Chinese military spending. The largest off-budgetary items—such as soldiers' demobilization and retirement payments and the PAP—are already well-defined and included in the SIPRI estimate.

One key takeaway is the importance of continuous monitoring and assessment of a country's military spending. Changes in defence and economic policies can have a significant effect on military activities and how they are accounted for. Some expenses that were considered extra-budgetary in the 1990s or 2000s had probably become part of the official budget by 2019. New categories were added while others were removed. As the PLA's structure and activities change, so too does SIPRI's assessment of the specific expenditure categories that make up SIPRI's estimate of China's military spending.

Nonetheless, some spending categories still require additional research. There is still no transparency in budgeting and spending for military R&D. Unless substantial changes are made to the reporting of budgets and actual spending on R&D, military-related RDT&E spending will remain an estimate. The lack of disaggregation of construction spending on the South China Sea islands also leaves a question mark over the spending category of additional military-related construction. The revised figure for this category is probably an underestimate, but this could range from as little as a few hundred million yuan up to a few billion yuan. The absence of accurate information on China's expenditure on military activities in the South China Sea has important implications for security developments in that region.

Future research should also focus on improving the precision of existing figures. Information from publicly available Chinese-language sources provides important insight into known and unknown possible military activities. This would allow for incremental improvements to the estimate of Chinese military spending over time and by different teams of researchers.



Total (yuan b.)	47.5	103.4	184.1	350.6	714.4	809.5	916.1	1 017	1 119	1 224	1 320	1 424	1 538	1 660
Total (US\$ current b.)	9.9	12.4	22.2	42.8	105.5	125.3	145.1	164.1	182.1	196.6	198.5	210.4	233.1	240.3

[ ] = estimated figure; - = zero or negligible; PLA = People's Liberation Army; RDT&E = research, development, testing and evaluation.

Sources: SIPRI Military Expenditure Database, May 2020, <<https://www.sipri.org/databases/milex>>; and Chinese Ministry of Finance, Budget Department, <<http://yss.mof.gov.cn/>>.



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