Contemporary Trends in Militarisation



Military Expenditure Militarisation Composition









Quantifying Peace and its Benefits

The Institute for Economics & Peace (IEP) is an independent, non-partisan, non-profit think tank dedicated to shifting the world's focus to peace as a positive, achievable, and tangible measure of human well-being and progress.

IEP achieves its goals by developing new conceptual frameworks to define peacefulness; providing metrics for measuring peace; and uncovering the relationships between business, peace and prosperity as well as promoting a better understanding of the cultural, economic and political factors that create peace.

IEP is headquartered in Sydney, with offices in New York, Brussels, The Hague, Mexico City and Nairobi. It works with a wide range of partners internationally and collaborates with intergovernmental organizations on measuring and communicating the economic value of peace.

For more information visit www.economicsandpeace.org

Please cite this report as:

Institute for Economics & Peace. Contemporary Trends in Militarisation: Exploring Military Capacity and Capability, Sydney, July 2024. Available from: http://visionofhumanity.org/resources (accessed Date Month Year).

Contents

Executive Summary



2

Overview	5
Long-term Trends in Militarisation	5
Recent Trends in Militarisation	8
Military Expenditure	8
Armed Forces Personnel	10

2 The Changing Shape of Militarisation

Changes in Militarisation Composition	13
Trends in Military Capability	16

Appendix A: Country Changes in Military Expenditure and Armed Forces, 2008–2023 19

Executive Summary

This report provides two new approaches to understand the capabilities of the world's militaries by country. The first analyses and tracks changes in a range of militarisation indicators. The main finding of this approach is that while military expenditure is rising in absolute terms, as a percentage of GDP it has fallen and is around half of the peaks seen at the height of the Cold War. Concurrently, as military sophistication increases, troop numbers are declining, highlighting a growing reliance on technology.

The second approach is the development of a new and original methodology that calculates the military capacity of countries by weighting the generations of their military assets. These capability scores substantially change the ranking of countries when compared to traditional approaches that count just the number of military assets, or compare military expenditure. The US has the highest capability score, well ahead of China, which ranks second. Russia follows China closely in third. Countries such as Iran and North Korea, despite having large fleets of fixed wing planes, drop considerably in the rankings, because their assets represent older technology.

These trends occur as the world is at a crossroad with the number of conflicts, 59, at an all-time high since WWII. These conflicts are becoming more internationalised, with 92 countries involved in a conflict beyond their borders, rising competition between the major powers, and more middle level powers also becoming more assertive. Unresolved conflicts are at the highest levels since WWII, opening more opportunity for major conflicts to erupt.

Trends and Impacts

In response to global instability, national and global military expenditures have been steadily increasing. In 2023, global military expenditure reached a record high of \$2.443 trillion USD, marking a 6.8 per cent surge from the previous year. This rise is driven by reactions to the ongoing conflict in Ukraine and escalating geopolitical tensions in Asia, Oceania, and the Middle East¹. In 2023 the Global Peace Index recorded that 104 countries had increased their militarisation, the largest number since the inception of the Index in 2008.

In terms of military expenditure as a percentage of GDP, it had been gradually falling for the first 14 years of the Global Peace Index. However, this trend reversed in 2022 after the invasion of Ukrainian war. In 2023 military spending as a percentage of GDP increased in 86 countries compared to 50 where it decreased.

Broadly, increases in military spending divert funds away from other public goods such as education, health and business development. Studies have shown that higher military expenditures are negatively associated with developmental indicators of health, wealth and education. Conversely, they are positively correlated with mortality and poverty rates, and air pollution.² This is due to the reallocation of funds away from healthcare and infrastructure towards the military.

Despite rising military expenditures, the total number of military personnel globally has fallen from over 30 million in 1995 to under 28 million in 2020, in line with increased technological capabilities. On a per capita basis, the decrease is even more pronounced, dropping from close to 700 per 100,000 people in the early 1970s, to 350 in 2020. Countries are allocating more funds to their militaries, yet the number of service members is at an all-time low.

Key findings from the study include:

- **Government Spending:** Military spending as a percentage of total government spending fell from over 10 per cent in 2000 to less than 7.5 per cent in 2021. However, in both absolute and per capita terms, military spending has increased since the end of the Cold War.
- Less Concentration in Military Capabilities: The relative share of global military capabilities is now more dispersed. The permanent members of the UN Security Council account for less than 50 per cent of global material capability, down from 75 per cent at the end of WWII.
- Long-term Trends: There has been a decline in the number of military personnel over the past three decades, and a decline in relative military spending since the 1960s.
- Recent Increases in Military Spending. Since 2008 the average level of country militarisation had been gradually reducing. This reversed in 2022 and militarisation is expected to increase over the next five years.
- Drivers of Militarisation Decline: Two main drivers have been identified for the fall in militarisation since the end of the Cold War: a relative decrease in the priority given to military spending compared to other sectors, and an increasing emphasis on high-tech warfare.
- Decline in Military Personnel: The number of armed forces personnel has fallen in most countries. The total number of military personnel globally decreased from over 30 million in 1995 to under 28 million in 2019, in line with increases in technological capabilities. India was the only major power to see an overall increase in its total number of troops, though its number of troops as a percentage of the labour force remained constant. The US, Russia, and China all recorded significant declines in total troop numbers.

SIPRI. "Trends in World Military Expenditure, 2023," 2023. https://www.sipri.org/sites/default/files/2024-04/2404_fs_milex_2023.pdf [Accessed 9 July 2024].
 Elgin, Ceyhun, Adem Y. Elveren, Gökçer Özgür, and Gül Dertli. "Military Spending and Sustainable Development." Review of Development Economics 26, no. 3 (August 2022): 1466–90. https://doi.org/10.1111/rode.12893.

Introducing the Military Technological & Capability (MTC)

Economic expenditures are often used as a proxy to compare countries based on their material power.³ However, as technology improves over time, solely assessing military power through their assets does not capture what countries' capabilities are. Today, one dollar spent procures much more advanced equipment than it did in the 1990s.

The evolving landscape of warfare has led to the development of more sophisticated and powerful weapon platforms that are smaller and relatively less expensive. For example, Ukraine's use of FPV drones has proven effective against Russia's formidable artillery forces. This shift may help explain the counter trends of increasing military spending alongside reduced personnel numbers. Technological substitution may be reducing the need for larger armed forces.

Comparing countries based solely on military expenditure or numbers of weapons overlooks the advancing sophistication of technology and does not necessarily reflect the true capabilities of a country. Much has been written about the increase in China's naval platforms over the past decade, but military analysts highlight that the US fleet remains far more capable. Similarly, while North Korea's and Iran's air forces boast significant numbers, their aircrafts are mostly outdated and equipped with old technology. A fifth generation aircraft is estimated to be significantly more capable than a third or even a fouth generation one.

To address these gaps, the Institute for Economics & Peace (IEP) has developed an original approach to measuring the global capabilities of the world's military: the Military Technological & Capability (MTC) Score. The score is calculated by country and considers not only the number of military assets but also their technological generation. By weighting the assets based on their generations, it provides a better understanding of how countries spend their military budgets and how these capabilities compare between countries.

The MTC provides an important complement to traditional measures of military strength. While technological advancements do not guarantee battlefield dominance, they significantly shape the nature of warfare. Key Findings from the introduction of the MTC include:

- Technological Advancement: Total military capability scores have increased by 10 per cent over the last decade when technological advancement is factored in.
- Changes in Military Assets: This increase was not constant across platforms. Over the past decade, fixed wing capability scores increased by 20 per cent, followed by a six per cent increase in naval asset scores. In comparison, rotary wing, artillery and armoured capabilities have remained stable since 2014.
- Country-Specific Trends: From a technological
 perspective, the United States remains the country

with the largest military capability score, possessing the largest overall military capability across the key weapon categories of fixed-wing, rotary-wing, naval, and armoured vehicle assets. China's score places it second and well behind the US. Russia closely follows China.

- Largest Increase: Globally, China's score has had the largest increase, growing by over 71 per cent in the past decade and surpassing Russia's rank in 2021.
- Regional Increases: Over the same period, the 20 countries with the largest absolute increases in score are predominantly from Asia and the MENA region, highlighting intense militarisation trends in these areas. Outside of the superpowers, the three largest absolute increases in score have been in South Korea, Saudi Arabia and Egypt.

Conclusion

Against this backdrop of an increasing level of global militarisation, IEP releases its first report on trends in militarisation, examining underlying trends in military expenditure and introducing the MTC, an innovative approach that accounts for technological advancement in assessing global militarisation. By tracking the evolution of military technologies as a complement to military spending, the MTC will provide a more accurate approach to assessing power balances.

Overview

Key Findings

4

- Data from the Global Peace Index shows that the average level of country militarisation has been declining, even as the level of conflict around the world has increased substantially.
- The fall in militarisation has not been consistent across every indicator that measures military capability. While the armed forces rate and relative military spending have been falling in most countries, total military spending and overall military capability, especially related to the use of technology, has been increasing.
- This is a continuation of a longer-term trend over the past three decades that has seen both the number of military personnel and relative spending on the military decline since the 1960s, while per capita military spending and military sophistication has increased.
- There appear to be two drivers of the fall in militarisation since the end of the Cold War: a relative fall in the priority given to military spending compared to spending in other sectors, and an increasing emphasis on high-tech warfare.
- Military spending as a percentage of total government spending fell from over ten per cent in 2000 to less than 7.5 per cent in 2022. However, in both absolute and per capita terms the level of military spending has increased since the end of the Cold War.

- Total military capability has increased by 10 per cent over the last decade when technological advancement is factored in.
- The relative share global of military capabilities is more dispersed. The permanent members of the UN security now account for less than 50 per cent of global material capability, down from 75 per cent at the end of WW2.
- The number of armed forces personnel has fallen in most countries. The total number of military personnel globally has fallen from over 30 million in 1995, to under 28 million in 2019 in line with the increases in technological capabilities.
- India was the only major power to see an overall increase in its total number of troops, however its number of troops as a percentage of the labour force remained constant. The US, Russia, and China all recorded large falls in total troop numbers.
- From a technological perspective, the US remains the country with the largest military capability, followed by China and Russia.

Overview

The Global Peace Index (GPI) is the world's leading measure of global peacefulness and has been measuring peacefulness at the national level since 2008. It measures peacefulness across three domains: *Safety and Security, Ongoing Conflict,* and *Militarisation.* One of the more puzzling trends in peace that the GPI has revealed is a decline in the average level of country militarisation, even as the level of conflict has increases dramatically and the world has become considerably less peaceful.

The contrast between the improvement in militarisation and the deterioration in the other GPI domains is shown in figure 1.1. While overall peacefulness has deteriorated by over five per cent since 2008, the average country score on the militarisation domain improved, driven mainly by falls in the armed forces rate as well as small decreases in military expenditure as a percentage of GDP.

There are several possible reasons why militarisation has decreased, even as the level of conflict around the world has increased dramatically. Firstly, this may be the result of a shift in government priorities away from military spending and towards other areas like education or health. Secondly, it might be the result of a move away from troop recruitment towards a stronger emphasis on military capability and technological sophistication. Militarisation is usually expressed in terms of percentage of GDP spent on the military, absolute expenditure, or total numbers of weapons or soldiers. There is little publicly available research that assesses military capacity based on weapons systems complexity and sophistication. The military capability data in this report is based on a new methodology that incorporates technological sophistication and combat readiness into an overall measure of military capability. This allows for a more comprehensive understanding of the changing dynamics of militarisation.

LONG-TERM TRENDS IN MILITARISATION

Military Expenditure

Data for military expenditure as a percentage of GDP is available for many countries back to 1960. Figure 1.2 shows these estimates for the permanent member states of the UN security council (the US, UK, France, Russia, and China), as well as an estimate of global military expenditure over the same period.

FIGURE 1.1

Indexed GPI trend by domain, 2008–2024

Militarisation was the only GPI domain to record an improvement since 2008.



Source: IEP

FIGURE 1.2

Military expenditure as a percentage of GDP, selected countries (1960-2022)

Global military expenditure as a percentage of GDP has fallen by over four percentage points in the past 60 years.



Source: SIPRI, IEP Calculations

Global military expenditure as a percentage of GDP has fallen considerably over the past sixty years, from over six per cent in 1960 to just over two per cent in 2022. The most noticeable fall was in the US, where military expenditure now accounts for less than four per cent of GDP, down from over nine per cent in 1960. Whilst comparable data for the USSR is not available, best estimates suggest that there was a similar fall from 1960 until the end of the Soviet Union.

Chinese military expenditure has remained relatively constant as a percentage of GDP and has been below two per cent of GDP since 2004. However, China has experienced tremendous economic growth over this period, meaning that in real terms total Chinese military expenditure increased massively over the same period. Expressed in constant 2022 US dollars, total Chinese military expenditure rose from 23.5 billion to 299 billion, an increase of 1,272 per cent.

Armed forces personnel

The drop in military expenditure since WWII was mirrored by a similar drop in the armed forces rate, although the trends diverged in 1995 with military expenditure as a percentage of GDP dropping only slightly while the number of armed service personnel continued to decline.

Whilst data is not available for every country in the world, comparable data exists for 106 countries from 1960 onwards. This data has been used to estimate a trend in the global armed forces rate, shown in figure 1.3.

FIGURE 1.3

Global armed forces personnel rate, 1960–2016





Source: Correlates of War

According to this estimate, the global armed forces rate per 100,000 people fell from close to 700 per 100,000 in 1970, to just over 250 per 100,000 in 2016. The majority of this fall in the armed forces rate occurred in the Soviet Union/Russia and the US, where the armed forces rate fell by 78 per cent and 40 per cent respectively.

7

Trends in Hard Power

Although there has been a clear fall in the level of militarisation over the past 60 years, the potential for increases in militarisation in the near future remains high. One measure of the potential for militarisation is 'hard power', a country's potential to use military and economic means to rapidly build military capacity. The *Correlates of War* hard power measure, known as the 'material capabilities' indicator, is a weighted combination of military expenditure, armed forces personnel, total population and industrial production. The relative global composition of hard power from 1940 to 2016 is shown in figure 1.4.

The relative share of hard power held by the US and the EU has been declining since the end of the second world war. The EU now has only five per cent of the world's national material capabilities, while the US holds under 15 per cent, down from nearly 40 per cent 80 years ago. By contrast, China's share of hard power is now approaching 25 per cent.

The shift in the distribution of hard power can be seen by looking at the relative shared held by UN security council members versus the rest of the world, as shown in figure 1.5.

FIGURE 1.5

Distribution of hard power, permanent members of the UN Security Council vs. the rest of the world, 1940–2016

The share of national power held by permanent UN security council members has fallen from 75 per cent at its peak to less than 50 per cent per cent in 2016.



FIGURE 1.4

National hard power as a percentage of global power for major powers, 1940-2016

China now accounts for almost a quarter of total national power capacity.



Source: Correlates of War

Over half of national material capability or hard power is now held by countries that are not permanent members of the UN security council. This is a reflection that many countries are increasing their industrial capacity, while recording strong population growth, and increasing the size of their militaries relative to the more established military and economic powers. However, this trend has reversed slightly since 1990, as China's rapid increase in both manufacturing capacity and military expenditure per capita led to a slight increase in hard power for security council members.

RECENT TRENDS IN MILITARISATION

Much more detailed data is available on militarisation for the past 30 years. Military expenditure as a total, per capita, and as a percentage of GDP is available for almost every country in the world over this period. Similar data coverage is also available for total armed forces, the armed forces rate per 100,000 people, and armed forces as a percentage of the total labour force.

MILITARY EXPENDITURE

Total Military Expenditure

Total global military expenditure has almost doubled over the past quarter of a century. When measured in constant 2017 USD, military expenditure increased from just over one trillion in 1995, to two trillion dollars in 2022. This is an increase in real terms of 87.6 per cent in 26 years.

FIGURE 1.6

Total global military expenditure, 1995–2022

Total military expenditure has almost doubled in the past 25 years.



Source: SIPRI, World Bank, IEP Calculations

Historically, North America, Europe, and the Soviet Union accounted for the majority of global military expenditure. Immediately following the end of the Cold War, North America, Europe, and Central Asia, which includes Russia and the former Soviet states, accounted for almost three-quarters of the global military expenditure. However, their share of the total has gradually decreased over time, reaching just under 60 per cent in 2022.

By contrast, the Asia Pacific region and South Asia have experienced a significant increase in their share of total military expenditure. This gradual shift can be attributed to the sustained and robust economic growth over the past quarter-century of these two regions. The combined share of global military expenditure accounted for by both regions increased from 15 per cent to 28 per cent, largely as a result of increased military spending in China and India, as show in table 1.1.

TABLE 1.1

Ten largest military spenders (constant 2017 USD) in 1995 and 2022

Four of ten highest military spenders in 2022 were from the Asia-Pacific or South Asia regions, compared to just two in 1995.

1995			2022		
Rank	Country	Military Expenditure (billions)	Rank Country		Military Expenditure (billions)
1	United States	442	1	United States	736
2	UK	58	2	China	282
3	France	52	3	India	75
4	Germany	39	4	UK	69
5	Japan	36	5	Russia	63
6	Saudi Arabia	32	6	France	52
7	China	32	7	Japan	49
8	Russia	28	8	Germany	49
9	Italy	25	9	South Korea	48
10	Brazil	20	10	Saudi Arabia	46

9

Per Capita Military Expenditure

Per capita military expenditure also increased over the past quarter of a century, albeit to a lesser extent than total expenditure. In constant 2017 USD, global per capita military expenditure was just under 190 dollars in 1995. By 2022 it was approaching 260 dollars per person.

FIGURE 1.7

Global military expenditure per capita, 1995–2022

Military expenditure per capita in constant USD terms has increased by 37 per cent since the end of the Cold War.





Military Expenditure as a Percentage of GDP

Most analysis on military expenditure focuses on spending as a percentage of gross domestic product (GDP), which gives a sense of military spending as a proportion of all economic activity. Measured in percentage of GDP terms, global military expenditure has remained almost constant over the past 25 years, although it has fallen slightly since 2010, as shown in figure 1.8.

FIGURE 1.8

Global military expenditure as a percentage of GDP, 1995–2022

Military spending relative to economic activity has fallen 0.4 percentage points since 1995.



Source: SIPRI, World Bank, IEP Calculations

PPP Military Expenditure

In all calculations and estimations conducted thus far, military expenditures have been consistently evaluated using constant USD. This way of estimation has its own advantages and limitations. The key advantage is that it allows for comparing and contrasting military capabilities and outputs across countries. The main limitation is that it understates the amount of economic resources committed to the military especially in countries such as India and China where a dollar of military spending goes further.

Estimating military expenditure in PPP terms, alongside the conventional practice of using constant US dollars provides additional insights into the nature of military spending. Figure 1.9 compares the global military trend in both constant 2017 USD and constant PPP 2017 international dollars.

FIGURE 1.9

Military expenditure in constant PPP int. dollar vs. constant USD, 1995-2022

Military expenditure in PPP constant 2017 international dollar exceeds constant 2017 USD by a factor of 1.5.



Source: SIPRI, World Bank, IEP Calculations

In highly economically developed countries, the gap between military expenditure in constant USD and PPP constant international dollars is negligible. However, the gap in less economically developed countries is considerable. For example, the utilisation of GDP-level PPP shows that military expenses in a country such as India could be as high as \$247 billion, more than three times greater than when expressed using the market exchange rates. This signifies that the Indian economy incurred higher actual costs, indicating that the economic burden of military expenditure in India was more than three times higher than in the UK, as shown in table 1.2. It represents the volume of resources, measured in terms of PPP, that could have been allocated to other purposes.

TABLE 1.2

PPP-USD ratio of military expenditure in five largest military spenders in 2022

Rank	Country	Military Expenditure (PPP billions)	Military Expenditure (Constant USD billions)	Ratio (PPP/USD)
1	United States	736	736	1.00
2	China	432	282	1.53
3	India	247	75	3.29
4	UK	67	69	0.97
5	Russia	166	63	2.63

ARMED FORCES PERSONNEL

Total armed forces personnel

The total number of armed forces personnel in the world fell from over 30 million in 1995, to under 28 million in 2022, as shown in figure 1.10. The majority of this decrease occurred in Russia, China, and the US, although most countries in the world recorded a decrease over this period. The only major military power to record a substantial increase in the size of its armed forces over this period was India, which increased its number of troops by over 40 per cent.

FIGURE 1.10

Total armed forces personnel and country indexed trend, 1995–2019

The total number of armed forces personnel fell from over 30 million in 1995 to under 28 million in 2019.



Source: IISS, World Bank, IEP Calculations

Armed Forces Rate

The fall in the number of overall armed forces personnel was mirrored by the drop in the global armed forces rate, which decreased from just under 500 per 100,000 people in 1995, to just over 325 per 100,000 in 2019, as shown in figure 1.11.

FIGURE 1.11

Global armed forces rate, 1995–2019

The armed forces rate fell from over 450 to less than 350 between 1995 and 2019.



Source: IISS, World Bank, IEP Calculations

Percentage of The Labour Force

The size of the armed forces also decreased when measured as a percentage of the total labour force, as shown in figure 1.12. Just over 0.8 per cent of the world's labour force was employed by their country's armed forces in 2019, compared to nearly 1.3 per cent in 1995. The US and France both have a military that comprises less than one per cent of the total labour force, while in the UK and China it is less than half a per cent. Russia is the only permanent member of the security council with two per cent or more of the labour force employed by the armed forces as of 2019. India, which had the most substantial increase in total armed forces of any major power, remained constant in terms of percentage of the labour force.

The total number of military personnel globally has fallen from over 30 million in 1995, to under 28 million in 2019 in line with the increases in technological capabilities.

FIGURE 1.12



Less than one per cent of the labour force globally now works in the military.



Source: IISS, World Bank, IEP Calculations

2 The Changing Shape of Militarisation



It seems clear from both the long and short-term trends that there has been a real and sustained decline in militarisation that began almost 60 years ago. However, over the past 25 years the picture has become much more complex. While military expenditure as a percentage of GDP has fallen slightly, and troops per 100,000 of population continues to decline, total expenditure on the military continues to rise while military sophistication continues to increase.

This section looks at two possible causes of the decline: a social shift in priorities away from military spending to other forms of government spending, and a policy shift away from the use of infantry, towards a more high-tech and sophisticated military.

THE PRIORITY OF MILITARISATION

Figure 2.1 shows the average level of military spending as a percentage of total government spending, along with the equivalent figures for both education and health spending. There has been a clear decline in military expenditure using this metric, from an average of over 10 per cent in 2000, to less than 7.5 per cent in 2020. By contrast, spending on health has risen from 5.1 per cent to 7.3 per cent, and is now higher on average than military expenditure. Education spending has remained almost constant over the same period.

The shift away from military expenditure and towards health expenditure can be seen across countries at all levels of peacefulness, as shown in figure 2.2. Countries across all peace bands recorded increases in health expenditure of around 20 per cent at least, with military spending falling by 20 per cent as a percentage of government expenditure. The largest shifts occurred in countries with both very high and very low levels of peacefulness, although there was not a great deal of variation across the different peace bandings for both health and military expenditure. Low peace countries recorded the smallest increase in health expenditure, but the largest average increase in education expenditure.

> Military spending as a percentage of total government spending fell from over ten per cent in 2000 to less than 7.5 per cent in 2022.

FIGURE 2.1

Relative government spending on military, education, and health, 2000-2022

Military spending as a percentage of total government expenditure has fallen from over 10 per cent in 2000 to just over 7.5 per cent in 2022.



Source: World Bank, IEP Calculations

FIGURE 2.2

Very High High Medium 140 120 100 80 **NDEXED TREND** 60 2000 2005 2010 2015 2020 Low Very Low 140 120 Education 100 Health Milex 80 60 2000 2005 2010 2015 2020 2000 2005 2010 2015 2020

Relative spending on the military and education by level of peacefulness, 2000–2022 Military spending has fallen considerably in countries with low and very low levels of peace.

Source: World Bank, IEP Calculations

CHANGES IN MILITARY COMPOSITION

The other possible cause of the decrease in militarisation is a shift away from a reliance on troops and towards militaries with greater technological sophistication. Throughout history, military expansion has generally involved increased spending and a subsequent surge in military and defence recruitment. This correlation between bolstering military capabilities and allocating greater resources to hiring and maintaining armed forces has been a consistent pattern. A prominent example of this occurred during the Cold War, where heightened military expenditures led to an immediate enlargement of the US armed forces personnel. However, in recent times, this association has weakened and, in some cases, completely reversed. Data from the past 25 years indicates that while in certain countries and regions the correlation remains relatively strong, in others, there has been a decoupling or even a reversal of the relationship between military spending and armed forces personnel. This essentially means that expanding a military does not necessarily require recruiting more individuals.

Military Expenditure vs Armed Forces Rate

FIGURE 2.3

Change in military expenditure as a percentage of GDP vs change in armed forces rate, 2006–2019

There is no correlation between changes in military expenditure and changes in the armed forces rate.



Source: IISS Military Balance, IEP Calculations

The decoupling of military spending and armed forces expansion is shown in figure 2.3, which shows the correlation between these two variables for the change over the period 2006-2019, roughly from the start of the GPI to the latest available data. At the country level the correlation is not statistically significant, and the chart shows that more countries increased military expenditure but reduced troop sizes compared to the number that increased both.

The Shift Towards High-tech Warfare

The observed decoupling between military expansion and personnel recruitment can be at least partially attributed to the remarkable strides in defence spending efficiency. With the advent of modern technology and its integration into military operations, armed forces worldwide have witnessed a substantial increase in their capabilities. Advanced weaponry, sophisticated communication systems, and unmanned drones have significantly reduced the need for a larger workforce on the battlefield. As a result, more developed nations have been able to allocate more resources to research, development, and the procurement of cutting-edge military assets. This shift in focus from a large personnel-driven force to a technologically driven one has led to a strategic realignment, enabling militaries to maintain or even enhance their defensive capabilities while streamlining recruitment efforts.

Brazil's allocation of approximately 78 per cent of its defence budget towards personnel expenses, in contrast to Western countries spending less than 50 per cent for the same purpose, serves as a striking example of this disparity. More economically developed nations have been harnessing their technological advancements for military purposes, investing heavily in research and acquisition of state-of-the-art equipment. These developments have allowed them to optimise military operations, reducing the reliance on sheer manpower and simultaneously ensuring higher efficiency and cost-effectiveness. The shift towards technology-driven warfare is also evident in the increasing prevalence of cyber warfare and intelligencebased operations, further exemplifying the changing nature of modern military strategy.

Moreover, the integration of better machinery and automation into military operations has led to enhanced precision, and increased strategic flexibility. Drones and other unmanned vehicles, for instance, can undertake reconnaissance and surveillance missions without putting human lives at risk, while precision-guided munitions can more accurately target specific enemy assets, thereby minimising collateral damage. According to one study, adjusted for quality improvements, US official data indicates that the price of missiles has dropped by approximately 30 per cent since the late 1970s, with the cost of military aircraft remaining relatively flat over the same period.

These advancements not only make the military more efficient but also improve its ability to respond rapidly to emerging threats. In conclusion, the observed decoupling between military expansion and personnel recruitment can be primarily attributed to the increased efficiency of defence spending through advancements in technology and better machinery, enabling modern armies to operate more effectively and maintain robust defensive capabilities.

FIGURE 2.4

Indexed change in military and intelligence satellite fleet, 2014–2022

China has had the largest relative increase in its military and intelligence gathering satellite fleet.



Source: IISS Military Balance, IEP Calculations

In the realm of the most advanced weapon categories, such as fixed-wing aircraft, aircraft carriers, and nuclear submarines, the United States continues to maintain its supremacy in terms of both quality and quantity. However, many Asian countries are making rapid progress, particularly with the emergence of China who is quickly narrowing the gap with the US.

China, being a dominant player in the East Asian region, holds a notably high share in the global stockpile across several critical weapon categories, most notably *Amphibious Vessels*, *Satellites, Submarines, Coastal Defence*, and *Principal Surface Combatants*.

Military Satellites

One area that can serve as a proxy for measuring military sophistication is the growth in the number of military satellites. These satellites play a vital role in various military and intelligence operations, providing capabilities such as communication, reconnaissance, surveillance, and navigation.

When examining the growth of military and intelligence satellite fleets, China's growth over the past two decades has been the largest, closely followed France. China has expanded its military satellite capabilities, highlighting its commitment to advancing its space-based assets for national defence purposes, as shown in figure 2.4. As China continues to make strides in this area, the balance of power within the realm of military satellites is undoubtedly undergoing significant shifts.

Nuclear Weapons

Over the past 15 years, there has been a noticeable trend of nuclear stockpile reduction among all five permanent members of the UN security council, with the exception of China. The nuclear arsenals of Russia and the US, in particular, have undergone significant reductions during this period. This concerted effort towards disarmament reflects global initiatives aimed at reducing or keeping in check the overall nuclear threat and promoting arms control.

Russia and the US, as the two largest nuclear powers, had been actively engaged in bilateral disarmament agreements and arms control treaties prior to 2010. These efforts have led to substantial reductions in their respective nuclear arsenals, as both nations recognise the importance of maintaining strategic stability while gradually scaling back their nuclear capabilities.

In contrast, China stands out as the sole country with a substantial increase in its nuclear arsenal. China has been expanding its nuclear stockpile in recent years, with plans to further increase it to approximately 1,500 nuclear warheads by the mid-2030s. This growth signifies China's determination to strengthen its nuclear capabilities and assert its position as a significant nuclear power. However, although its nuclear arsenal is building rapidly, it remains considerably smaller compared to the stockpiles of Russia and the US.

UAVs

Another area that showcases the use of more sophisticated military technology is the growth of the unarmed aerial vehicles (UAVs, commonly known as drones) export market, which has increased at an annual compound growth rate of 11 per cent in the last decade. This indicates an increasing reliance on unmanned systems for reconnaissance, surveillance, and combat purposes, showcasing a shift towards more sophisticated and autonomous military capabilities. The trend may also imply a potential shift in traditional military strategies towards remote warfare and asymmetric warfare, with UAVs playing a pivotal role in future military operations and security strategies worldwide.

FIGURE 2.5

Global arms exports, selected weapons categories, 1990–2020

Exports of UAV and loitering munitions nearly tripled from 1990 to 2020.



Source: IISS Military Balance, IEP Calculations

TRENDS IN MILITARY CAPABILITY

IEP has developed a methodology to assess military capability which adjusts for the technological differences of different generations and classes of military assets. This approach substantially changes the calculations of the ranking of the military capabilities of the major military counties.

When assessing military strength, the conventional focus tends to be on the quantity of military platforms, such as fighter jets and frigates. However, this approach overlooks the quality and capability of military assets. Not all fighter jets are equal in terms of technological advancements. For example, a modern F-35 aircraft has stealth capabilities, highly advanced radar technology, and superior data sharing and data processing power compared to older fourth generation fighter jets, such as the Su-27 or F-16. This same principle applies for other military assets as well. Therefore, it becomes crucial to consider the disparities in technologies and the overall quality of military assets when evaluating a country's military capability. IEP has taken into account both the quality and quantity of military platforms to calculate the capabilities of the major military nations.

The current version of the military capabilities dataset applies IEP's new methodology to four weapons categories: Fixed wing aircraft, rotary wing aircraft, navel assets, and armoured vehicles.

Overall Capability

In the fixed-wing aircraft category, a point system was implemented for fighter jets and bombers based on their generation and technological capacity. For instance, a fifthgeneration fighter jet is assigned a score of 50, while a 4.5-generation counterpart receives a score of 25. Other types of fixed-wing aircraft are assessed using a simpler scoring system.

The points system also takes into account the battlefield experience and combat readiness of air forces. Battlefield experience measures an air force's recent involvement in combat, while combat readiness assesses its ability to maintain operational readiness over an extended period.

For naval capability, IEP implemented a scoring system for various key classes of naval assets, including nuclear submarines, aircraft carriers, cruisers, destroyers, and amphibious assault ships. For example, an aircraft carrier receives the highest score of 2,000, followed by a nuclear submarine with a score of 1,500.

Different types of assets within one class are also scored based on their technological capacity and lethality. For example, for aircraft carriers, characteristics such as battlefield experience, aircraft capacity, aircraft launch and recovery systems and flight deck size, and configuration are used to gauge the difference between different kinds of carriers. Based on these criteria, a Gerald Ford-class aircraft carrier, the largest and most advanced of its kind, is given a perfect score of five out of five.

The final two categories in the new scoring methodology are rotary wing assets and armoured vehicles. As there are many different classes and categories for both of these asset types, a more simplified scoring system is used compared to fixed wing and naval assets.

The total military capability of a country is calculated by summing the capability score across the four categories, with data available from 2014 to 2022.

Figure 2.6 shows that between 2014 and 2022, global military capability increased by almost 10 per cent. This contrasts with the declining trends in military personnel and the reduction in military expenditure as a percentage of GDP, discussed in previous sections. Essentially, it suggests that despite the reduction in the size of armed forces and the relative level of military spending, armed forces have become more capable, as weapon systems have become more technologically advanced and lethal.

FIGURE 2.6

Global military capability, 2014-2022

Global military capability has risen by almost 10 per cent since 2014.



Source: IISS Military Balance, IEP Calculations

The trend in overall capability for the top six military powers is shown in figure 2.7. Of these six countries, China has experienced the most significant increase in its overall military capability since 2014. Conversely, France and Russia have witnessed a contraction in their overall military capability over the same period. Table 2.1 presents the top 10 countries by overall military capability in 2022. The United States has the highest overall score, and the highest score on all four categories individually. China's rise in military capability over the past decade now means it is ranked second overall.

TABLE 2.1

Top ten countries by overall military capability, 2022

Rank	Country	Overall Military Capability Score
1	United States	1.00
2	China	0.91
3	Russia	0.90
4	France	0.81
5	United Kingdom	0.81
6	India	0.80
7	Japan	0.79
8	South Korea	0.78
9	Italy	0.75
10	Taiwan	0.75

FIGURE 2.7

Military capability trend in the top six military powers, 2014-2022

China's overall military capability has increased significantly since 2014.



Source: IISS Military Balance, IEP Calculations

Fixed-Wing Aircraft

The trends in fixed-wing capability and total quantity globally since 2014 are shown in Figure 2.8. There has been a significant upswing in fixed-wing capability worldwide over the past decade. This increase is the result of the retirement of older or outdated fixed-wing platforms that have been replaced by more modern, capable, and lethal assets in numerous countries.

FIGURE 2.8

Global fixed-wing capability, 2014–2022

While the quantity of fixed-wing aircraft declined globally since 2014, overall capability increased by 16 per cent.



Source: IISS Military Balance, IEP Calculations

Naval Capability

Both scoring systems are then combined and utilised to estimate the naval capability of countries. Table 2.2 highlights the top 10 countries in 2022 based on naval capability.

The United States has a much higher level of naval capability than any other country, with Russia having the second highest level. Although the size of China's fleet is almost as large as the US, the quality of its fleet means that it is in third place.

The key factor explaining Russia's higher naval capacity than China is its significantly larger fleet of ballistic missile nuclear submarines. China's navy boasts a large fleet of frigates and corvettes, however these are awarded fewer points than other naval assets such as aircraft carriers, nuclear submarines, cruisers, amphibious assault ships, and destroyers.

TABLE 2.2

Top ten countries by overall naval capability, 2022

Rank	Country	Naval Capability Score	Naval Fleet Size
1	United States	1.00	224
2	Russia	0.90	126
3	China	0.90	212
4	United Kingdom	0.83	35
5	France	0.83	40
6	Japan	0.79	76
7	India	0.77	51
8	South Korea	0.75	60
9	Italy	0.73	26
10	Taiwan	0.71	36

Appendix



Appendix A: country changes in military expenditure and armed forces, 2008–2023

	2008		2023	2023 Change		e
Country	Armed Forces Rate	Milex (% GDP)	Armed Forces Rate	Milex (% GDP)	Armed Forces Rate	Milex (% GDP)
Afghanistan	161.2	31.3	243.1	10	82	-21.3
Albania	347.6	2	263.9	1.6	-83.8	-0.4
Algeria	430.5	2.7	309.6	4.8	-120.9	2.1
Angola	661.8	2.5	300.7	1.4	-361.1	-1.1
Argentina	189.5	0.9	158.4	0.5	-31.1	-0.3
Armenia	1521	3.5	1542.9	4.2	21.9	0.7
Australia	256.6	1.9	228.4	2	-28.2	0
Austria	483.4	0.7	260.6	0.8	-222.7	0.1
Azerbaijan	788.2	3.2	649.3	3.8	-138.9	0.5
Bahrain	1305.2	2.8	557	3.2	-748.3	0.4
Bangladesh	92.5	0.8	95.2	0.9	2.7	0.2
Belarus	750.9	1	502.9	1	-248	0
Belgium	377.5	1	199	1	-178.5	0
Benin	56.5	0.7	54.3	2.2	-2.2	1.6
Bhutan	66.5	1.9	138.8	2	72.3	0.1
Bolivia	426.3	1.2	430.7	1.1	4.4	-0.1
Bosnia and Herzegovina	268.6	1.3	287.3	0.7	18.7	-0.6
Botswana	499.2	2.7	342.2	2.8	-157	0
Brazil	176.4	1.4	170.2	1.2	-6.2	-0.2
Bulgaria	599.4	1.5	544.8	1.6	-54.6	0
Burkina Faso	75.2	1.2	49.4	2.6	-25.8	1.4
Burundi	227.8	2.8	233.1	1.8	5.3	-0.9
Cambodia	878.3	2.5	741.3	3.5	-137	1.1
Cameroon	109.3	1.3	91	1	-18.3	-0.3
Canada	194.2	1.2	172.9	1.1	-21.2	-0.1
Central African Republic	78	2.1	164	1.6	86	-0.5
Chad	242.1	1.4	187.6	2	-54.5	0.6
Chile	437.4	1.5	349.4	1.2	-88	-0.3
China	166.3	1.3	172.8	1.2	6.5	-0.1
Colombia	501.7	2.5	493.4	1.8	-8.3	-0.7
Costa Rica	0	0.5	0	0.6	0	0.1
Cote d' Ivoire	91.9	1.5	77	0.9	-14.9	-0.6
Croatia	424.5	1.6	414.4	1.8	-10.2	0.3
Cuba	435.8	4	437	2.9	1.2	-1.1
Cyprus	1294.6	1.9	958.9	1.9	-335.7	-0.1
Czech Republic	220.3	1.3	227.7	1.3	7.4	-0.1
Democratic Republic of the Congo	233.7	0.9	135.6	0.6	-98.1	-0.3
Denmark	470.1	1.3	261.8	1.3	-208.3	0.1
Djibouti	1124.9	4.1	932.3	0.8	-192.5	-3.3
Dominican Republic	411.9	0.6	499.2	0.7	87.2	0.1
Ecuador	390.7	2	229.2	1.4	-161.6	-0.6
Egypt	632.6	1.9	395.1	1.1	-237.5	-0.8
El Salvador	232.1	0.6	386.7	0.8	154.5	0.2

Appendix

	2008		2023	023 Change		2023 Change		e
Country	Armed Forces Rate	Milex (% GDP)	Armed Forces Rate	Milex (% GDP)	Armed Forces Rate	Milex (% GDP)		
Equatorial Guinea	232	1.5	86.6	1.3	-145.4	-0.2		
Eritrea	3754.6	2.6	5476.3	2.3	1721.7	-0.3		
Estonia	338.4	1.9	535.4	2.1	197	0.2		
Eswatini	249.4	1.8	245.9	1.7	-3.5	-0.1		
Ethiopia	203.3	1.4	111.8	1.4	-91.5	0		
Finland	548.3	1.3	347.4	2.1	-200.9	0.8		
France	419.6	2	314.7	2	-104.8	-0.1		
Gabon	360.4	1	196.7	1.3	-163.7	0.2		
Georgia	477.3	7.9	551.5	1.3	74.2	-6.6		
Germany	321.7	1.2	219.7	1.3	-102	0.2		
Ghana	45.1	0.3	46.3	0.3	1.2	0		
Greece	1459.9	2.9	1384.7	3.5	-75.2	0.7		
Guatemala	174.6	0.4	101.2	0.4	-73.4	0		
Guinea	117.4	0.8	70	1.7	-47.4	0.9		
Guinea-Bissau	242.4	1.9	211.3	1.6	-31.1	-0.3		
Guyana	135.1	1.2	420.4	0.6	285.3	-0.7		
Haiti	0.7	0.1	6	0.1	5.4	0		
Honduras	169.4	0.7	143.3	1.2	-26.1	0.5		
Hungary	321.7	1.3	322.6	1.6	0.8	0.3		
Iceland	0	0.2	0	0.2	0	-0.1		
India	120.1	2.2	103.3	1.9	-16.8	-0.3		
Indonesia	127.5	0.6	143.6	0.7	16	0.1		
Iran	780.3	2.2	676.9	2.2	-103.4	0		
Iraq	1261.7	3.9	433.7	3.1	-828	-0.8		
Ireland	243.5	0.5	163.2	0.2	-80.3	-0.2		
Israel	5217.6	6.4	1875.4	3.7	-3342.3	-2.7		
Italy	324.4	1.4	274.7	1.6	-49.7	0.1		
Jamaica	109.3	0.7	210.4	1.3	101.1	0.6		
Japan	196.3	0.9	199.4	1.1	3.1	0.2		
Jordan	1750.4	5.5	890.5	4	-859.9	-1.5		
Kazakhstan	376	1	201.1	0.8	-174.9	-0.2		
Kenya	68	1.7	44.6	1.2	-23.4	-0.5		
Kosovo	0	0	0	0.9	0	0.9		
Kuwait	511	2.9	409.9	5	-101	2.1		
Kyrgyz Republic	199.8	1.7	164.4	1.2	-35.4	-0.4		
Laos	505.2	0.3	427.6	0.2	-77.6	-0.1		
Latvia	232.5	1.5	340.4	2.1	107.9	0.6		
Lebanon	1695.2	2.6	1092.9	3	-602.3	0.5		
Lesotho	92.1	2.5	86.7	1.6	-5.4	-0.9		
Liberia	50.5	0.2	39.6	0.5	-10.9	0.3		
Libya	1278.7	0.9	114.8	2.8	-1163.9	1.9		
Lithuania	407.9	1.1	836.3	2.3	428.5	1.2		
Madagascar	72.8	1	45.6	0.7	-27.3	-0.3		
Malawi	38.9	0.6	52.4	0.7	13.5	0.1		
Malaysia	415.1	1.8	333	1	-82.1	-0.9		
Mali	54.4	1.6	92.9	4.5	38.6	2.9		
Mauritania	517.2	2.4	334.7	2.3	-182.5	-0.2		
Mauritius	0	1.2	0	2	0	0.8		
Mexico	206.5	0.3	169.4	0.4	-37.1	0.1		
Moldova	202.9	0.4	139.3	0.3	-63.6	0		
Mongolia	336.7	0.9	285.4	0.6	-51.3	-0.4		

	2008	2008 2023 Ch		Chang	nge	
Country	Armed Forces Rate	Milex (% GDP)	Armed Forces Rate	Milex (% GDP)	Armed Forces Rate	Milex (% GDP)
Montenegro	806.5	1.6	374.8	1.6	-431.7	0.1
Могоссо	636.6	4.3	522.7	4.5	-113.9	0.2
Mozambique	54.5	0.7	34	0.8	-20.5	0.1
Myanmar	791.7	5.4	657.1	3.2	-134.6	-2.3
Namibia	446.1	3.4	385.7	2.9	-60.4	-0.5
Nepal	244.7	1.2	316.2	1.1	71.5	-0.1
Netherlands	301.2	1.3	191.3	1.5	-109.9	0.2
New Zealand	218.2	1.3	180.3	1.4	-37.9	0.1
Nicaragua	239.4	0.5	172.7	0.5	-66.7	0.1
Niger	30.3	0.7	20.2	1.7	-10.1	0.9
Nigeria	56	0.4	65.4	0.6	9.4	0.2
North Korea	4918.3	8	4837.4	24	-80.9	16
North Macedonia	535.2	1.9	386.7	1.6	-148.6	-0.3
Norway	452.5	1.2	467.4	1.5	14.9	0.3
Oman	1657.5	5.3	930.9	5.9	-726.6	0.6
Pakistan	390.2	2.5	276.4	2.6	-113.8	0.1
Panama	0	0.9	0	1.2	0	0.3
Papua New Guinea	51.3	0.3	39.4	0.3	-11.9	0
Paraguay	169.7	0.5	205.7	0.7	36	0.1
Peru	344.1	1.2	237.9	0.7	-106.2	-0.4
Philippines	119.6	1.3	125.7	1.4	6.2	0.1
Poland	352.9	1.8	286.1	1.9	-66.7	0.1
Portugal	417.3	1.2	260	1	-157.3	-0.2
Qatar	1446.3	2.1	612.2	3.8	-834	1.7
Republic of the Congo	271	2.2	224.8	1.8	-46.2	-0.4
Romania	395.9	1.4	363.7	1.7	-32.2	0.3
Russia	719.7	2.4	593	2.4	-126.7	0
Rwanda	348.8	1.4	239.5	1.4	-109.3	0
Saudi Arabia	878.5	4.9	705.9	4.5	-172.6	-0.4
Senegal	116.5	1.3	78.5	1.5	-37.9	0.3
Serbia	601	2	389.8	2	-211.2	0
Sierra Leone	193	0.5	98.8	0.6	-94.2	0.2
Singapore	1649	3.9	853.5	2.8	-795.5	-1.1
Slovakia	340.7	1.7	318.1	1.8	-22.7	0.1
Slovenia	323.8	1.4	301.9	1.4	-21.8	0
Somalia	23	4	79	1.6	56	-2.4
South Africa	131.6	1.1	123.6	0.8	-8	-0.3
South Korea	1416.4	2.3	1303	2.5	-113.4	0.2
Spain	333.6	1.2	261.2	1.1	-72.4	-0.1
Sri Lanka	660.4	3.2	1168	1.6	507.6	-1.6
Sudan	289.8	5.3	222.5	1	-67.3	-4.3
Sweden	286.4	1.3	140.8	1.3	-145.6	0.1
Switzerland	177.3	0.7	223.7	0.7	46.4	-0.1
Syria	1563.2	3.7	884.7	3.2	-678.5	-0.4
Taiwan	1282.6	2.6	1240.9	2	-41.7	-0.7
Tajikistan	114.2	1	88.4	1.1	-25.8	0.1
Tanzania	69.8	0.7	54.8	1.2	-14.9	0.6
Thailand	466.6	1.5	503.3	1.2	36.7	-0.3
The Gambia	58.5	0.8	151.5	0.7	93	-0.1
Timor-Leste	84.1	3.6	164	1.8	79.9	-1.8
Тодо	143.2	1.3	96.6	2.1	-46.6	0.8

Appendix

	2008		2023		Change	
Country	Armed Forces Rate	Milex (% GDP)	Armed Forces Rate	Milex (% GDP)	Armed Forces Rate	Milex (% GDP)
Trinidad and Tobago	216	2.5	303.7	2.9	87.7	0.4
Tunisia	348.4	1.1	289.7	2.8	-58.7	1.6
Türkiye	695.1	1.8	677.9	0.7	-17.2	-1.1
Turkmenistan	330.3	0.6	567.6	1.3	237.3	0.7
Uganda	153.3	1.1	95.2	2.3	-58.1	1.2
Ukraine	340.9	1	1376.8	2.2	1035.9	1.2
United Arab Emirates	1067.3	2.8	667.3	4	-400	1.2
United Kingdom	329.8	2.6	222.7	2.2	-107	-0.4
United States	511	4.7	471.6	3.1	-39.4	-1.7
Uruguay	746.2	1.1	616.5	0.8	-129.7	-0.3
Uzbekistan	231	2.9	138.6	1.9	-92.4	-0.9
Venezuela	368.7	1.9	384	0.2	15.3	-1.7
Vietnam	539.7	2.3	537.8	1.5	-1.9	-0.9
Yemen	298.6	5.5	273	4.4	-25.6	-1.2
Zambia	128.8	1.5	75.4	1.6	-53.4	0.2
Zimbabwe	221.2	1.5	177.7	2	-43.5	0.5

Our research analyses peace and its economic value.



We develop global and national indices, calculate the economic impact of violence, analyse country level risk and have developed an empirical framework for Positive Peace that provides a roadmap to overcome adversity and conflict, helping to build and sustain lasting peace.

Download our latest reports and research briefs for free at: visionofhumanity.org/resources





FOR MORE INFORMATION INFO@ECONOMICSANDPEACE.ORG EXPLORE OUR WORK WWW.ECONOMICSANDPEACE.ORG AND WWW.VISIONOFHUMANITY.ORG



GlobalPeaceIndex



IEP is an independent, non-partisan, non-profit think tank dedicated to shifting the world's focus to peace as a positive, achievable, and tangible measure of human wellbeing and progress.

IEP is headquartered in Sydney, with offices in New York, Brussels, The Hague, Mexico City and Nairobi. It works with a wide range of partners internationally and collaborates with intergovernmental organisations on measuring and communicating the economic value of peace.

The Institute for Economics & Peace is a registered charitable research institute in Australia as a Deductible Gift Recipient. IEP USA is a 501(c)(3) tax exempt organization.

JULY 2024 / IEP REPORT 98

