Chris Miller. *Chip War: The Fight for the World's Most Critical Technology*. New York: Scribner, 2022. 978-1398504097

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Chris Miller's Chip War: The Fight for the World's Most Critical Technology argues that control over semiconductors now shapes economic strength and military power. He follows the semiconductor supply chain from U.S. design software and Nvidia's leading AI chips, to a single Dutch supplier of extreme-ultraviolet tools, and to Taiwan's semiconductor fabrication plants (fabs) that produce most leading-edge logic chips. The book highlights the immense capital required to compete in this critical technology—a state-of-the-art plant can cost over $20 billion—and the critical role of government policy. As Miller illustrates, export controls, China's massive subsidies, and U.S. alliances with Japan, South Korea, the Netherlands, and Taiwan are just as important to the industry as technical expertise or economic might. He connects the industry's booms and busts to today's race for AI, 5G, and smart weapons, providing a clear, concrete map of the chokepoints, players, and high stakes that define the 21st century.

The following review highlights the book's key arguments, strengths, and areas for further exploration. As an associate professor of international history at Tufts University's Fletcher School, Miller presents a concise, historically grounded account of semiconductor supply chains and the current competition between the United States and China. Chip War offers a clear analysis of the link between technology and international politics, providing practical insights for scholars, policymakers, and general readers. The book's success, winning the 2022 Financial Times Business Book of the Year and becoming a New York Times bestseller, signals its broad appeal beyond tech circles.

The Semiconductor's Global Journey

Miller begins by chronicling the rise of the semiconductor industry from its Cold War origins in Silicon Valley to its current global ubiquity. Early breakthroughs by U.S. companies like Intel and Texas Instruments laid the groundwork for a technological revolution. Later, military contracts spurred further innovation, embedding semiconductors at the heart of computing, communication, and national defence.[1]

As chip technology evolved, so did its production. Miller explains how Japan, South Korea, and Taiwan emerged as dominant players by the late 20th century, challenging U.S. leadership. Today, Taiwan Semiconductor Manufacturing Company (TSMC) produces more than half of the world's advanced chips, underscoring Taiwan's central role in global supply chains.[2] Yet, this concentration creates vulnerabilities. A conflict involving Taiwan, especially with China, could disrupt semiconductor production, destabilising economies worldwide.[3]

Miller excels in making concepts like Moore's Law tangible, taking the reader inside the manufacturing process. He describes engineers meticulously aligning mirrors inside a bus-sized extreme ultraviolet (EUV) lithography machine, where a laser strikes a stream of tin droplets to create short-wavelength light necessary to etch features measured in mere nanometres. He pairs the physics of this process with the economic realities of modern semiconductor fabrication. A top-tier fab now costs more than an aircraft carrier, draws on thousands of suppliers, and run on thin margins, where a single percentage point can decide a company's profits and market leadership. This economic reality directly influences national policy, from U.S. subsidies to Dutch export rules and Taiwan's manufacturing focus. The narrative unfolds like a relay race, moving from lab to factory and into government cabinet rooms, all driven by the same pressure to increase transistor counts.

Semiconductors and the U.S.-China Rivalry

Miller argues that semiconductors are a central battleground in the U.S.–China contest for power. Chips are more than mere commodities; they are strategic assets, making fabs, tools, and design a matter of national security. China's reliance on foreign lithography, electronic design automation (EDA) software, and leading-node processors becomes a key pressure point as leaders push for technological dominance.[4]

In response, Beijing has invested billions of U.S. dollars into its domestic semiconductor industry, aiming for self-sufficiency. However, Miller notes that China faces steep hurdles: it lacks the sophisticated equipment and expertise needed for producing cutting-edge chips.[5] Another major vulnerability for China is chip design software. Miller introduces EDA as the essential toolchain for drawing and verifying transistor layouts at the nanometre scale; without it, it's impossible to produce modern chips. Three firms—Synopsys, Cadence, and Siemens—dominate the EDA market, giving their home countries outsized control over who can design and build advanced processors.

Miller shows a two-track U.S. strategy to hold the lead. One track funds capacity and research at home. The CHIPS Act of 2022 puts $52 billion into domestic fabs, labs, and the workforce, with guardrails blocking subsidised firms from expanding advanced lines in China. The other track involves China's progress by controlling access to key tools. For example, the Netherlands-based ASML holds a global monopoly on EUV lithography machines, which use 13.5-nanometer light to print the smallest features on a chip. The United States has coordinated with the Dutch government to restrict EUV machine export to keep leading-edge nodes out of competitors' reach.[6] Moreover, Washington coordinates with allies to target Chinese firms like Huawei, cutting off their access to leading-edge chips, EDA software, and other advanced tools. Both tracks serve

one goal: secure supply chains and stay a step ahead in design and production.[7]

This rivalry looks like a new arms race, with chips instead of missiles. Miller connects the fight over lithography, fabs, and design to alliances, trade rules, and military planning. Export controls bind the United States to partners in the Netherlands and Japan, while concerns over Taiwan's fabs shape strategy and logistics. As today's defence doctrines are increasingly centred around precision weapons and AI powered by advanced semiconductors, Miller argues, "[t]he rivalry between the United States and China may well be determined by computing power."

Economic and Security Risks

Beyond geopolitics, Miller details the economic and security risks of semiconductor dependency. Since chips power consumer tech and advanced defense systems, dependency becomes a strategic liability. Nations that control production also control access to military advantage and innovation across many sectors of the economy.[8] This logic is driving policy choices on both sides of the Pacific.

The COVID-19 pandemic then stress-tested this system. Shortages from 2020 onward stalled assembly lines for everything from automobiles to medical devices and electronics. These cascading delays exposed fragile links in global logistics and supplier networks: because leading-edge fabrication is clustered in East Asia, regional instability in Taiwan, South Korea, or coastal China could have sweeping global consequences.[9] In response, the United States, Europe, and Japan are funding new fabs and research hubs. Diversification, however, requires large capital, skilled labor, and time.[10] Until new capacity arrives, supply remains vulnerable to shocks from natural disasters, trade disputes, or conflict.

Conclusion: A Call to Action

Chris Miller's Chip War is a sharp and urgent analysis of the semiconductor industry's role in shaping global power. By examining the history and geopolitics of chips, Miller illuminates why they are not just technological components but strategic resources that define economic and military strength. As the U.S. and its allies work to secure their supply chains and China pushes for self-reliance, the stakes of this competition continue to rise. Miller's work offers crucial insights into how this race will shape international relations and the global economy.

More importantly, the book is not merely an account of the past or present. It is a call to recognise the fragility of the systems we rely on and to act decisively to mitigate risks. In doing so, Chip War challenges readers to confront the far-reaching implications of the world's dependency on semiconductors—and to consider what must change to secure a more stable and resilient future.

Despite its compelling illustration of semiconductors' geopolitical importance, the book leaves some areas underexplored. While Miller thoroughly examines the U.S. and China, he devotes less attention to other rising players, such as the European Union (EU) and India, which are increasingly investing in semiconductor production and could shape the industry's future.[11] He also briefly mentions the environmental costs

of chip production, but does not fully address the implications of its energy-intensive nature—a dimension that deserves greater analysis given with global concerns about climate change.