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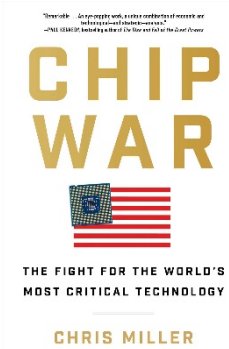
Jackson Square Book Talks

Chris Miller: Chip War

A Commonwealth Club Presentation sponsored by Jackson Square Partners

Semiconductors are the world's most critical technology and production of leading-edge chips takes place in a highly interdependent system of oligopolies and monopolies.



COMMONWEALTH CLUB

Chris Miller
Author; Associate Professor of International History, Tufts University

In Conversation with

Niall Ferguson
Milbank Family Senior Fellow, Stanford University; Senior Faculty Fellow, Harvard University

[Listen to the replay from 10/17/22]

OUR KEY TAKEAWAYS

A closed loop system

- Complexity and cost of each stage of production, from design to fabrication, creates a strong moat, with even nationally-backed companies struggling (and failing) to catch the market leaders
- Most advanced chips are designed in the U.S., fabricated in Taiwan at TSMC, via machinery supplied by ASML in the Netherlands
  - TSMC builds almost all of the most advanced processor chips, fabricating 37% of the world's new computing power at its Taiwan factory
  - Two Korean companies produce 44% of the world's memory chips
  - Oligopoly of companies in the US and Japan make irreplaceable machinery for production
  - ASML builds 100% of the world's extreme ultraviolet lithography (EUV) machines which are used in chip fabrication, $150 million each
- EUV machines are so precise that they are "like hitting a coin on earth from the moon with a laser"
- [See Chris Miller describing EUV technology]

China and the Chips Act

- Chips are an avenue for the U.S. to retain its technological military advantage over China and the Chips Act hopes to widen it further
  - Essentially "weaponized interdependence"
  - Bans sale of the most advanced chips or tools for producing such chips to Chinese companies
  - Prohibits U.S. nationals from supporting the development of this technology in China, forcing employees of Chinese companies to choose between their job and their U.S. citizenship
- China consumes 40% of semiconductors manufactured globally and spends more on chips than oil
- China retains the ability to manufacture lower-end chips, which are cheaper and sufficient for IoT devices and other basic consumer electronics
- The "Chip War" is emblematic of growing trade, economic and military tensions between the US and China, with Taiwan caught in the middle
- Building more resilience into the global chip supply chains will be expensive and take years