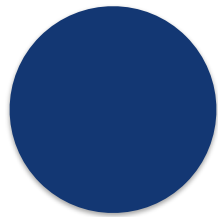


Política Internacional e Geopolítica a era da imprevisibilidade

**INSTITUTO CULTURAL
D. ANTÓNIO FERREIRA GOMES
José Pedro Teixeira Fernandes
SESSÃO Nº 34**

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PARTE I – TEMA PRINCIPAL

O Ocidente está a perder a vantagem tecnológica-militar? (1) [FONTE: The Economist, 3/07/2023]

Special report | Lessons from Ukraine

The war in Ukraine shows how technology is changing the battlefield

But mass still counts, argues Shashank Joshi in the first of seven chapters of a special report on the future of warfare



IMAGE: GETTY IMAGES

O Ocidente está a perder a vantagem tecnológica-militar? (2)

[FONTE: Richard Norton-Taylor / Guardian, 9/02/2016]

West's military advantage is being eroded, report warns

[Richard Norton-Taylor](#)



RQ-4 Block 10 Global Hawk unmanned drones at an undisclosed location. The number of countries known to operate UAVs has doubled over the past five years. Photograph: Northrop Grumman/EPA

The west's decades-long advantage in military technology is being eroded as defence spending in the rest of the world, notably Asia, soars, an authoritative report says.

O Ocidente está a perder a vantagem tecnológica-militar? (3)

[FONTE: Richard Norton-Taylor / Guardian, 9/02/2016]

The latest annual Military Balance by the [International Institute for Strategic Studies \(IISS\)](#) shows that advances in weapons-related technology once the preserve of the west – including cruise missiles, unmanned drones and electronic warfare – are becoming increasingly accessible to more and more countries.

The number of countries known to operate UAVs (unmanned aerial vehicles) has doubled over the past five years, and China has exported them to Iraq and Nigeria.

“Western military technological superiority, a core assumption of the past two decades, is eroding”, John Chipman, IISS director general, told a London press conference. “Slowing this emerging trend or reversing it will be a key preoccupation of western strategists in the coming decade.”

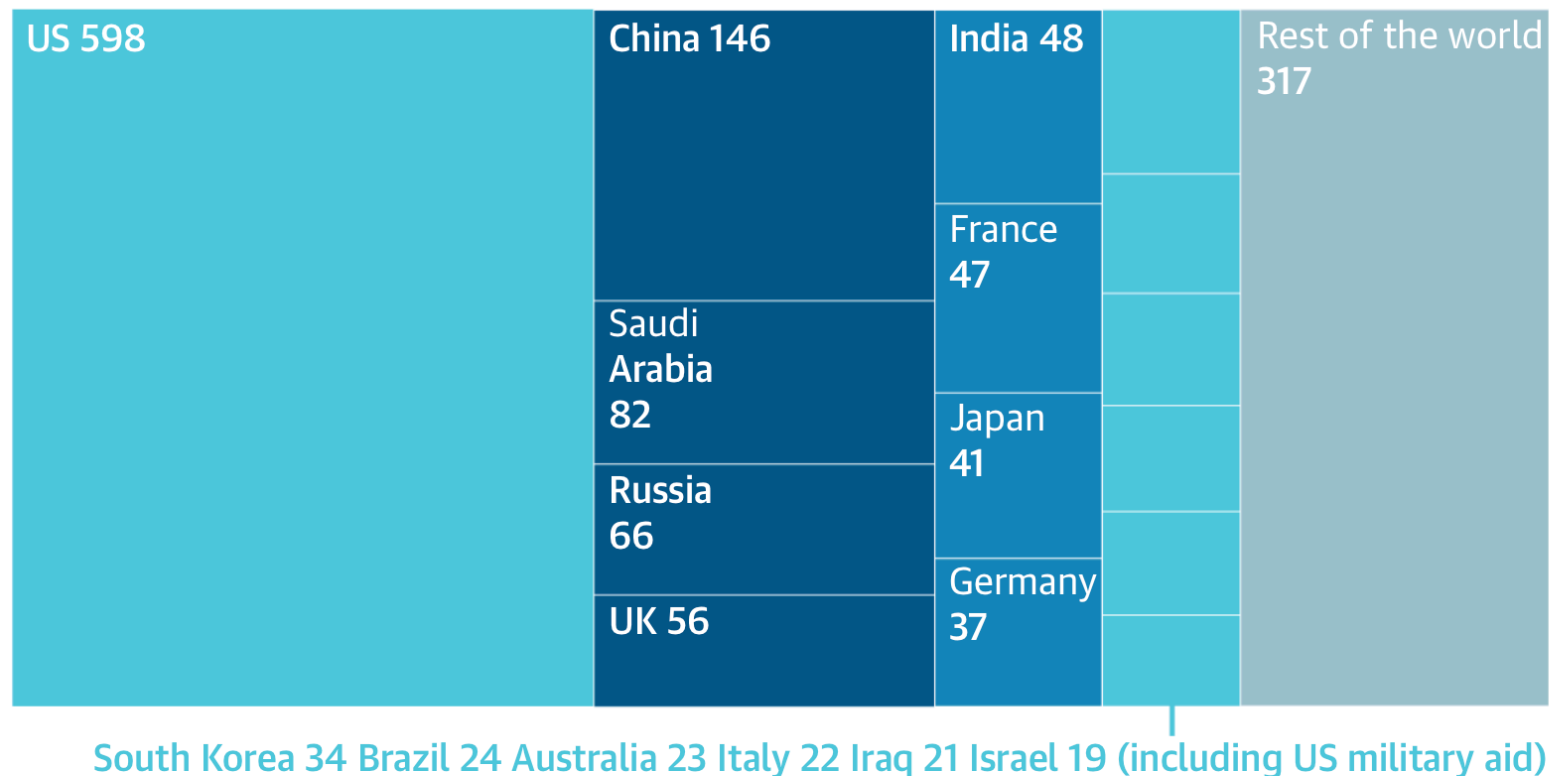
Britain is trying to stay ahead of the curve by developing the Zephyr high-altitude [“pseudo-satellite”](#), a solar-powered surveillance drone operating at the edge of space, while the US is developing “swarming UAVs” combining cheap structures with sophisticated electronics, the survey notes.

O Ocidente está a perder a vantagem tecnológica-militar? (4)

[FONTE: Richard Norton-Taylor / Guardian, 9/02/2016]

The top 15 defence budgets

US\$bn



Guardian graphic

Source: IISS

O Ocidente está a perder a vantagem tecnológica-militar? (5)

[FONTE: Richard Norton-Taylor / Guardian, 9/02/2016]

According to the survey:

- The rise in Russia's defence budget last year accounted for about 20% of the total worldwide increase in military spending, though it followed years of neglect and was from a relatively low base.
- Asia now spends nearly \$100bn (£69bn) more on defence than Nato's European members.
- The number of army battalions in the biggest Nato countries and in US forces in Europe has fallen from 649 to 185 over the past 15 years.
- Since 1991, the number of British combat aircraft has fallen from 475 to 194, and the number of French warplanes from 579 to 271.

It calls for better cooperation between Nato and the EU. "For many of the issues that preoccupy Nato's East – such as hybrid threats from Russia – the EU possesses many of the capabilities that Nato does not, including a wide range of development, security and justice tools," it says.

O Ocidente está a perder a vantagem tecnológica-militar? (6) [FONTE: Peter Apps / Reuters, 6/07/2018]

Column: Western armies are losing their high-tech edge

(Reuters) - When America goes to war, its soldiers, sailors and pilots typically have long been used to having a spectacular technological edge. Those days are ending fast.

From the South China Sea to Eastern Europe – and even the Korean Peninsula – U.S. commanders are now considering the prospect of war against enemies who may be capable of deploying overwhelming firepower and sophisticated new technology. Confrontations with Russia and China in particular are escalating far faster than predicted – with the realistic prospect either nation could outgun U.S. forces in their immediate neighborhood in the early stages of any conflict.

The Pentagon is increasingly worried about rapid proliferation of Chinese and Russian anti-ship and anti-aircraft missile systems, putting U.S. military planners in an unfamiliar position. The last time U.S. forces went to war without an overwhelming advantage was against Nazi German troops in North Africa in 1943.

O Ocidente está a perder a vantagem tecnológica-militar? (7) [FONTE: Peter Apps / Reuters, 6/07/2018]

Technologies that until recently were only found in the hands of the United States and its closest allies are now much more widespread. At the time of its 2008 war with Georgia, Russia lacked any significant military unmanned drone program, but now uses them routinely in both Syria and Ukraine. Using suspected hacked and stolen plans, China has built its own stealth fighters as well as its own bespoke new systems such as ballistic missiles specifically designed to target U.S. aircraft carriers.

It's difficult to say how well that weaponry would function against the U.S. military in any war. What is clearer, however, is that the United States faces a specific problem in most of its confrontations. While the U.S. military remains more powerful than any other, it is spread across the globe. Its enemies, meanwhile – whether Russia, China or smaller states like Iran and North Korea – have dedicated almost all their forces to fighting in their own backyards. If war should come, that would put nearby U.S. and allied forces at a significant disadvantage, quite possibly outgunned entirely.

O Ocidente está a perder a vantagem tecnológica-militar? (8) [FONTE: Peter Apps / Reuters, 6/07/2018]

Upcoming breakthroughs may make that even worse. Increasingly, military experts talk of an arms race between major nations on artificial intelligence that could be as crucial to this century as the race for atomic weapons during World War Two. Some U.S. officials openly worry Washington may be falling behind in this contest, particularly with some major Silicon Valley firms such as Google reluctant to work with the Pentagon on military contracts.

Speaking at a major military conference in London earlier this month, one senior officer said that the first nation to deploy an electromagnetic pulse weapon on the battlefield to disable enemy systems would reshape the face of warfare. Once again, it is far from obvious that is a race the United States will win.

O Ocidente está a perder a vantagem tecnológica-militar? (9) [FONTE: Peter Apps / Reuters, 6/07/2018]

Most major nations, such as Britain, believe recent investment in major weapons platforms such as aircraft carriers and F-35 jets should still give them the edge. Even there, though, experts worry whether the next generation of technology – such as robotic vehicles – will prove functional in a major conflict where a sophisticated enemy might be able to shut them down. More seriously, Western analysts worry critical national infrastructure may already have been penetrated by cyber attackers who could turn off essential systems on the first day of any conflict.

That sheer level of uncertainty may itself make conflict more likely, with nations more likely to strike first to gain a tactical advantage while struggling to realistically assess what their enemies can and wish to do. The United States and its potential foes can ill afford to ignore these accelerating trends, and unless they can find some common ground to at least discuss them the consequences could be disastrous.

O Ocidente está a perder a vantagem tecnológica-militar? (10)

[FONTE: ASPI - Australian Strategic Policy Institute, 28/08/2024]



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ASPI's two-decade Critical Technology Tracker: The rewards of long-term research investment

28 August 2024

O Ocidente está a perder a vantagem tecnológica-militar? (11)

[FONTE: ASPI - Australian Strategic Policy Institute, 28/08/2024]

Executive Summary

This report accompanies a major update of ASPI's Critical Technology Tracker website,¹ which reveals the countries and institutions—universities, national labs, companies and government agencies—leading scientific and research innovation in critical technologies. It does that by focusing on high-impact research—the top 10% of the most highly cited papers—as a leading indicator of a country's research performance, strategic intent and potential future science and technology (S&T) capability.

Now covering 64 critical technologies and crucial fields spanning defence, space, energy, the environment, artificial intelligence (AI), biotechnology, robotics, cyber, computing, advanced materials and key quantum technology areas, the *Tech Tracker's* dataset has been expanded and updated from five years of data (previously, 2018–2022)² to 21 years of data (2003–2023).³

O Ocidente está a perder a vantagem tecnológica-militar? (12)

[FONTE: ASPI - Australian Strategic Policy Institute, 28/08/2024]

These new results reveal the stunning shift in research leadership over the past two decades towards large economies in the Indo-Pacific, led by China's exceptional gains. The US led in 60 of 64 technologies in the five years from 2003 to 2007, but in the most recent five years (2019–2023) is leading in seven. China led in just three of 64 technologies in 2003–2007⁴ but is now the lead country in 57 of 64 technologies in 2019–2023, increasing its lead from our rankings last year (2018–2022), where it was leading in 52 technologies.

India is also emerging as a key centre of global research innovation and excellence, establishing its position as an S&T power. That said, the US, the UK and a range of countries from Europe, Northeast Asia and the Middle East have maintained hard-won strengths in high-impact research in some key technology areas, despite the accelerated efforts of emerging S&T powers.

O Ocidente está a perder a vantagem tecnológica-militar? (13)

[FONTE: ASPI - Australian Strategic Policy Institute, 28/08/2024]

The historical data provides a new layer of depth and context, revealing the performance trajectory different countries have taken, where the momentum lies and also where longer term dominance over the full two decades might reflect foundational expertise and capabilities that carry forward even when that leader has been edged out more recently by other countries. The results also help to shed light on the countries, and many of the institutions, from which we're likely to see future innovations and breakthroughs emerge.

China's new gains have occurred in *quantum sensors, high-performance computing, gravitational sensors, space launch and advanced integrated circuit design and fabrication* (semiconductor chip making). The US leads in *quantum computing, vaccines and medical countermeasures, nuclear medicine and radiotherapy, small satellites, atomic clocks, genetic engineering and natural language processing*.

India now ranks in the top 5 countries for 45 of 64 technologies (an increase from 37 last year) and has displaced the US as the second-ranked country in two new technologies (*biological manufacturing and distributed ledgers*) to rank second in seven of 64 technologies. Another notable change involves the UK, which has dropped out of the top 5 country rankings in eight technologies, declining from 44 last year to 36 now.

O Ocidente está a perder a vantagem tecnológica-militar? (14)

[FONTE: ASPI - Australian Strategic Policy Institute, 28/08/2024]

Top 5 countries visual snapshot (2019–2023)

Below is a visual snapshot showing the top 5 countries ranked by their proportion (%) of high-impact research outputs across 64 technologies over the five years from 2019 to 2023. On the left-hand side is a column headed *Technology monopoly risk* that highlights concentrations of scientific and technological research expertise in a single country. A high *technology monopoly risk* is a potential indicator for future breakthroughs in technology capability. This metric is a combination of two factors:

1. the lead country's share of world's top 10 institutions
2. the lead country's lead over its closest competitor (ratio of top 10% publications).

The **Technology monopoly risk** traffic-light rating:

- **High** = 8+/10 top institutions in lead country and at least three times (3×) research lead
- **Medium** = 5+/10 top institutions in lead country and at least 2× research lead
- **Low** = medium criteria not met.

Lead country's share of world's top 10 institutions—in this example, China has 9 out the top 10 institutions




































Advanced optical communication						
		China	US	UK	India	Saudi Arabia
		41.0%	11.4%	5.2%	4.0%	3.4%

Ratio of 1st- and 2nd-ranked country's number of top 10% highly cited publications—in this example 41.0/11.4

O Ocidente está a perder a vantagem tecnológica-militar? (15)

[FONTE: ASPI - Australian Strategic Policy Institute, 28/08/2024]

Advanced information and communication technologies

Technology	Tech monopoly risk	Top 5 countries				
Advanced optical communication	9/10 3.6	 41.0%	 11.4%	 5.2%	 4.0%	 3.4%
Advanced undersea wireless communication	9/10 6.1	 51.5%	 8.5%	 7.7%	 5.7%	 3.5%
Advanced radiofrequency communication	6/10 3.3	 31.9%	 9.6%	 5.6%	 5.2%	 4.6%
Distributed ledgers	7/10 2.9	 29.4%	 10.0%	 9.5%	 5.7%	 4.7%
High-performance computing	6/10 1.3	 30.6%	 23.7%	 8.1%	 4.1%	 4.0%
Mesh and infrastructure-independent networks	6/10 1.8	 29.2%	 16.3%	 7.3%	 3.9%	 3.1%
Protective cybersecurity technologies	4/10 1.6	 22.1%	 13.7%	 7.9%	 5.9%	 5.0%

O Ocidente está a perder a vantagem tecnológica-militar? (16)

[FONTE: ASPI - Australian Strategic Policy Institute, 28/08/2024]































Advanced materials and manufacturing

Technology	Tech monopoly risk	Top 5 countries					
Advanced composite materials	9/10 4.1						
		45.4%	11.2 %	6.2%	4.1%	4.0%	
Advanced protection	8/10 3.4						
		43.5%	12.9%	4.8%	4.1%	2.9%	
Coatings	10/10 11.6						
		62.5%	5.4%	5.3%	3.0%	2.8%	
High-specification machining processes	9/10 3.4						
		42.8%	12.6%	10.6%	3.5%	3.0%	
Nanoscale materials and manufacturing	10/10 11.2						
		60.6%	5.4%	5.2%	4.0%	3.6%	
Novel metamaterials	9/10 4.0						
		51.7%	12.8%	4.2%	3.4%	2.7%	
Smart materials	9/10 6.0						
		46.1%	7.7%	6.2%	5.2%	3.3%	
Advanced explosives and energetic materials	6/10 2.9						
		53.0%	18.1%	4.4%	3.6%	3.2%	
Advanced magnets and superconductors	5/10 2.2						
		33.3%	15.0%	7.4%	6.8%	5.2%	
Continuous-flow chemical synthesis	5/10 2.3						
		29.1%	12.8%	5.2%	4.6%	4.1%	
Critical minerals extraction and processing	7/10 3.9						
		42.0%	10.7%	5.1%	2.6%	2.3%	
Wide and ultrawide bandgap semiconductors	6/10 2.4						
		42.6%	17.6%	6.1%	4.9%	4.1%	
Additive manufacturing	6/10 1.4						
		24.6%	18.0%	5.9%	5.0%	4.5%	

O Ocidente está a perder a vantagem tecnológica-militar? (17)

[FONTE: ASPI - Australian Strategic Policy Institute, 28/08/2024]




































Artificial intelligence, computing and communications

Technology	Tech monopoly risk	Top 5 countries				
Advanced data analytics	9/10 2.3	 33.2%	 14.4%	 5.4%	 4.0%	 3.6%
AI algorithms and hardware accelerators	6/10 2.2	 30.9%	 14.0%	 5.9%	 5.0%	 4.5%
Machine learning	9/10 2.4	 36.5%	 15.4%	 5.4%	 3.6%	 3.2%
Advanced integrated circuit design and fabrication	4/10 1.1	 24.4%	 22.5%	 5.6%	 4.3%	 4.2%
Adversarial AI	7/10 1.6	 31.1%	 19.5%	 5.5%	 5.1%	 3.5%
Natural language processing	6/10 1.0	 24.8%	 24.1%	 4.2%	 4.2%	 3.7%

O Ocidente está a perder a vantagem tecnológica-militar? (18)

[FONTE: ASPI - Australian Strategic Policy Institute, 28/08/2024]









































Defence, space, robotics and transportation

Technology	Tech monopoly risk	Top 5 countries				
Advanced aircraft engines	10/10 9.0	 63.1%	 7.0%	 3.6%	 3.0%	 3.0%
Drones, swarming and collaborative robots	8/10 3.7	 38.4%	 10.3%	 5.3%	 4.8%	 4.4%
Hypersonic detection and tracking	10/10 5.5	 72.9%	 13.2%	 3.3%	 1.5%	 1.3%
Advanced robotics	7/10 1.8	 34.5%	 19.7%	 4.7%	 4.2%	 4.0%
Autonomous systems operation technology	7/10 1.9	 34.3%	 18.4%	 4.8%	 4.5%	 3.7%
Small satellites	4/10 1.3	 23.0%	 17.9%	 9.2%	 4.0%	 3.8%
Space launch systems	5/10 1.2	 22.8%	 19.0%	 7.2%	 6.5%	 6.4%

O Ocidente está a perder a vantagem tecnológica-militar? (19)

[FONTE: ASPI - Australian Strategic Policy Institute, 28/08/2024]

Energy and environment

Technology	Tech monopoly risk	Top 5 countries				
Electric batteries	10/10 6.6	 68.3%	 10.4%	 3.7%	 2.4%	 2.3%
Hydrogen and ammonia for power	9/10 11.1	 60.8%	 5.5%	 5.1%	 3.3%	 2.6%
Supercapacitors	9/10 8.1	 62.9%	 7.8%	 6.0%	 3.6%	 1.9%
Directed energy technologies	7/10 2.7	 43.7%	 16.4%	 5.2%	 4.6%	 3.2%
Nuclear waste management and recycling	7/10 3.2	 42.8%	 13.3%	 5.4%	 4.9%	 3.7%
Photovoltaics	7/10 3.4	 31.1%	 9.1%	 7.1%	 4.2%	 3.3%
Biofuels	6/10 1.4	 23.4%	 16.7%	 4.7%	 4.4%	 3.6%
Nuclear energy	5/10 1.7	 31.6%	 18.6%	 5.2%	 5.1%	 4.3%

O Ocidente está a perder a vantagem tecnológica-militar? (20)

[FONTE: ASPI - Australian Strategic Policy Institute, 28/08/2024]

Sensing, timing and navigation

Technology	Tech monopoly risk	Top 5 countries				
Inertial navigation systems	9/10 4.5	 48.5%	 10.9%	 3.9%	 3.7%	 3.6%
Multispectral and hyperspectral imaging sensors	9/10 5.5	 53.7%	 9.8%	 3.7%	 3.5%	 2.7%
Photonic sensors	10/10 4.0	 45.8%	 11.4%	 5.4%	 3.8%	 3.0%
Radar	10/10 3.4	 42.7%	 12.7%	 5.1%	 3.6%	 3.2%
Satellite positioning and navigation	8/10 3.4	 40.9%	 12.2%	 4.5%	 4.2%	 3.5%
Sonar and acoustic sensors	10/10 3.5	 49.5%	 14.3%	 4.3%	 4.1%	 3.2%
Magnetic field sensors	6/10 2.1	 35.2%	 16.6%	 7.7%	 7.0%	 4.6%
Atomic clocks	6/10 1.5	 29.5%	 19.4%	 9.5%	 7.3%	 5.2%
Gravitational-force sensors	5/10 1.0	 20.9%	 20.8%	 7.3%	 6.4%	 5.7%

O Ocidente está a perder a vantagem tecnológica-militar? (21)

[FONTE: ASPI - Australian Strategic Policy Institute, 28/08/2024]

US cuts to science and technology could fast-track China's tech dominance | The Strategist

US cuts to science and technology could fast-track China's tech dominance



Is the United States now trying to lose the technology race with China? It certainly seems to be.

O Ocidente está a perder a vantagem tecnológica-militar? (22)

[FONTE: ASPI - Australian Strategic Policy Institute, 28/08/2024]

China is outpacing the US in the volume of high-impact research in 57 of the 64 critical technologies in [ASPI's Critical Technology Tracker](#). The US's main remaining advantage is downstream in implementing technology, and even that's at risk as China's significant S&T investments pay off.

Now the US's lead may disappear even faster following cuts to the National Institutes of Health (NIH), National Aeronautics and Space Agency (NASA) and National Science Foundation (NSF).

The NIH is the biggest public funder of biomedical research worldwide and impacts global health in ways often taken for granted. For example, it supported the foundational work that led to the [Haemophilus influenzae type b vaccine](#) which, by some estimates, prevented 1.2 million infant deaths between 2000 and 2015. NASA is a stalwart of space research and inadvertently has contributed to medical innovations as it has attended to the health of its astronauts, such as the ear thermometer. The NSF funds all non-medical scientific research (biology, quantum computing, artificial intelligence, space and advanced materials) in the US and manages major research facilities.

O Ocidente está a perder a vantagem tecnológica-militar? (23)

[FONTE: ASPI - Australian Strategic Policy Institute, 28/08/2024]

The Critical Technology Tracker ranks the US first in quantum computing, with seven of the top 10 institutions based in the US. However, quantum technologies are priority areas for China, which unveiled its most [advanced quantum computer](#), a 504-Qubit Superconductor, in December 2024. In 2022, the [NSF's Directorate for Technology, Innovation and Partnerships](#) was set up to accelerate the implementation of NSF-funded discoveries from research to new industries, especially in technologies where the US faced the greatest competition. According to [Reuters](#), the directorate lost 20 percent of its staff last week.

Similarly, NASA, currently ranked first in [space launch systems](#) research in the Tech Tracker, may face a [10 percent cut to its specialised workforce](#). These massive cuts have been put on hold, but if they resume, the loss of talent would be a blow to an important component of the technological race, especially with a worldwide shortage of tech specialists. Historically, US space and satellite companies have benefited from NASA's decades-long public investments in research and development.

O Ocidente está a perder a vantagem tecnológica-militar? (24) [FONTE: Science, 6/12/2024]

EDITORIAL

Science and America's challenge

Today, more than at any time since World War II, the United States is being challenged scientifically on the global stage. Unfortunately, the nation is not meeting the moment. With a new administration in the wings, the country must begin to monitor scientific advancements to avoid technological surprise and develop strategies to close the critical technologies gap.

Despite a substantial increase in privately and publicly funded research over the past 30 years, Western democracies are losing the technology competition. In 2023, the Australian Strategic Policy Institute began tracking the pace of scientific advancement and found that China leads in 37 of 44 critical technologies—from advanced materials and quantum physics to robotics, biotechnology, and artificial intelligence. This reversal demonstrates that the United States and Western countries are losing scientific leadership. The consequences are not merely academic. If the trend does not change quickly, risks to economic stability and national security will grow.

There are a few things that the United States can do immediately to start turning things around. It must develop a robust way to

essential for this push to succeed. Indeed, many state leaders have recognized the connection between economic opportunity and talent development by investing in research and higher education. Texas is second only to the National Institutes of Health in funding cancer research, for example. And most states heavily subsidize college education at public universities. In New Mexico, oil and gas tax revenue pays university tuition and fees for students willing to work hard. This renewed effort should prioritize advanced education for precollege teachers in science and mathematics and offer an array of scholarships for undergraduate and graduate students in science, technology, engineering, and mathematics (STEM), particularly at public universities that have kept the cost of quality education reasonable.

It's also time for a national science strategy that invigorates public interest in, and enthusiasm for, science. This strategy must attract American students to pursue advanced education in science and engineering. Today, 20% of high-impact academic papers in STEM fields are written by researchers in China who were educated in the West—often at US taxpayer expense. This is an alarming indication that the

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“...the United States and Western countries are losing scientific leadership.”

O Ocidente está a perder a vantagem tecnológica-militar? (25) [FONTE: Science, 6/12/2024]

EDITORIAL

to prevent surprise. US intelligence agencies are designed to track real-time threats such as the launch of ballistic missiles, the massing of land forces, or incremental improvements in existing weapons. But none of the nation's 17 intelligence agencies is tasked with systematically scanning the scientific and technological horizon to determine where innovation is most threatening. Although most in the intelligence community and military agree that this is important, no one thinks it's their problem to fix. Congressional action is needed to set in motion a solution.

The situation also calls for legislation that supports education and training that better prepares a US workforce to thrive in fast-paced fields across the sciences. This strategy has a strong precedent. In 1958, in response to the space race with the Soviet Union, the US passed the National Defense Education Act to bolster the country's education system and meet the demands posed by competition in science and technology. An equally bold action today could reignite this ambition. Partnerships with states and private industry would be

innovative thinking, knowledge generation, evidence-based problem-solving, and societal progress.

America will build the massive data centers and generate the energy to power them. These will be critical to America's future. It is expected that artificial intelligence will accelerate hypothesis formulation, experimental design, and data analysis. The limiting factor will be people to conduct the research suggested by AI-generated hypotheses at Western universities. Well-educated Western researchers must have access to computing power and data to accelerate discovery.

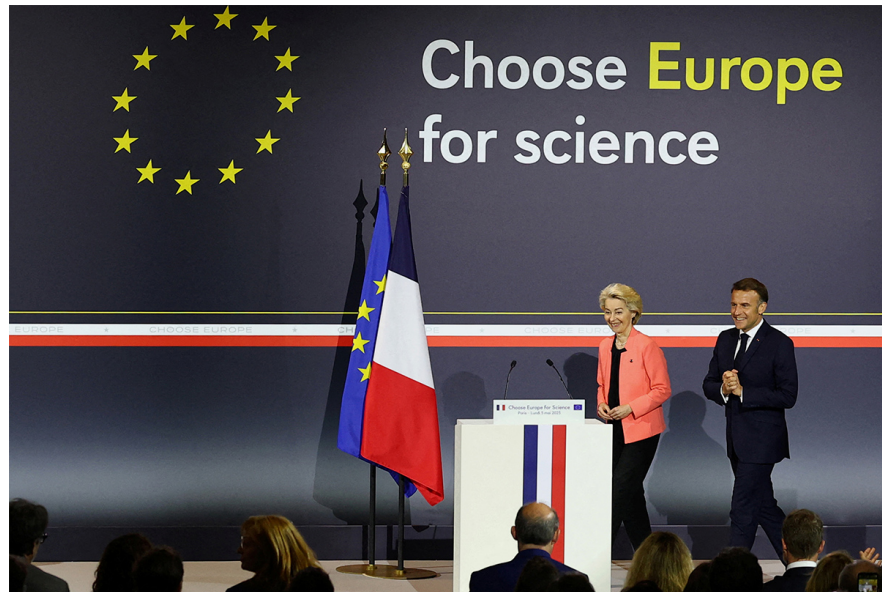
It often takes a crisis or a substantial failure to galvanize national sentiment and inspire leaders to meet new challenges and threats in a substantially different way. The United States can take comfort in knowing that it has strong alliances in scientific research with like-minded states, which must be fortified as part of its national science strategy. But it is time for the nation to critically examine its own current place in the world of science and consider the perils of allowing this new status quo.

–Heather Wilson

O Ocidente está a perder a vantagem tecnológica-militar? (26) [FONTE: Science, 5/05/2025]

Europe pledges €600 million to lure foreign researchers, vows to protect scientific freedom

New campaign, Choose Science for Europe, aims to recruit talent from countries where science is under siege



At a conference in Paris today, French President Emmanuel Macron (right) and European Commission President Ursula von der Leyen stressed Europe's commitment to scientific freedom and pledged €600 million to lure foreign talent. Gonzalo Fuentes/POOL/AFP via Getty Images

O Ocidente está a perder a vantagem tecnológica-militar? (27) [FONTE: Science, 5/05/2025]

Europe is getting serious about its attempts to lure U.S. researchers who have lost their jobs or want to leave the country because of the assault on research by President Donald Trump's administration. At a conference at the Sorbonne in Paris today, European Commission President Ursula von der Leyen launched a new campaign, Choose Europe for Science, and said the European Union would budget €500 million in new money in the years 2025–27 "to make Europe a magnet for researchers."

French President Emmanuel Macron said France would separately spend €100 million out of its €54 billion France 2030 investment plan to attract foreign talent. The government plans to enlist the private sector and local authorities to contribute as well.

"Unfortunately ... the role of science in today's world is questioned. The investment in fundamental, free, and open research is questioned," von der Leyen said, without naming the United States specifically. "What a gigantic miscalculation." In contrast, she said, Europe is "choosing to place research and innovation, science and technology at the heart of our economy."

O Ocidente está a perder a vantagem tecnológica-militar? (28) [FONTE: Science, 5/05/2025]

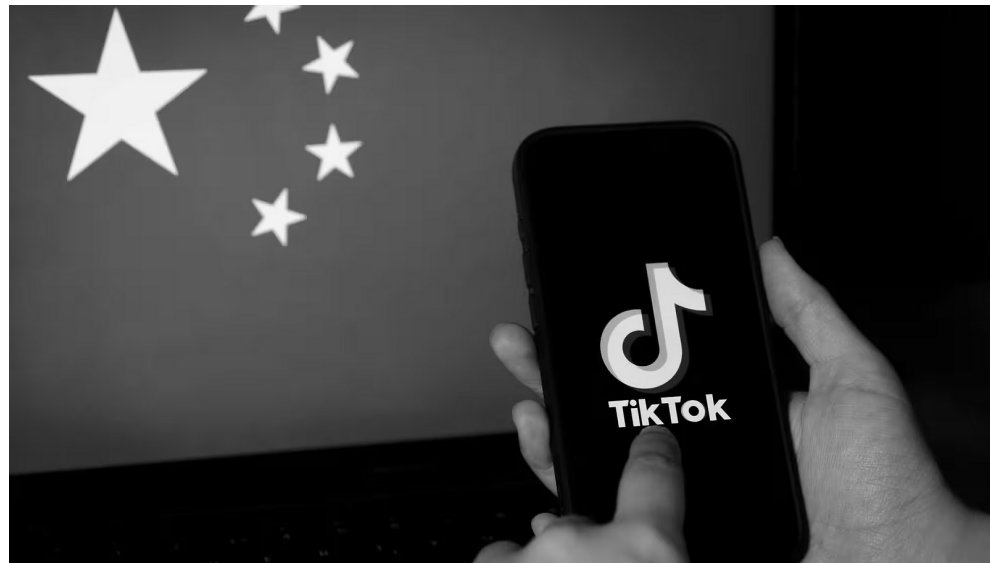
Von der Leyen also said she wanted to create a new, 7-year “supergrant” from the European Research Council (ERC) that would go to “the very best” researchers, enabling them to take a long-term perspective. She noted that, through 2027, ERC is doubling, [from €1 million to €2 million](#), the value of grants that cover the cost of relocating to Europe and setting up a new lab.

In France, the online Choose France for Science platform has attracted 30,000 visitors from 157 countries since its launch in mid-April, Macron’s office said today. Of those, 34% were from the U.S. Several hundred scientists have already filed applications to continue their careers in France.

Although European funding can’t replace the billions that have vanished from U.S. research budgets—along with thousands of jobs—some scientists welcomed Europe’s gesture. Six hundred million Euros is “not enormous, but not negligible either,” says immunologist Alain Fischer, a former president of the French Academy of Sciences. “I hope other countries will follow the example,” he says.

O Ocidente está a perder a vantagem tecnológica-militar? (29) [FONTE: Arthur Herman / Hudson Institute, 24/0/2024]

Why America Is Losing the High-Tech War with China



For the past decade the United States and China have been waging a high-tech “cold war” to determine the future not only of the world’s economy, but humanity. Who wins, and who loses, will set the future of East Asia, as well.

China has a well thought out plan to win this contest. The United States does not. It’s going to be up to the other advanced tech democracies like the Republic of Korea, Japan, and the members of the EU to help the U.S. find that winning strategy, so that we don’t all end up becoming mere tributaries to the Communist masters of the Middle Kingdom.

O Ocidente está a perder a vantagem tecnológica-militar? (30)

[FONTE: Arthur Herman / Hudson Institute, 24/0/2024]

The fact that a Chinese-engineered app could sweep in and dominate the American tech space is not a good sign for the health of our vaunted high-tech sector. The real question should be, how did Chinese engineers manage to surge forward like this, while making Facebook and X and Instagram look like rank amateurs—even Google and Amazon.

There's a broader lesson here. Americans don't have a plan to win the

high-tech war with China because they've been used to dominating the high-tech horizon for more than half a century, since World War Two in fact. Nuclear weapons and nuclear power; computers and semiconducting microchips; telecommunications and the Internet; even AI and the quantum computer; America has been the traditional leader in all these areas.

History shows that success can breed complacency. In the past decade China has surging ahead in high-tech production and innovation, of which the TikTok phenomenon is only part. Before that, China's effort in the high-tech arena was largely limited to cyber theft. Thanks to IP appropriated or stolen from foreign companies doing business in China, Beijing has the technical expertise to focus on developing their own platforms and algorithms, which are aimed directly at displacing the US as the world's tech giant. From that perspective, the TikTok story is a narrative all too familiar in other realms of the high-tech universe.

O Ocidente está a perder a vantagem tecnológica-militar? (31)

[FONTE: Arthur Herman / Hudson Institute, 24/0/2024]

On AI research, for example, China produced about one-third of both AI journal papers and AI citations worldwide in 2021. In economic investment, China accounted for nearly one-fifth of global private investment funding in 2021, attracting \$17 billion for AI start-ups. The gap with the US is still significant, but it's closing. And while Americans fret about whether AI will allow college students to cheat on their term papers, the Chinese are using AI applications to transform their industrial base and scale new heights of economic productivity.

Turning to 5G communication, for a time under the Obama administration it looked like Chinese tech equipment giant Huawei was running away with building the global networks that would support 5G use, including with NATO allies. Then some of us sounded the alarm about Huawei's access to the most important strategic commodity of all, data, which meant access for China's military and intelligence establishment.

O Ocidente está a perder a vantagem tecnológica-militar? (32)

[FONTE: Arthur Herman / Hudson Institute, 24/0/2024]

All this raises the obvious question: why is the US losing this all-important high-tech contest?

One reason is that decision-makers in Washington simply don't understand the technologies they are passing laws about, including AI and quantum. They also do not understand how to attract and incentivize America's biggest and best tech companies to tackle our most pressing national security problems together, instead of just seeing 5G, AI, and space as another zone for competition with their commercial rivals. Chinese companies have no choice; they must obey Beijing's dictates to support China's military and China's larger geopolitical strategy. The US government has to work to change the mindset of America's companies first, in order to get their full-fledged cooperation and support. That's hard in an decision ecosystem dominated by lawyers and businessmen, instead of business leaders and tech experts.

The other problem is that the U.S. needs to realize that allies like ROK and Japan, can help to solve these challenges. This is why the current flap over the Line social media app is so unnecessary and misguided: it detracts from where attention should be really focused, on how we can all work together to build a democratic high-tech future.

O Ocidente está a perder a vantagem tecnológica-militar? (33) [FONTE: Navin Girishankar / CSIS, 28/03/2025]

Fighting a Trade War Could Mean Losing the Tech War



Photo: Al Drago/Bloomberg via Getty Images

O Ocidente está a perder a vantagem tecnológica-militar? (34) [FONTE: Navin Girishankar / CSIS, 28/03/2025]

President Trump's ambitious attempt to rapidly reorder U.S. economic relations in the early months of his administration centers on the expansive, if chaotic, use of tariffs on adversaries and allies alike. With a new round of reciprocal tariffs set to go into effect on April 2, what some senior officials have called "Liberation Day," much of the current discussion is overlooking the biggest risk of these measures: A multifront trade war will weaken the United States' ability to compete on the critical and emerging technologies that will be essential to the administration's economic growth and national security goals.

Indeed, the enduring test of the America First Trade Policy is not its short-term effect on the merchandise trade deficit or fentanyl interdiction by neighbors, but its impact on the United States' ability to innovate and scale critical and emerging technologies. And China is ready to pounce on strategic missteps by the United States to lock in decisive technological advantages. The risk has never been higher.

O Ocidente está a perder a vantagem tecnológica-militar? (35) [FONTE: Navin Girishankar / CSIS, 28/03/2025]

Countries that establish and sustain advantages across these technologies will shape the coming economic order. They will be positioned to set technology standards in global markets. They will control technology supply chains and choke points. They will be able to shape the future of work and jobs. And they are more likely to have the first-mover advantage in gaining market share for tech-enabled goods and services. Those countries that cannot do these things will fall behind.

By most assessments, the United States currently maintains an edge in a number of critical and emerging technologies such as artificial intelligence, leading-edge semiconductor design, biotechnologies, pharmaceuticals, supercomputing, and quantum computing, but China is catching up. In other technologies, however, China already leads—for instance, in cryptocurrency, small drones, e-commerce, electric vehicles, facial recognition, mobile device manufacturing, high speed rail, hypersonics, solar and wind energy, and telecommunications.

O Ocidente está a perder a vantagem tecnológica-militar? (36) [FONTE: Navin Girishankar / CSIS, 28/03/2025]

It is true that China has long engaged in unfair trade practices, intellectual property theft, and outright sabotage of assets (and these must be addressed, including with tariffs). But it would be wrong to conclude that mercantilist and malign actions alone have led to China's technological rise. Let's acknowledge China's strengths: quality scientific research, prodigious STEM talent, an ability to move rapidly from "lab to market," dominance in processed critical minerals, a capacity to scale commercial production, and access to markets worldwide, especially in the Global South. Notably, China is well-integrated into most major technology value chains.

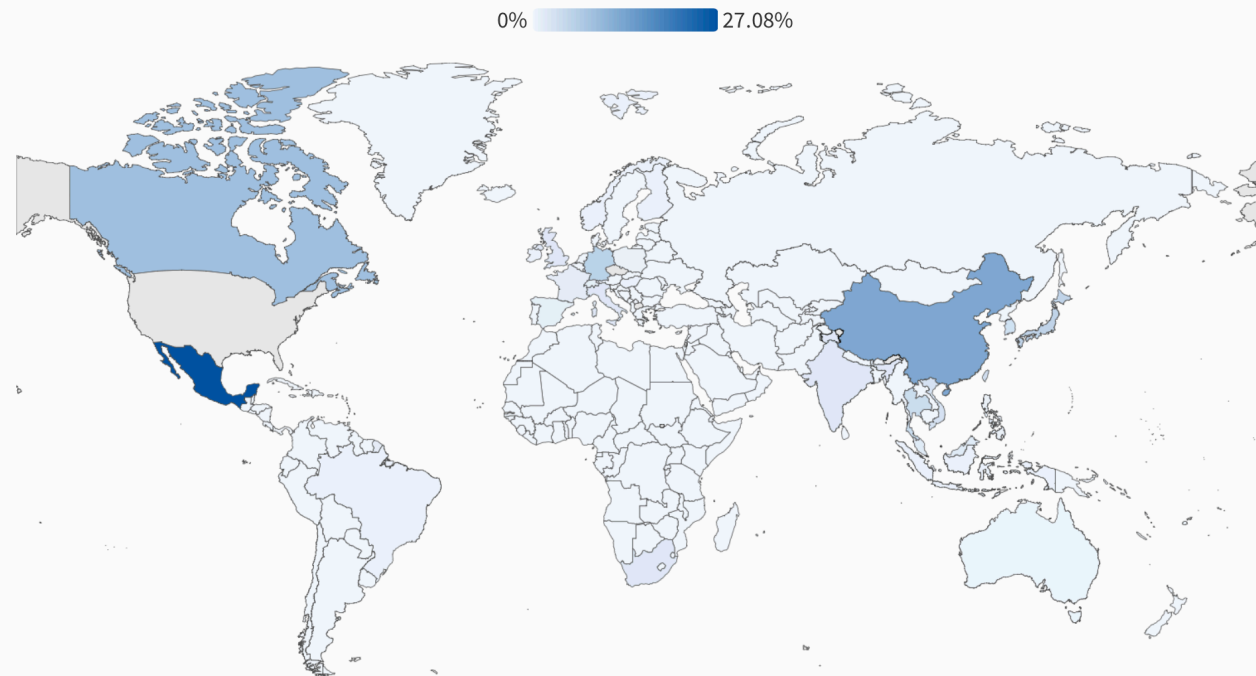
That is the essential point: Technology value chains are global in nature. They comprise complex research, trade, commercial, and investment ties that crisscross the world, from advanced economies in Asia and Europe to middle-income countries in Latin America and developing countries in Africa and South Asia. To compete, U.S. companies, big and small, need reliable access to critical and cost-competitive inputs, stable ties with suppliers of those inputs (Figure 1), and strong protections from intellectual property (IP) theft and industrial espionage. They also need foreign direct investment and access to export markets. The volatility of tariffs and retaliations, at a minimum, cuts against a stable technology environment. More likely than not, a multifront trade war would pose major obstacles to U.S.

O Ocidente está a perder a vantagem tecnológica-militar? (37) [FONTE: Navin Girishankar / CSIS, 28/03/2025]

Figure 1: U.S. Reliance on Inputs to Critical and Technology Supply Chains, by Country

Value of U.S. imported inputs as a share of total imported input value by country in select critical and technology supply chains, 2024

Select a supply chain: **Fuel Cells**



Note: Data is not displayed for certain geographies.

Source: CSIS calculations based on U.S. International Trade Commission's [DataWeb](#) from official U.S. merchandise trade statistics published by the U.S. Department of Commerce, Census Bureau, data extracted on March 27, 2025, and "ITA Federal Register Notice on [Draft List of EO 14017 Critical Supply Chains: Draft List of Critical Supply Chains](#)," International Trade Administration, data extracted on March 27, 2025.

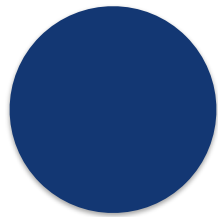
CSIS

ECONOMIC SECURITY AND
TECHNOLOGY DEPARTMENT

O Ocidente está a perder a vantagem tecnológica-militar? (38) [FONTE: Navin Girishankar / CSIS, 28/03/2025]

Take the case of the semiconductor industry, which includes chip designers, foundries, equipment providers, and material suppliers across the world. U.S. companies such as NVIDIA, Qualcomm, and Intel lead in the design of advanced chips, but they depend on chip makers in Taiwan and South Korea. They in turn depend on equipment providers in Japan and the Netherlands, and processed materials from China. Tariffs on imports from China, Mexico, and Canada; tariffs on steel and aluminum; and reciprocal tariffs on other countries add uncertainty and costs to U.S. chipmaking prospects. They may alter investor expectations and provoke retaliatory measures akin to China's tit-for-tat tariffs and export controls on critical minerals.

Efforts to attract investment in U.S. chipmaking to Arizona, New York, Ohio, and other states (under the CHIPS and Science Act and via Trump announcements of massive investments from Taiwan and the United Arab Emirates) are laudable. Tariff threats may have induced these moves, but whether real investments materialize primarily depends not on tariffs but on other factors such as tax incentives, talent, and regulations. On the contrary, tariffs on chip inputs render U.S. chipmaking more expensive in the short run, while shielding U.S. domiciled companies from market pressures essential to their competitiveness and innovation over time. That's bad for the AI revolution, which will depend on access to leading-edge chips.



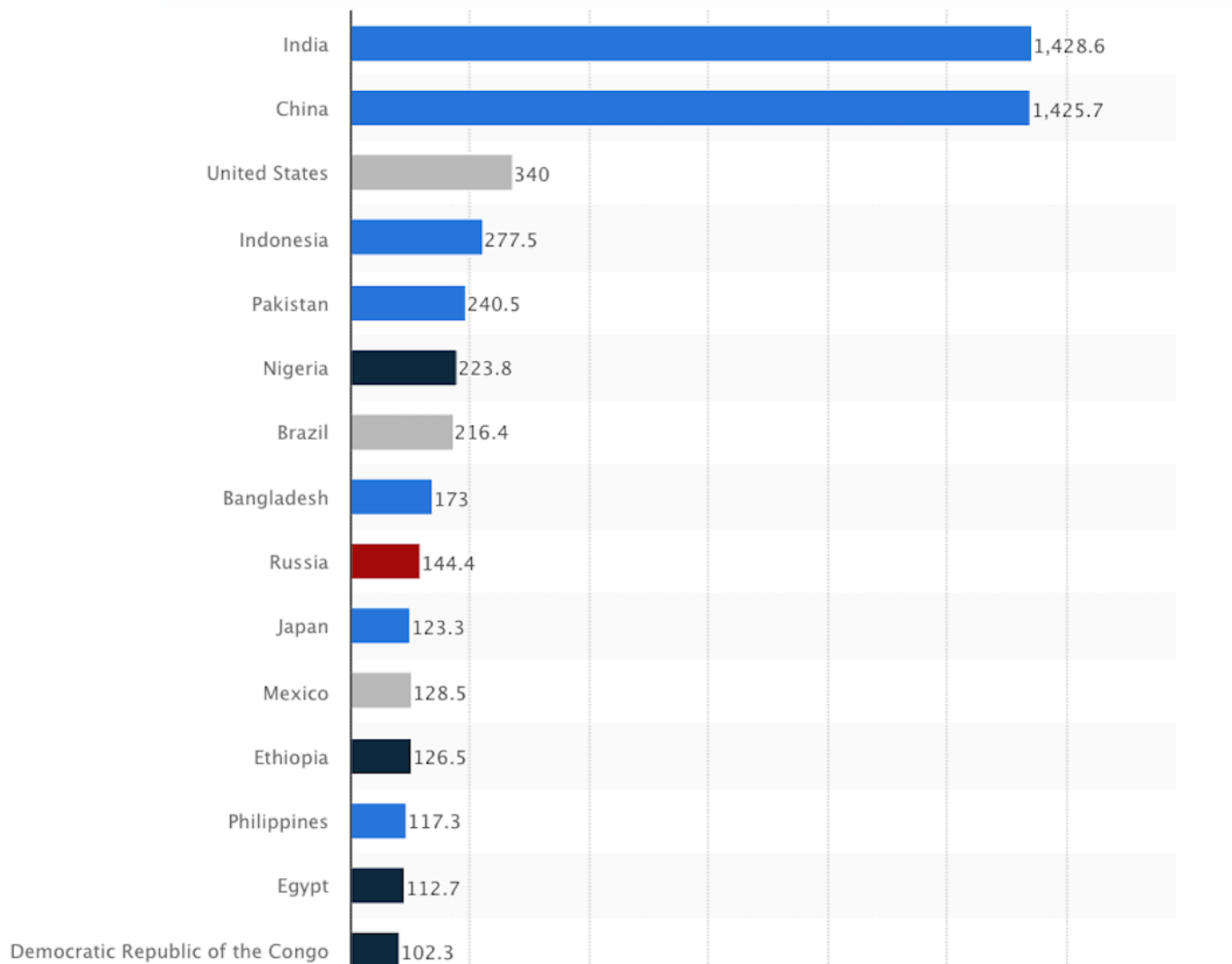
PARTE II – NOTAS BREVES

A estratégia de ascensão da Índia: entre a economia e a política (1) [FONTE: Encyclopaedia Britannica]



A estratégia de ascensão da Índia: entre a economia e a política (2) [FONTE: Statista, 2023]

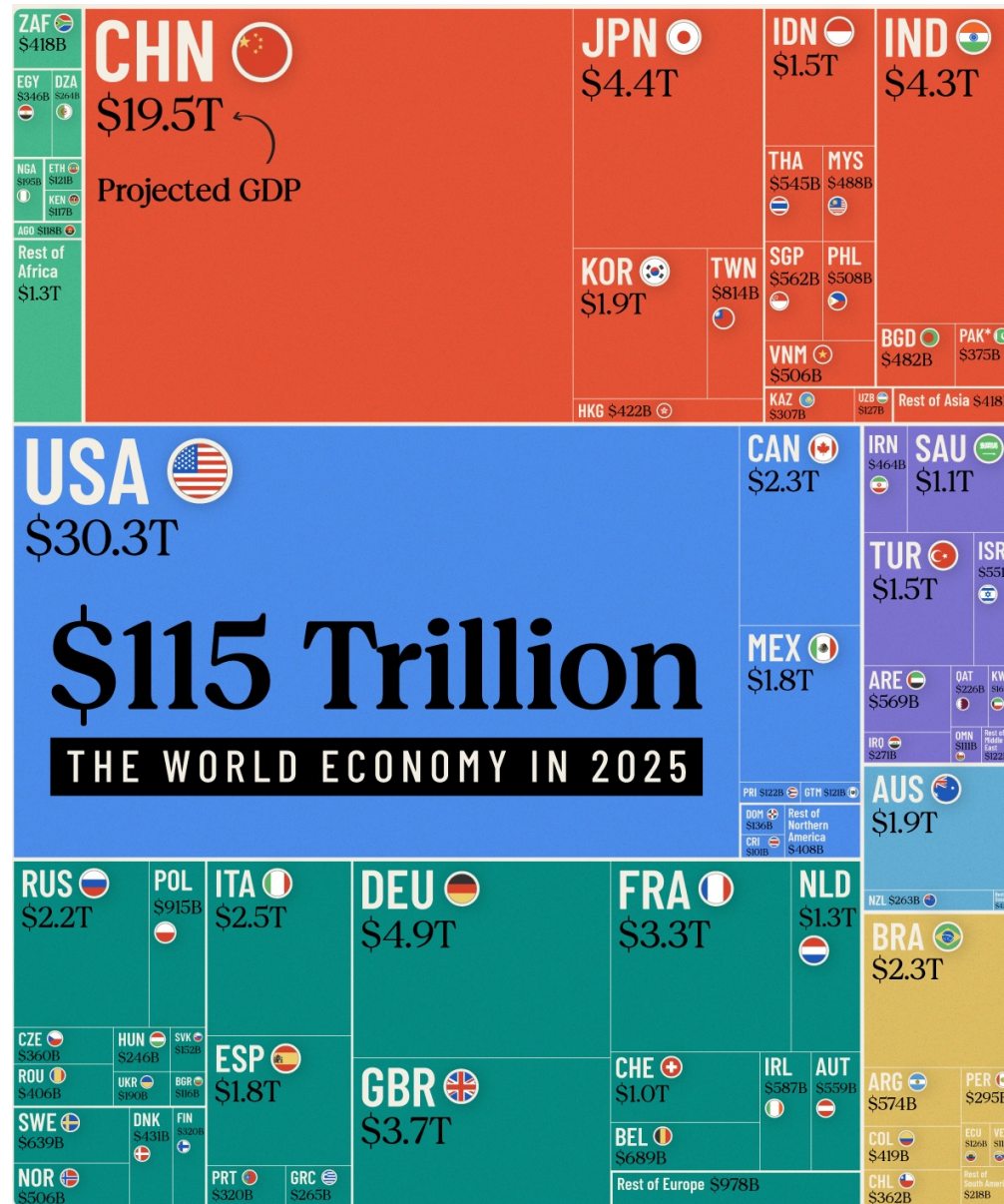
Twenty countries with the largest population in mid-2023
(in millions)



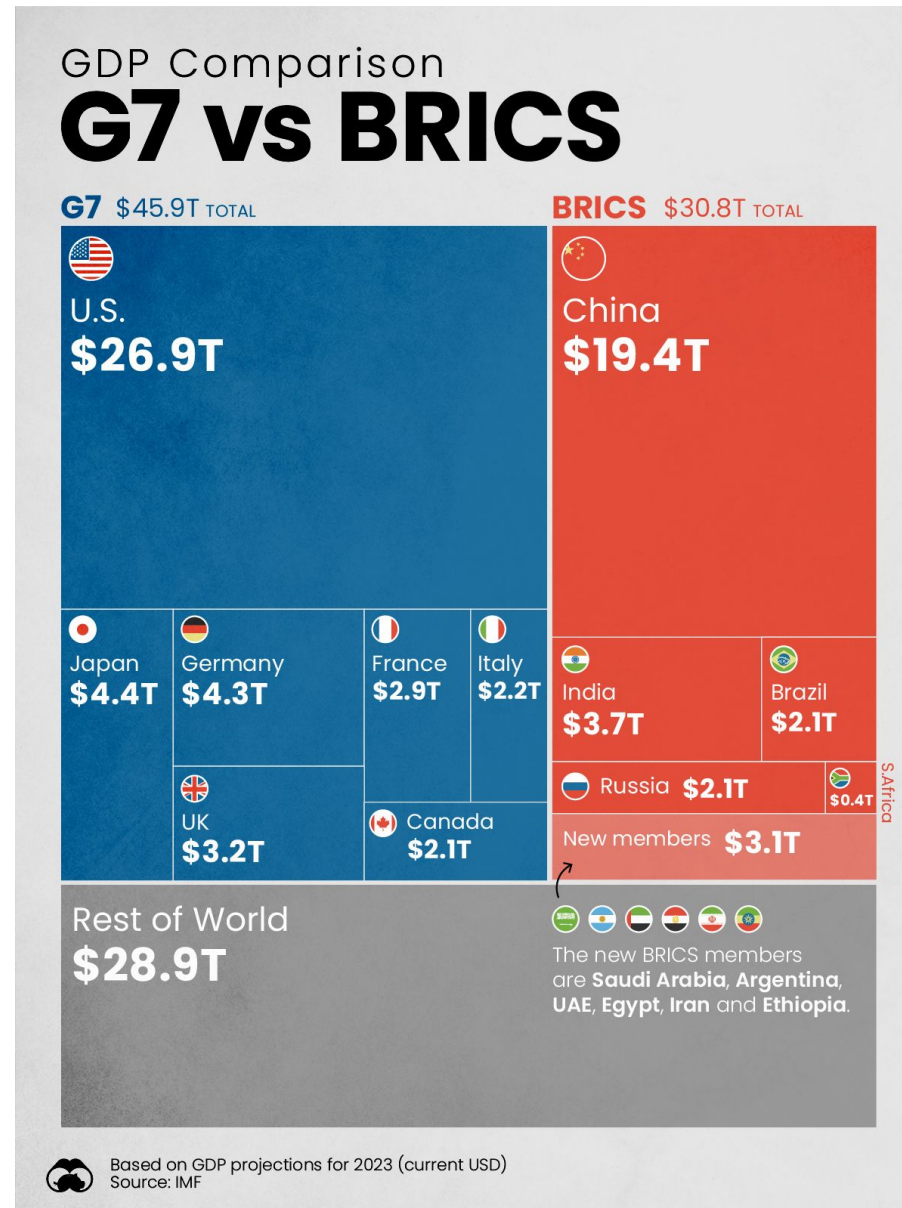
A estratégia de ascensão da Índia: entre a economia e a política (3) [FONTE: Visual Capitalist, 18/12/2022]



A estratégia de ascensão da Índia: entre a economia e a política (4) [FONTE: Visual Capitalist, 19/12/2024]

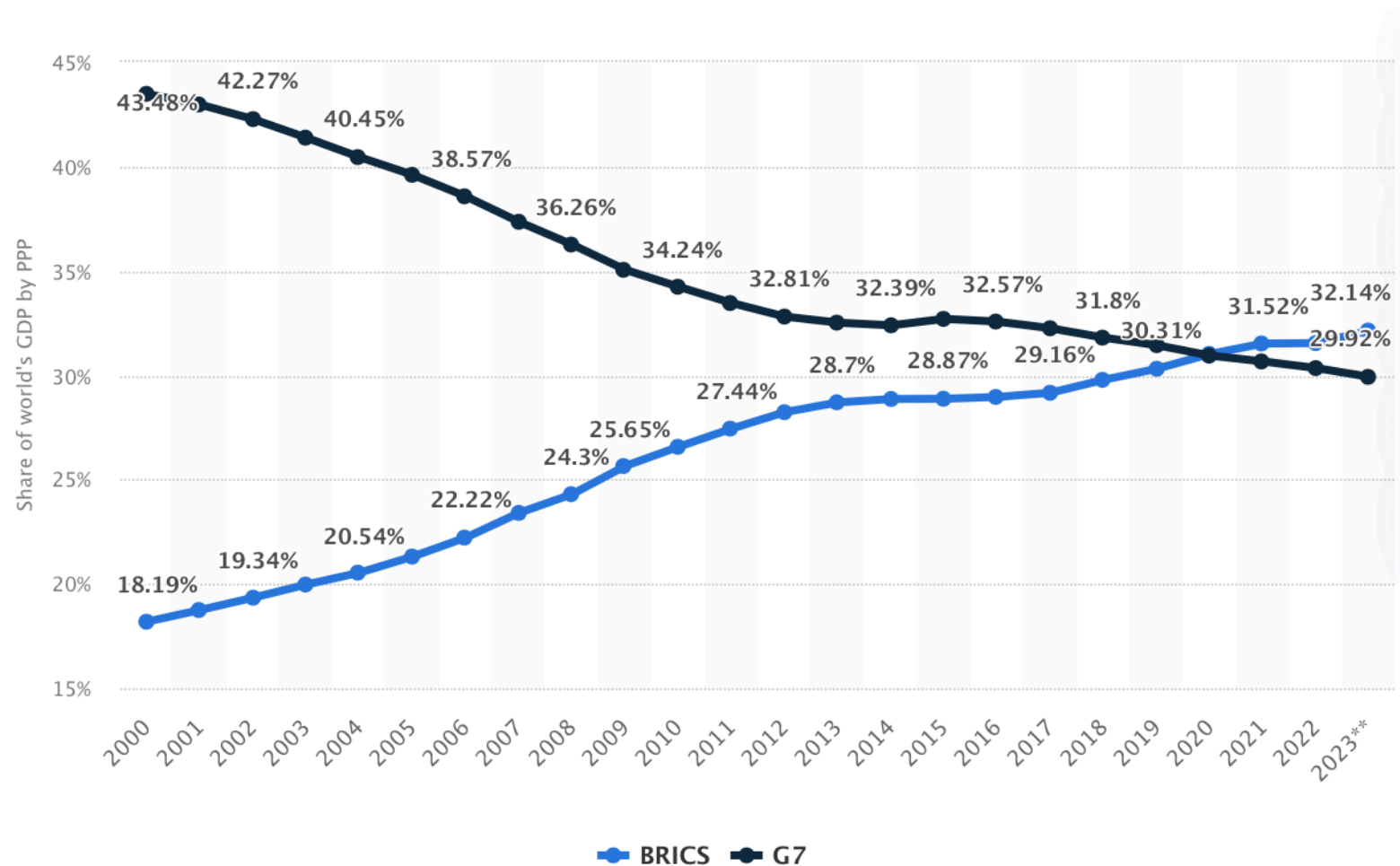


A estratégia de ascensão da Índia: entre a economia e a política (5) [FONTE: Visual Capitalist, 23/10/2023]



A estratégia de ascensão da Índia: entre a economia e a política (6) [FONTE: Statista, 23/10/2023]

BRICS and G7 countries' share of the world's total gross domestic product (GDP) in purchasing power parity (PPP) from 2000 to 2023



A estratégia de ascensão da Índia: entre a economia e a política (7)

[FONTE: Fórum Económico Mundial, 17/04/2025]



The future of jobs in India: employers seek to boost tech talent to drive AI and digital growth

Apr 17, 2025

When Indian prime minister Narendra Modi began his third term in June 2024, he set out an [ambitious tech agenda](#) to help make the country a digital leader. This included the [IndiaAI Mission](#) and programmes to boost skills in areas from cybersecurity to data management.

He will hope that as well as attracting new talent to these areas, it will encourage existing talent to stay. Around 18 million people a year currently leave the country to find work – close to double the number leaving any other nation – and it is [hitting the tech sector hard, with a third of top graduates from the prestigious Indian Institutes of Technology among those emigrating](#).

A estratégia de ascensão da Índia: entre a economia e a política (8)

[FONTE: Fórum Económico Mundial,

17/04/2025]

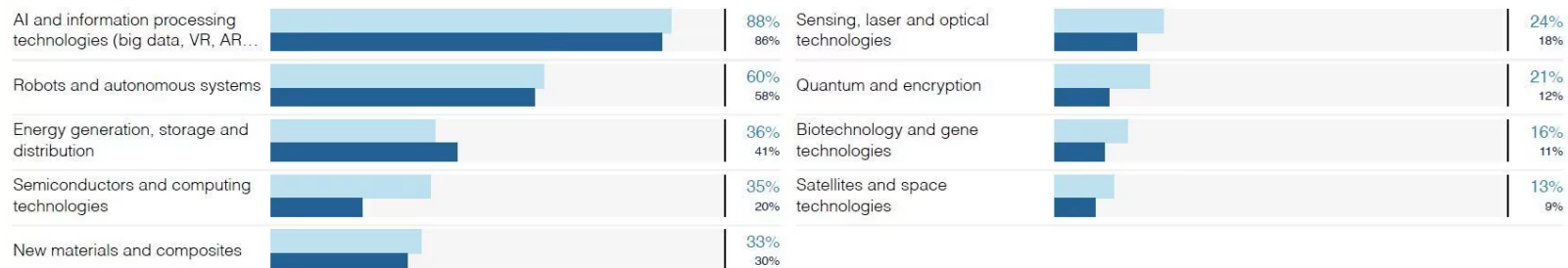
But the business landscape is transforming, with organizations citing three leading drivers of expected change by 2030: increased digital access, climate-mitigation efforts and geopolitical tensions.

The first two of these trends are driving heavy investment in AI, robotics and autonomous systems, as well as in energy technologies. Employers in India expect to outpace global adoption of certain technologies, with 35% believing that semiconductors and computing technologies will transform their operations this decade, while 21% see quantum computing and encryption as leading catalysts for change.

Technology trends driving business transformation

Share of organizations surveyed that identify the technology trend as likely to drive business transformation

■ Economy ■ Global



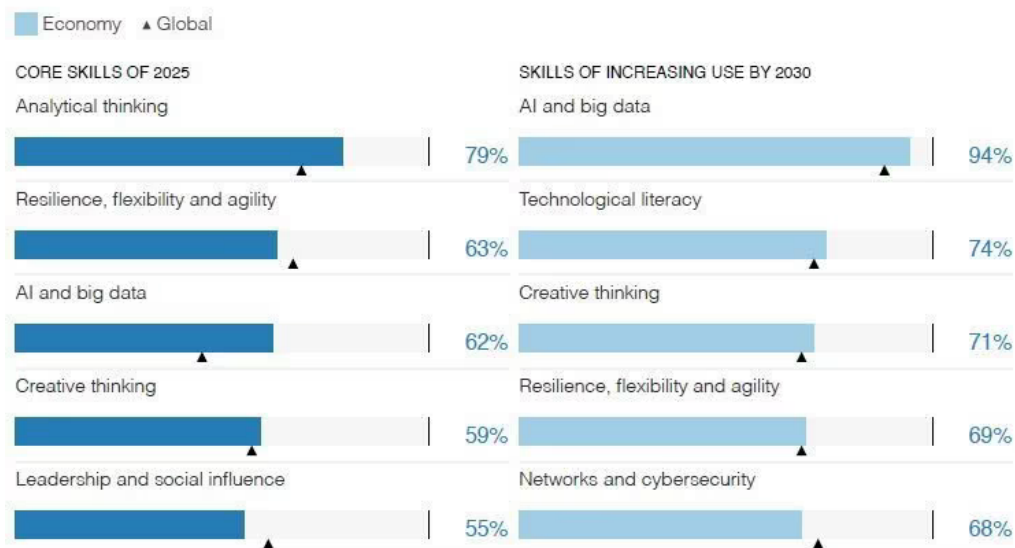
A estratégia de ascensão da Índia: entre a economia e a política (9)

[FONTE: Fórum Económico Mundial,

17/04/2025]

Skills of increasing use by 2030

Skills of the most increase in use by 2030

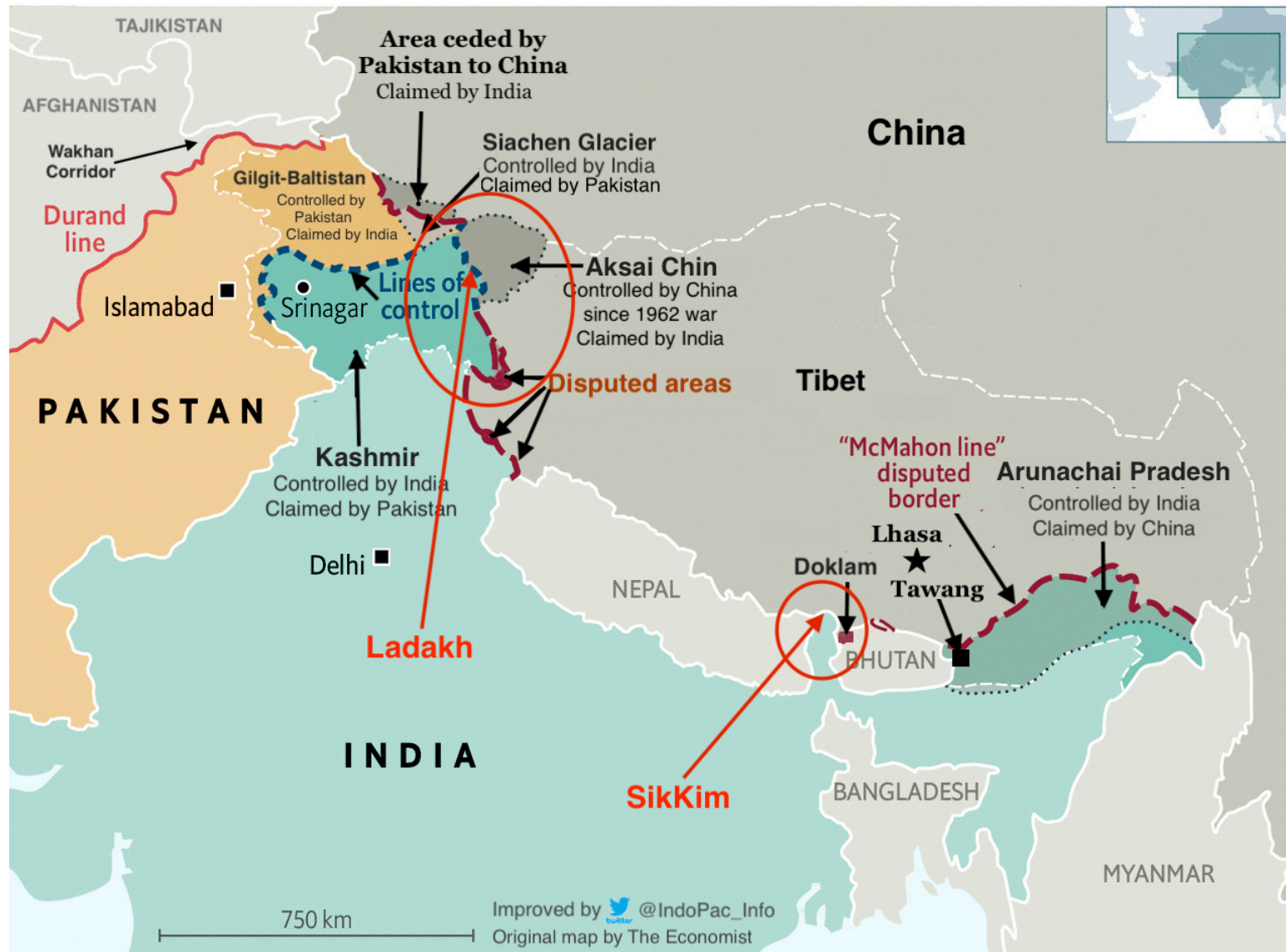


India, with its population of more than 1 billion, already has one of [the world's biggest bodies of talent in science, technology, engineering, and mathematics](#). Yet much of the country's [top tech graduates heads to the US and Europe](#), where opportunities for career progression appear greater, salaries are higher and the overall work-life balance and potential quality of life seem more attractive.

However, initiatives such as the [India Skills Accelerator](#) are working to change this by showing the country's young people that they can build skills and careers at home.

A estratégia de ascensão da Índia: entre a economia e a política (10)

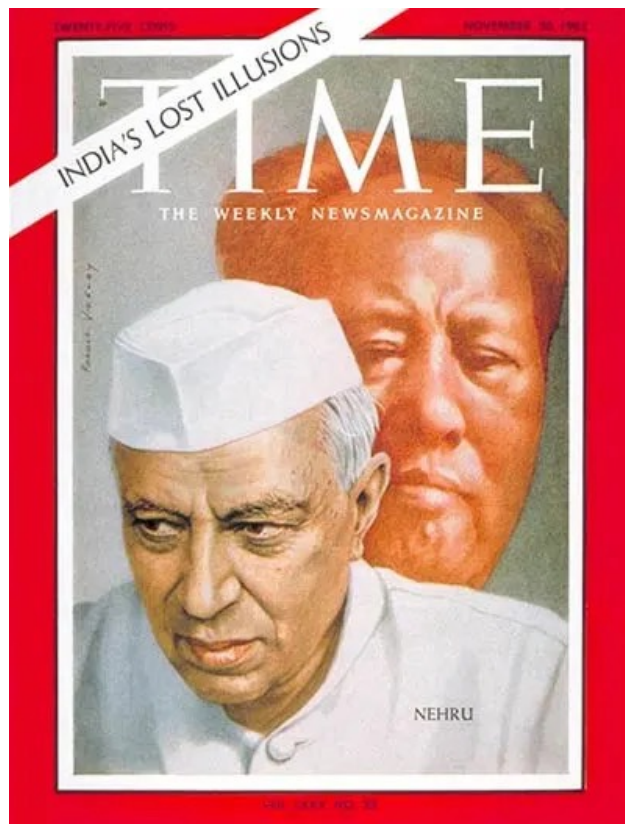
[FONTE: Indo-Pacific News / Geo-Politics & Defense News (The Economist)]



A estratégia de ascensão da Índia: entre a economia e a política (11) [FONTE: Time, 21/10/2012]

The Sino-Indian War: 50 Years Later, Will India and China Clash Again?

Fifty years after China and India last went to war, the conflict's legacy still smolders and haunts relations between these two rising Asian powers.



Larry Burrows / Time Life Pictures / Getty Images

Indian troops training for the border war with China.

The only major war in modern history fought between India and China ended almost as abruptly as it began. On Oct. 20, 1962, a multi-pronged Chinese offensive burst the glacial stillness of the Himalayas and overwhelmed India's unprepared and ill-equipped defenses, scattering its soldiers. Within days, the Chinese had wrested control of Kashmir's Aksai

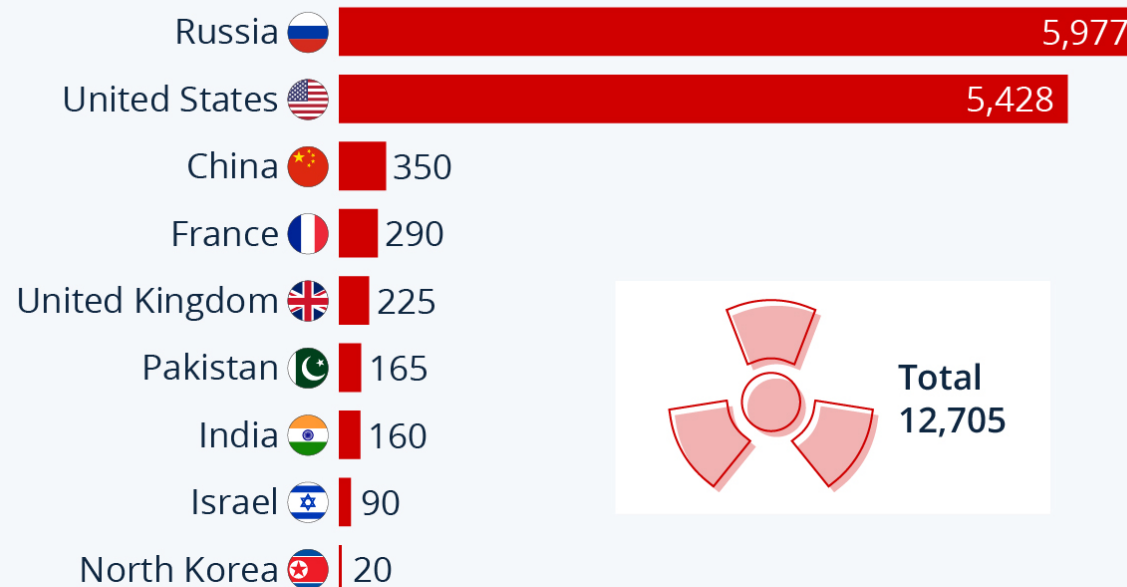
A estratégia de ascensão da Índia: entre a economia e a política (12) [FONTE: Time, 21/10/2012]

At the core of the disagreement is the McMahon Line, an imprecise, meandering boundary drawn in 1914 by British colonial officials and representatives of the then independent Tibetan state. China, of course, refuses to recognize that line, and still refers much of its territorial claims to the maps and atlases of the long-vanished Qing dynasty, whose ethnic Manchu emperors maintained loose suzerainty over the Tibetan plateau. In 1962, flimsy history, confusion over the border's very location and the imperatives of two relatively young states—Mao's People's Republic and newly independent India led by Prime Minister Jawaharlal Nehru—led to China humiliating India in a crushing defeat where, by some accounts, both sides lost upwards of 2,000 soldiers. In 1962, TIME described the Chinese offensive as a "human-sea assault," like a "swarm of red ants" toting burp-guns. Beijing seized and has never relinquished Aksai Chin—"the desert of white stone"—a strategic corridor that links Tibet to the western Chinese region of Xinjiang. "The India-China war took place through a complex series of actions misunderstandings," says Kishan S. Rana, a former Indian diplomat and honorary fellow at the Institute of Chinese Studies in New Delhi. "Bilateral relations are, however, moving forward. The border, despite unresolved issues, today is a quiet border."

A estratégia de ascensão da Índia: entre a economia e a política (13) [FONTE: Statista (2022)]

The Countries Holding The World's Nuclear Arsenal

Estimated global nuclear warhead inventories (2022)*



* Includes deployed, stockpiled and retired warheads awaiting disarmament

Source: Federation of American Scientists



estratégia de ascensão da Índia: entre a economia e a política (14)

[FONTE: Carnegie Endowment for International Peace, 2022, Setembro]



A estratégia de ascensão da Índia: entre a economia e a política (15)

[FONTE: Carnegie Endowment for International Peace, 2022, Setembro]

The Cold War Foundation

For most of the Cold War, the Soviet Union and India enjoyed warm relations, and at times were even closely aligned. India's leaders and intellectuals believed that the USSR offered lessons for their country, which was determined to industrialize rapidly while combining growth with a reduction in poverty and stark economic inequalities. Moreover, ex-colonial countries like India did not regard the Soviet Union as an imperial power of which they ought to be leery.

The Soviet view of India—and of other colonies that gained independence in the first decade of the Cold War—was initially not so charitable. So extensive were the ties—economic, cultural, and institutional—between ex-colonies and their former rulers that Soviet leaders and ideologists did not regard them as authentically independent. As Soviet Marxist jargon had it, they were ruled by a “comprador bourgeois” class economically, and therefore politically beholden to former colonial overlords. Meanwhile, India, as one of the leading lights in the Non-Aligned Movement, was determined to stay clear of Cold War rivalries and to play a neutral international role. In the early postcolonial years that coincided with the beginning of the Cold War, Moscow dismissed such aspirations and even directed the pro-Soviet Communist Party of India to pursue the path of revolution against the country's “bourgeois nationalist” governments.¹⁴



A estratégia de ascensão da Índia: entre a economia e a política (16)

[FONTE: Carnegie Endowment for International Peace, 2022, Setembro]

After the Cold War: A New Dynamic

The end of the Cold War proved highly consequential for the pillars of the relationship between Moscow and New Delhi—arms sales, economic and technical aid, and the geopolitical dynamics between China, India, Pakistan, Russia, and the United States. Russia emerged from the Cold War as a much less important, albeit still valued, partner for India with respect to all three of these fundamentals.

Arms Sales—Ties That Endure

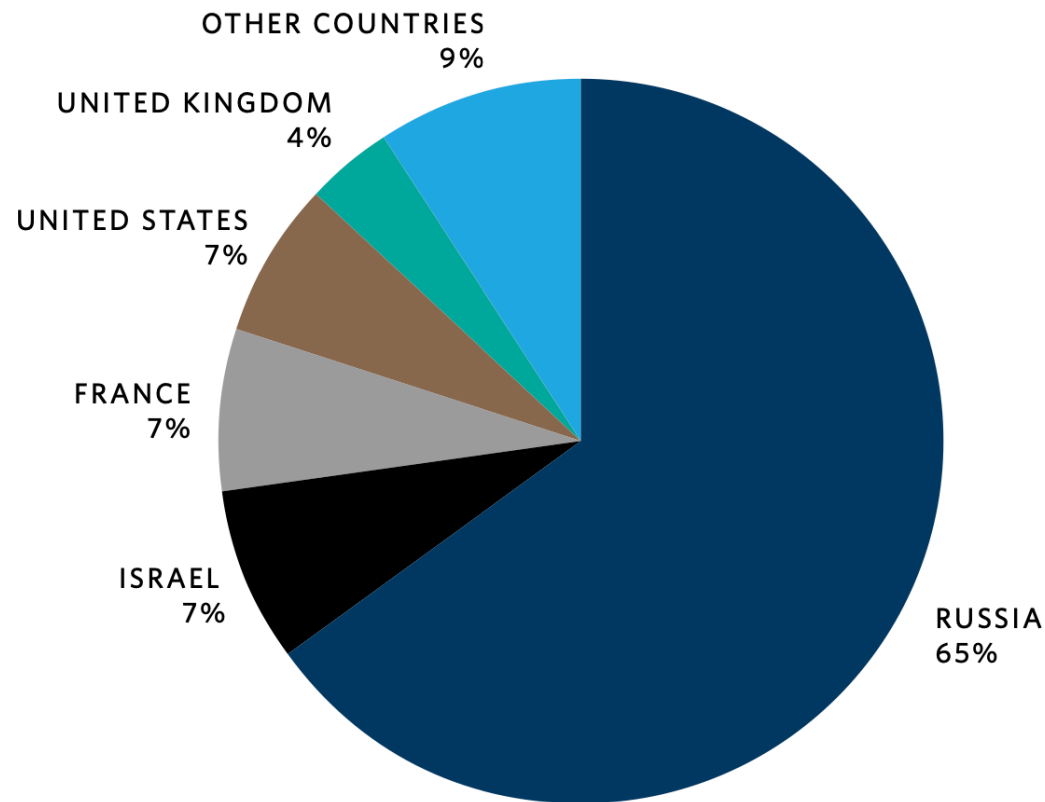
Arms sales continued to be the most important element of Russian-Indian relations in the post–Cold War years. As Figure 3 demonstrates, Russia has supplied two-thirds of India’s total arms purchases since the Cold War ended.

Russia benefits from the large share of Soviet and Russian legacy systems in the Indian arsenal. The overwhelming majority of India’s armored force consists of Soviet/Russian tanks—the T-72 and T-90S—and so does its fleet of ground-attack aircraft—variants of MiG-21, Su-30, and MiG-29.²⁴ Over half of India’s conventional submarines are of Soviet design. So are all of its aerial refueling tankers (Il-78s) as well as its only aircraft carrier and nuclear-powered submarine.²⁵

A estratégia de ascensão da Índia: entre a economia e a política (17)

[FONTE: Carnegie Endowment for International Peace, 2022, Setembro]

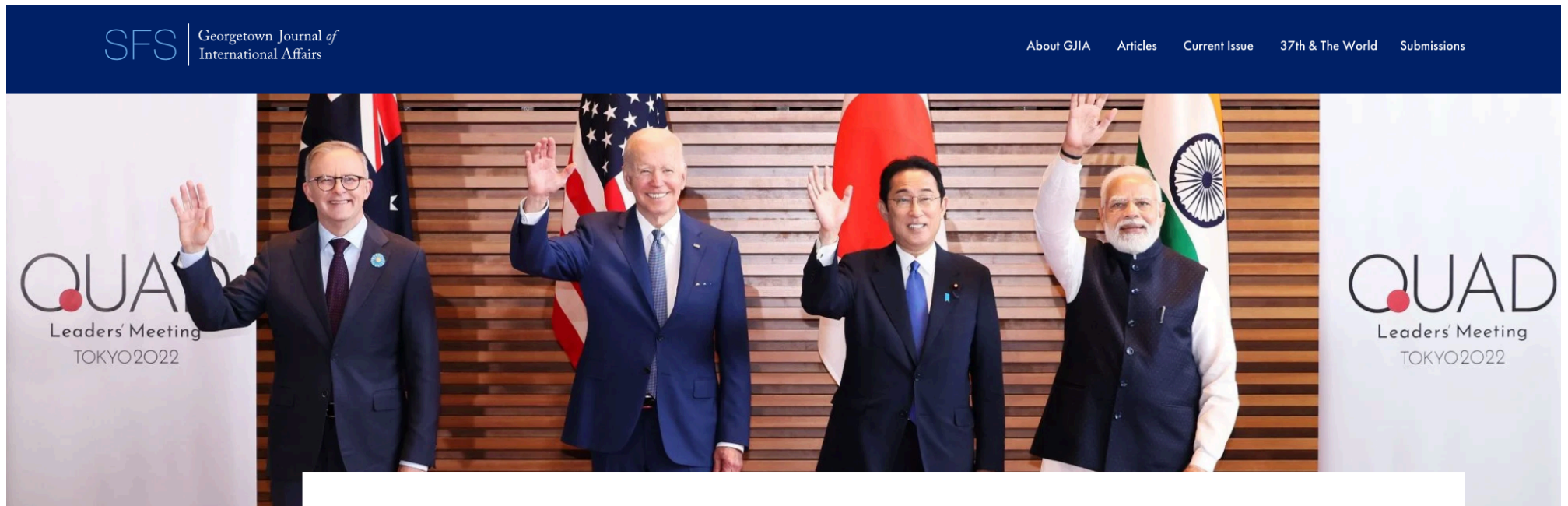
Indian Arms Imports by Country, 1992-2021



SOURCE: SIPRI Arms Transfer Database, accessed July 27, 2022.

A estratégia de ascensão da Índia: entre a economia e a política (18)

[FONTE: Georgetown Journal of International Affairs, 1/5/2023]



Conflict & Security

Engagement, not Entanglement: India's Relationship with the Quad

Aditi Malhotra

May 1, 2023



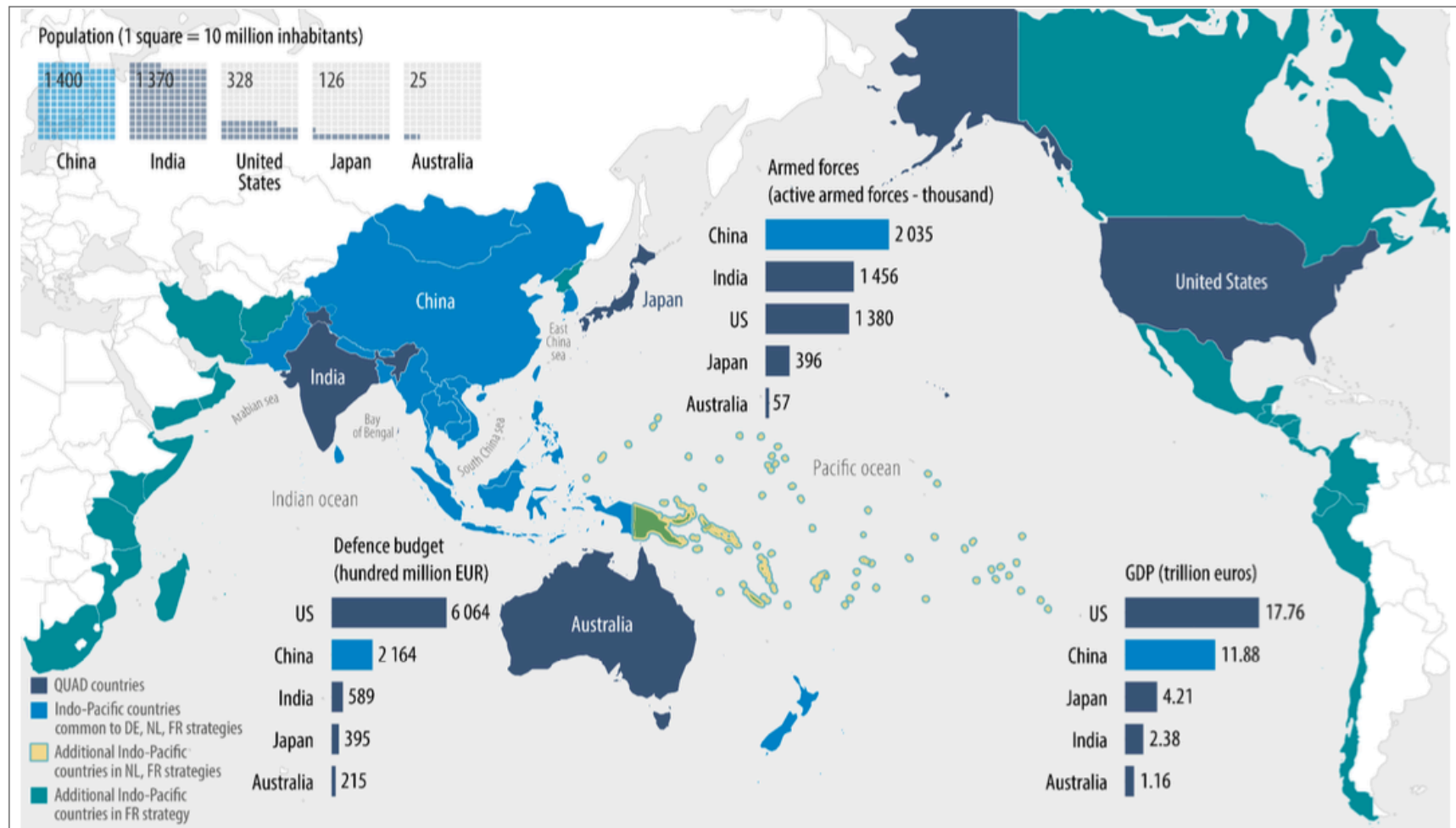
A estratégia de ascensão da Índia: entre a economia e a política (19)

[FONTE: EPRS | European Parliamentary

Research Service, 2021]

The Quad: An emerging multilateral security framework of democracies in the Indo-Pacific region

Map 1 – The Indo-Pacific, as defined in strategies from France, Germany and the Netherlands



Source: EPRS. Population, GDP and defence budget: 2019. Armed forces: 2020. NB: Representation of boundaries does not imply recognition.

A estratégia de ascensão da Índia: entre a economia e a política (20) [FONTE: Nicolas Blarel / Time, 17/11/2023]

How India Became Pro-Israel

5 MINUTE READ



This picture taken on July 28, 2019 in Tel Aviv shows two giant Israeli Likud Party election banners hanging from a building showing Israeli Prime Minister Benjamin Netanyahu shaking hands with Indian Prime Minister Narendra Modi. Jack Guez—AFP via Getty Images



BY **NICOLAS BLAREL** NOVEMBER 17, 2023 1:00 AM EST

Nicolas Blarel is an associate professor at Leiden University in the Netherlands, and the author of "The Evolution of India's Israel Policy."

A estratégia de ascensão da Índia: entre a economia e a política (21) [FONTE: Nicolas Blarel / Time, 17/11/2023]

It was not until 1992 that India [granted full diplomatic recognition](#) to Israel, including the opening of the Israeli Embassy in New Delhi. With the Cold War over and the impending Oslo Accords—which sought rapprochement between Israel and the Palestinians—India chose to end its policy of keeping Israel at a calculated distance. Since then, the Indo-Israeli relationship has developed steadily, especially when it comes to defense cooperation. A turning point came in 1999 when India went to war with Pakistan over the disputed Kashmir region and Israel demonstrated its willingness to provide arms and ammunition. In recent years, India has purchased about [\\$2 billion](#) worth of weapons annually from Israel. India has bought missiles, drones, bombs, and border-security equipment, and is now the Israeli defense industry's biggest foreign customer.

Modi's election in 2014 put the Indo-Israeli rapprochement into higher gear. While previous governments had made sure to keep their dealings with Israel largely silent, the Modi government has been public in its engagement with Israel. Modi was the first Indian Prime Minister [to visit](#) Israel in 2017, which was reciprocated when Netanyahu [traveled to Delhi](#) in 2018. The ideological alignment between the two right-wing leaders has certainly been more apparent than with previous governments. Members of Modi's Hindu nationalist Bharatiya Janata Party have long regarded Israel as a model religious-nationalist state to potentially build on, in contrast to India's founding as a secular and multi-religious one.

A estratégia de ascensão da Índia: entre a economia e a política (22)

[FONTE: Berkeley Political Review,

20/07/2022]



Sugestões de leitura

