High Tech Geopolitics

Trends & Assessments

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The Big Picture

Technology will likely feature as **a means** and **an end** of geopolitical contestation this decade. The securitisation of tech will increase before countries realise its limits.

Trade wars are largely tech competitions

- The emphasis on the importance of high-technology to national power means that governments are willing to incur the costs of high-technology decoupling.
- Practice of tech geopolitics precedes its theory.
- **Tech decoupling might happen at the level of materials, machines, humans, and values**. The precise pathway will be technology-specific.

Aggressive national competition over high-technology might produce some non-linear breakthroughs this decade

- When a nation-state enjoys a state of creative insecurity, its rate of innovation will tend to accelerate. (Taylor 2016)
- Observe Denmark vs Sweden
- Synthetic Rubber, DeepSeek, etc.

There is likely to be higher alignment between private high-technology players and their national governments

- Some companies will hedge, most others will comply.
- Intel's stance, Bricked stolen tractors in Ukraine
- Domestic Technology Industrial Policies

We will likely encounter selective international cooperation on high-technology subject to geopolitical considerations

- iCET, TRUST, AUKUS, Quad, Mineral Security Partnership

Defragmentation costs will be significant

- Additional capacity due to geopolitics will create 10% inefficiency in total wafer capacity by 2030 (ASML, 2022)
- Costs of fragmentation will be significant, especially on developing countries
- "A very serious decoupling scenario could cost up to 7 percent of global GDP" (Gita Gopinath, deputy managing director, IMF)

New Tech is the same as Old Tech. No, they are fundamentally different

Cellphones, Advanced chips, AI.

Space powers don't always become chip powers. Some domains are technically complex but operationally simpler. For space and nuclear sectors:

- Small output demand
- Manageable capital outlay
- Shorter supply chains that can be indigenised substantially

Tech Sovereignty is Paramount. No, Tech Power Matters.

- Sovereignty/Self-sufficiency (*Atmanirbhar*) vs Self-strength (*Atmashakti*)
- Think Tech Power: the ability to get the tech you want when you need it and to deny someone else from having that tech when they need it
- Alternate visions:
  - building base capabilities (open source, fab),
  - innovation policy (talent and R&D), and
  - asymmetric dependence.

Technology dependence implies strategic vulnerability. Not necessarily.

The case of Gallium & Germanium vs US export controls is not comparable. Think about:

- Substitutability,
- Supply chain dominance, and
- Acquired capability/technological gap

The case of rare earth magnets is instructive.

China has the upper hand. No, its tech stack is vulnerable to external shocks

Linear projection models don't account for:

- the FDI-led technology transfer party is over
- US still remains a vibrant destination attracting the best tech talent from across the world
- Diffusion rates are lower (Ding, 2024)
- Digital exports face a perception issue (TikTok in Taiwan)

A Framework for Tech Geopolitics

Assumed Impact on National Power	Strategic Objective	Instruments Used	Underrated Repercussions
Technology X underlies other critical & emerging tech	Denial	Secondary Sanctions	Difficult to sustain; incentives for backroom deals with adversary
		restrictions on movement of high-tech labour	Can slow down technical progress
		Export controls, End-use restrictions	Encourages adversary to build local capacity in a focused manner
		Investment restrictions	Can slow down technical progress
	Outpace adversary	industrial espionage to steal secrets, targeted poaching	Invites stricter controls on professionals from the stealing country
		Build partnerships for resilience	Self-sufficiency is a myth.
		Indigenisation and industrial policy	Difficult to sustain.
		Sabotage	Self-damage
		Increase dependence and control	Helps manage the adversary's pace to an extent
	Remove major bottlenecks	Promote Open Source	Still a nascent field
		Build partnerships	Self-sufficiency is a myth.
Technology X can have direct cognitive effects	Influence minds and actions	Espionage	Limited impact on national power
		Decouple information flows	
		Disinformation	

Figure 1: Source: Author

The Rise of "Bipolar Corporations"

Figure 8.3 Enterprise-Level Business Capabilities Versus Geotech Statecraft

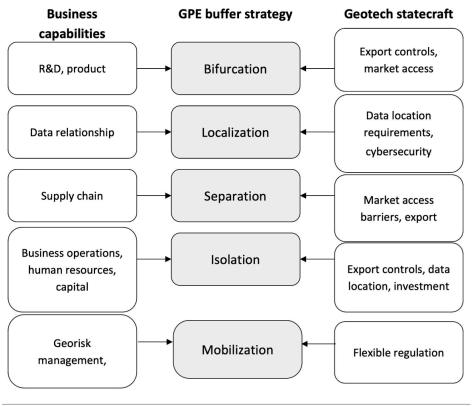


Figure 2: Source: Tech Cold War, Baums and Butts

Trends

1. India has its own complementary strengths in this domain. The foreign policy outlook on tech is not defensive
2. Likelihood of technology transfer/upgradation is higher than during the Cold War
3. Human Capital is India's potential strength
4. Plurilateral cooperation is a necessity and not a choice
5. Excessive focus on base capabilities and not on asymmetric strategies

A Techno-Strategic Doctrine for India (Takshashila, 2022) I

Preamble

1. Technology is crucial for India's development in the Information Age. It is also an important element of national power. The acquisition of advanced technologies is not an end in itself but a means to bring peace and prosperity to all Indian citizens.
2. India seeks a global environment where technology is accessible to humanity. It will also promote a global order where technology strengthens the values enshrined in the Indian Constitution and the UN Charter.
3. India shall strive for effective technology governance that can contribute to all aspects of human development.

A Techno-Strategic Doctrine for India (Takshashila, 2022) II

4. India must be prepared for cooperation, competition, and conflict in the areas of knowledge creation, human capital, influence, raw materials, and norms.

Objectives

1. To establish India as a major power in international affairs.
2. To invest in the development of advanced scientific and technological capabilities in the public, private, and social sectors.
3. To harness India's capabilities in the technology domain to achieve national goals.
4. To promote sustainability by using technology.
5. To ensure that technology empowers citizens and safeguards constitutional rights.

A Techno-Strategic Doctrine for India (Takshashila, 2022) III

Approaches

1. Since human capital is India's biggest strength, it will strive to maintain the largest talent pool in every technological sector.
2. India will advocate the free movement of people, knowledge, and capital across national boundaries.
3. India will adopt governance frameworks that enable research and development, early deployment, and adoption of technological innovation.
4. In order to protect its strategic autonomy in the technological domain, India will champion open technologies.
5. India will possess top-tier capabilities for information warfare.

A Techno-Strategic Doctrine for India (Takshashila, 2022) IV

6. Governments, private corporations, civil society, academia, and individuals will work in tandem according to their comparative strengths.
7. India will be a vital node in the global technology ecosystem and build strong links with states that share its interests and values and with which it enjoys economic complementarities.
8. India will pursue international cooperation to widen its access to technologies, raw materials, and human resources.
9. India will promote technological innovation to address sustainability challenges.
10. India will adopt a robust legal framework and enforcement mechanism that protects citizens' data, privacy, cybersecurity, and cognitive autonomy.

India's Techno-strategic stance on China

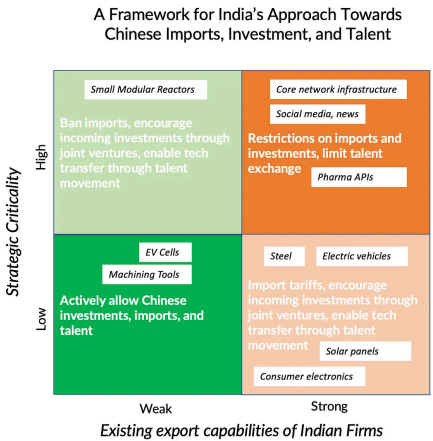
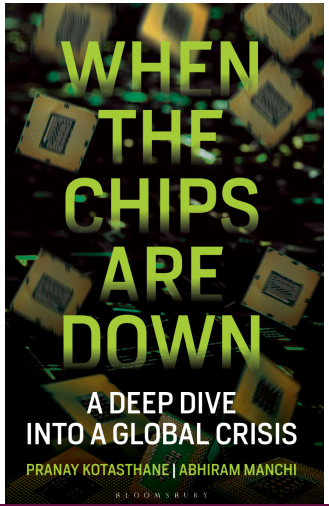


Figure 3: Source: Author

Things to Remember

- States have internalised the importance of technological developments
- Not all tech dependences are strategic vulnerabilities
- Tech Wars are Tech Competitions
- Think strengths not self-sufficiency
- There are many misconceptions in this domain



References and Further Reading

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