Consider This

Weaponising AI supply chains

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> **"After enduring a prolonged and unprecedented series of shocks, the global economy appeared to have stabilised, with steady yet underwhelming growth rates. However, the landscape has changed as governments around the world reorder policy priorities and uncertainties have climbed to new highs. Forecasts for global growth have been revised markedly down compared with the January 2025 World Economic Outlook (WEO) Update, reflecting effective tariff rates at levels not seen in a century and a highly unpredictable environment."**
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> IMF, World Economic Outlook, 14 April 2025

For decades, global supply chains have driven efficiency and resilience in global trade, benefiting consumers by providing a variety of products at affordable prices. Companies leveraged logistics, capital mobility and trade liberalisation to reduce costs and build economies of scale. However, recent crises like COVID-19, geopolitical conflicts and trade weaponisation have revealed vulnerabilities and dependencies in key sectors.

Policymakers now focus on safeguarding critical supply chains, reducing high-risk dependencies and boosting resilience against external shocks. This shift aims to ensure long-term economic stability and competitiveness in an uncertain global environment.

The physical architecture of supply chains must change, not just to lock in future supplies of raw materials, but also to safeguard the physical and digital integrity of every step of the supply chain, in the name of national security. It seems obvious that foreign direct investment (FDI) will suffer, weakening global capital expenditure.

All these considerations are driving debates in boardrooms and investment companies around the world, with the recognition that prevailing country risk premiums will have to change, along with the mechanisms to determine them, because they do not adequately reflect the outlook.

Franklin Templeton Institute offers five topic papers covering five global supply chains, applying fundamental research with an eye to identifying sources of risk and opportunity in each:

Investors must develop a deep understanding of industry-specific supply chains to be able to pick the winners and avoid the losers in the next decade. It is not just about the country of origin. In a world where everything can be weaponised, the traditional measures of valuation and risk no longer apply.

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Global supply chains face structural challenges

Global supply chains are being recalibrated to erode efficiency and profitability in the name of compliance with geoeconomic policy imperatives. In a world where everything has the potential to be weaponised, companies need to have customs and policy information in real time to inform business decisions around the deployment of capital, and investment returns are highly dependent on these decisions.

The AI supply chain is not secure

AI requires access to highly skilled engineers, significant capital and, of course, enormous volumes of data. But even AI requires nuts and bolts. The software is run in data centres, which consist of tens of thousands of component parts that represent a highly complex spider's web of supply chains that range across many countries around the globe, all of them subject to tariffs or obstacles to trade in the new world.

Chips are just the most visible vulnerability

Naturally, the key parts are the advanced semiconductors, which do the heavy processing. These are already intricately snarled in the geoeconomic webs that drive direct and indirect barriers to trade. Selling the machines that make the chips, as well as the materials used to make them, is subject to licence and sanction. Antimony, gallium, germanium and indium are some of the primary critical minerals used to create compound semiconductors. Some of the main challenges in their production are the cost of raw materials and the complexity of the fabrication process, but the main issue is the uncertain access to critical minerals, as we explore further in that paper.

Data centres need energy

Moving more and more transactions, records and business to the cloud demands an increase in electricity to power this transition. Data centres and AI applications are also held up as drivers of additional electricity demand growth. Their tendency to concentrate geographically puts a significant strain on local resources,[1] and so far, the rate of technical efficiency improvements has been relatively slow. In large economies like the United States and Europe, data centres account for 2%–4% of total electricity consumption.

Going forward, data centres are widely expected to account for 10%[2] of global electricity demand growth in the next five years. Their relevance, however, is likely to be pronounced only in certain geographies with high concentrations and consequent pressures on the local grid. Northern Virginia is the largest data centre market in the world (13% of global capacity and 25% of capacity in the Americas). It has 352 data centres consuming four gigawatts (GW), likely to rise to 11 GW by 2030, equivalent to 40% of the state's power generation capacity. The European Union (EU) has 1,830[3] data centres, around 15% of the world's total, and a third of these are in Germany. Please see our previous paper on this topic: Consider This: Could Europe build a structural advantage via cheap electricity?

The importance of US geography (and protectionism)

On an overall basis, the United States has enough baseload (continuous) power generation to cope with this growing demand. However, it is not available in the right places. The biggest surplus of power generation is in Texas and North Dakota. However, the data centres are concentrated in California and in northern Virginia, where they can be close to the landing sites of the undersea cables that carry data around the world. The Jones Act also gets in the way. This federal law, passed in 1920, limits how cargo can be transported by sea. It stipulates that any cargo shipped between US ports must be carried by US-built, US-owned and US-operated ships, with American crews. It was originally intended to support the strategically important shipping industry, but it has had unintended negative consequences. Natural gas fuels 55%[4] of Virginia's electricity generation, yet the state utility cannot simply buy liquified natural gas (LNG) from Texas, because the United States has no LNG tankers and cannot contract a South Korean or Japanese vessel to ship it to Virginia because of the Jones Act, making the cost prohibitively expensive. We explore this further in our chapter on weaponising shipping.

Data centre design is important

Data centres are particularly vulnerable due to the extensive range of subcomponents sourced from numerous countries. This makes them susceptible to supply shortages, especially considering the ongoing weaponisation of trade. The risk of a domino effect causing successive bottlenecks across the entire supply chain is inherently high. And the complexity of tangled commercial relationships makes the challenge of an urgent recalibration to accommodate geoeconomic pressures virtually impossible.

The highly sophisticated, high-density chips required for AI workloads function 24 hours per day and generate significant heat. This means they need sophisticated heat, ventilation and air conditioning (HVAC) systems, which also provide air quality and humidity control. The heating and ventilation systems are separate from the air conditioning, but they must operate in tandem to optimise performance. Conclusion? It is prohibitively expensive and technically challenging to retrofit existing data centres. They tend to be new builds designed for purpose.

> **"As investors, we consider AI to be a seismic thematic shift, and so it represents an important focal point for us. We capture this within our portfolios through our geopolitical and technological fragmentation theme. We expect this fragmentation to continue to accelerate, impacting a range of sectors within the AI ecosystem, most notably the semiconductor industry."**
>
> **Zehrid Osmani,** Head of Global Long-Term Unconstrained
> Franklin Equity Group

Undersea cables: Old fashioned, efficient but vulnerable

Undersea cables, although largely out of sight and until recently, out of mind, serve as the primary conduit for global data flow. These cables are particularly susceptible to geopolitical tensions. Spanning 1.3 million kilometres with 1,636 cable landing stations,[5] they facilitate the transmission of US$10 trillion[6] in daily financial transactions, private and commercial communications, and critical national security information. These cables, which can be as thin as human hair and reach depths of up to 8,000 metres, are integral to our digital infrastructure and the AI value chain. Ownership of these cables predominantly lies with private sector companies, including telecommunications and technology firms. Notably, northern Virginia hosts a high concentration of data centres due to its proximity to the landing points of numerous transatlantic undersea cables.

Despite significant technological advancements over the decades, undersea cables have remained largely unchanged since their inception in 1850.[7] The primary reason for this is speed. While satellite data transmission records around 200 gigabits per second, undersea cables are at least five times faster, exceeding 200 terabits per second. However, these cables are prone to breaks, with approximately 150 incidents occurring annually due to aging, accidents or geopolitical conflicts. Recent incidents include cable breaks caused by Chinese and Russian vessels in the Baltic Sea and the Taiwan Straits.[8] Repairing these cables is both costly and complicated, especially in disputed waters. Currently, both the United States and China have complete value chains for undersea cables. The world relies on a fleet of only 46 cable repair ships,[9] 30 of which belong to NATO members. In a world where everything is potentially weaponised, the US State Department10 has advised communications providers of their suspicions that certain cable repair ships could pose security risks. State Department[10] officials have noted that a state-controlled Chinese company, S.B. Submarine Systems, which assists in repairing international cables, appears to be concealing its vessels' locations from radio and satellite tracking services, raising concerns.

Conclusion

While investors debate the implications for valuations of AI-related firms, the real-world risks of physical disruption loom. While semiconductors are a significant component of the AI supply chain, the broader implications of tariffs on related goods, such as electronics and data centre components that incorporate semiconductors, are also relevant. The inescapable conclusion is that tariffs can have indirect effects that lead to supply chain shortages for AI.

The vulnerability of the AI-supply chain to physical disruption is particularly concerning around undersea cables, where old technology maintains its central importance yet is unable to address its security weakness. In a world of weaponisation of supply chains, we believe this weakness is not prioritised as it should be.

Investors should be clear that the physical supply chain of AI cannot be taken for granted and should be considered a major risk factor, with knock-on effects on a wide variety of industrial supply chains.

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Endnotes

1. Source: Power Engineering. 20 December 2024.
2. Source: "Global electricity demand: What's driving growth, and why it matters." The Oxford Institute for Energy Studies. January 2025.
3. Source: Fleck, Anna. "Which Countries Have The Most Data Centers?" Statista.com. 20 September 2024. The author calculated the amount for European data centres using information in this article quoted from Cloudscene platform data as of March 2024.
4. Source: "Virginia State Profile and Energy Estimates." US Energy Information Agency. Accessed 20 April 2025.
5. Source: "To Secure Undersea Cables, Take Lessons from the British Empire's All-Red Line." US Naval Institute, Proceedings, Vol. 150/7/1,457. July 2024.
6. Source: theverge.com. 16 April 2024.
7. Brett's Submarine Telegraph Company laid the first ocean cable in 1850 across the English Channel.
8. Severing Taiwan's cables is considered the first step of a Chinese war plan to besiege or invade the island.
9. Source: "Cableships of the World." International Cable Protection Committee (ICPC). 27 March 2025. Note: Only three Chinese ships appear on this register, which seems unlikely to be a true picture.
10. Source: "US Warns Telcos That Chinese-British Submarine Cable Repair Ships Are a Security Risk." commsrisk.com. 14 June 2024.

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