

Back & Forth 2: Intel and the Semiconductor Industry



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solutions to our biggest challenges on economic security and technology. That, in our opinion, is the crying need of democratic governance in polarized times.

– Navin Girishankar, President, Economic Security and Technology Department, CSIS

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Intel's Strategic Importance as a U.S. National Champion

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Recent trends, driven by major industrial policies of other countries, have eroded U.S. leadership in advanced semiconductor manufacturing. The United States has also seen an erosion of onshore chipmaking, which now accounts for only about 10 percent of global capacity. Meanwhile, China—the United States' most formidable strategic competitor—is making rapid strides in semiconductor manufacturing, particularly in defense-related sectors, fueled by massive public subsidies.

In this context, the United States needs to build on its assets to secure the future of this strategically valuable industry. While we rightly celebrate U.S. leadership in designing chips, we must also recognize the significant value to the nation embedded in Intel Corporation's deep network of knowledge, resources, and relationships that underpin its ability to produce extremely complex and sensitive technologies that are key to many aspects of the U.S. economy and, not least, national defense. This complex network with a capable U.S. firm at its core took many years to grow and is of major strategic value. Especially given its scale, Intel plays a key role in sustaining the industrial commons that anchor the activities of other semiconductor companies in the United States. Notwithstanding its current challenges, Intel cannot be left unsupported—particularly in today's fraught geopolitical landscape—as a much-

diminished Intel would have major negative consequences for U.S. economic and national security.

The government recognizes Intel's strategic importance in the current global competition. Recently, the Department of Commerce awarded Intel Corporation up to \$7.9 billion in direct funding. To date, this is the largest share of federal support under the CHIPS Act, although less proportionally compared to the level of its domestic investments. Crucially, though it currently lags behind Taiwan Semiconductor Manufacturing Company and Samsung in chip process technology, Intel is the only U.S.-headquartered firm within striking distance of regaining U.S. capabilities at advanced process nodes. The company has made massive commitments to invest heavily—more than \$100 billion by the end of the decade—in new chipmaking capability and capacity on domestic soil, aiming to develop and manufacture chips at the most advanced process nodes of two nanometers and below.

Intel is thus critical to achieving the CHIPS Act's economic and strategic goals, it is vital that the company remains viable and capable of carrying out its commitments—with even more public support, if necessary, than it has already been promised. The CHIPS Office at the Department of Commerce must show flexibility to ensure that these national priorities are supported. The United States' competitors recognize the strategic value of their own champions and have undertaken major efforts to support these assets when deemed necessary, thereby shaping the competitive environment for U.S. firms.

Intel's Strategic Importance to the CHIPS Act

While recent accounts of Intel's difficulties and leadership changes have been widely reported, the company's future has broad national and global significance far beyond its employees and shareholders. Intel is a critical player in the U.S. government's efforts to reduce dependency on chips manufactured abroad—notably the massive concentration of production in Taiwan—and regain parity if not leadership in semiconductor manufacturing technology. Both capability and capacity are needed to provide an alternative source for the most advanced chips. If Intel's restructuring efforts fail, current U.S. efforts are unlikely to achieve their objectives, with significant ramifications for U.S. national security and economic future.

As argued by Geoff Colvin in *Fortune*, Intel is no longer just a conventional company—it’s a “corporate actor on the geopolitical stage.” Policymakers must recognize Intel’s national security importance within this decade’s dramatically changed geopolitical environment. No other large chip manufacturer is investing anywhere close to the scale of Intel’s projects in the United States over the same time frame. These plans necessarily require very high levels of capital expenditure, with payoffs only coming in the medium-to-long term, a major source of Intel’s current challenges.

If Intel were to bow out of CHIPS Act initiatives, the act’s successful and timely implementation would be seriously jeopardized. The stakes are high, including for national defense; as writer Mackenzie Hawkins recently pointed out in *Bloomberg*, “Intel’s woes may . . . jeopardize the government’s ability to reach its policy goals, which include establishing a secure supply of cutting-edge chips for the Pentagon and making a fifth of the world’s advanced processors by 2030.” Finding a U.S.-headquartered replacement to maintain domestic ownership of Intel’s higher-end fabs or to preserve its technological know-how would be nearly impossible.

Foreign Support in the Semiconductor Industry

The cyclical nature of the semiconductor industry means it must make substantial investments to maintain and improve production capacity during economic downturns for the eventual recovery and growth in demand. Semiconductor companies require significant capital to maintain and enhance their production capacity. As Intel’s founder Gordon Moore once remarked, “You can’t get better with old technology.” To address these high capital needs of the industry, leading manufacturers abroad receive both direct and indirect government support, frequently on a massive scale. This is true across allies and competitors. Government support combined with enormous competence at TSMC has led to the world’s current dependency on Taiwan for the manufacture of the most advanced chips. The United States should recognize this reality and provide substantial, if temporary support to reduce dependency for this critical technology in a country facing unique geopolitical challenges and potential geological risks as well.

Move Now

Successful and timely implementation of the CHIPS Act is a critical step to address the China challenge. Meeting the Chip Act's goals cannot and will not happen without Intel. The United States should understand that Intel is not and will not be competing on the mythical level playing field. Implementing an array of supportive measures beyond the CHIPS Act would be a powerful way to underscore that the government wants Intel, and the U.S. semiconductor industry, to thrive and grow for decades to come.

Full report here: [Too Good to Lose: America's Stake in Intel](#) (November 12, 2024)

Rethinking the U.S. Semiconductor Strategy: A Case for Diversification

Christina Alfonso, President, Council on Global Competition and Innovation

The article, "Intel's Strategic Importance as a U.S. National Champion," by Sujai Shivakumar and Charles Wessner makes a compelling case for supporting Intel as a national champion in the U.S. semiconductor industry, particularly in light of the 2022 CHIPS Act. This legislation, designed to bolster domestic semiconductor manufacturing and research, has allocated significant funding to key players like Intel. While their arguments highlight important considerations, it is crucial to examine alternative perspectives that could lead to a more robust and resilient semiconductor ecosystem in the United States.

The Risks of Overreliance

Placing too much emphasis on a single company, even one as historically significant as Intel, carries inherent risks. An overreliance on Intel could potentially create a monopolistic situation, stifling competition and innovation within the U.S. semiconductor industry. Moreover, if Intel fails to deliver on its promises, the entire U.S. strategy, including the objectives of the CHIPS Act, could be jeopardized, leaving the country vulnerable in a critical technology sector.

The authors also failed to address Intel's current financial woes and the impact of subsidies, including whether government funding might contribute to inefficiencies and strategic missteps. This raises an important question: Is relying on firm-level subsidies for a single company the most effective use of taxpayer money?

Diversifying U.S. Semiconductor Capabilities

While Intel's historical importance is undeniable, recent years have seen other U.S.-based companies make significant strides in semiconductor technology. Advanced Micro Devices (AMD), for instance, has demonstrated superior efficiency and technological progress in several areas, often surpassing Intel's offerings. In the server processor market, AMD's EPYC 9755 128-core Turin processor has shown a 40 percent performance advantage over Intel's Xeon 6980P Granite Rapids server in a wide variety of server, technical computing, and high-performance computing workloads. This example showcases how AMD has managed to outpace Intel in certain key areas of the semiconductor industry.

GlobalFoundries, while no longer pursuing bleeding-edge nodes, maintains significant manufacturing capabilities on U.S. soil. Their continued production of chips for various applications, including automotive, Internet of Things, and communications, demonstrates the importance of diverse manufacturing capabilities.

Additionally, innovative startups like Celestial AI, Groq, and SiMa.ai are pushing the boundaries of AI chip design, potentially offering groundbreaking solutions if given proper support. For example, Celestial AI's development of their "Photonic Fabric" optical interconnect technology aims to address latency and bandwidth bottlenecks in AI computing, potentially revolutionizing high-performance computing and data center environments.

Allocating substantial taxpayer money to a single company facing challenges may not be the most effective strategy. Instead, distributing funding across multiple firms could stimulate competition and innovation while reducing risks associated with overconcentration.

Policy Trade-Offs: Firm-Level Subsidies vs. Tax Incentives

A critical policy question is whether firm-level subsidies are the optimal approach compared to broader tax incentives or research and development (R&D) funding. Firm-level subsidies risk fostering dependency or misalignment with market

dynamics, while tax incentives could encourage industry-wide growth without favoring specific players.

The CHIPS Act allocates \$39 billion toward manufacturing subsidies but only \$11 billion toward R&D initiatives through programs like the National Semiconductor Technology Center. Policymakers should consider whether this balance is appropriate. A stronger focus on R&D could position the United States as a leader in next-generation technologies while avoiding overinvestment in legacy manufacturing capabilities.

Investing in Future Technologies

Rather than solely focusing on catching up in traditional semiconductor manufacturing, the United States could prioritize emerging fields where U.S. companies have the potential to leapfrog current leaders. For example, investing in quantum computing could secure leadership in this transformative field, while neuromorphic chips, which mimic brain function, hold significant promise for AI applications. Similarly, advanced packaging techniques offer opportunities to improve performance without requiring cutting-edge node sizes. By directing more resources toward research and development in these emerging technologies, the United States can leverage its strengths in chip design and specialized processors while fostering long-term competitiveness in the global semiconductor industry.

Supply Chain Resilience

While domestic production is essential for national security, achieving supply chain resilience requires collaboration with allied nations. Recent efforts to partner with Japan, South Korea, and European countries demonstrate the potential of such an approach.

Rather than attempting to onshore the entire semiconductor manufacturing process, which may not be feasible or economically viable, the United States could focus on securing critical components and technologies through global partnerships. However, this strategy may require adopting a more trade-friendly agenda to ensure access to international expertise and resources.

The semiconductor industry is vital to U.S. national security and economic competitiveness. While Intel’s historical importance and current efforts should not be discounted, an overreliance on a single company risks undermining broader industry resilience. Policymakers must carefully weigh trade-offs between firm-level subsidies and broader investments in tax incentives or R&D funding.

By adopting a diversified approach—supporting multiple companies across different segments of the industry while fostering international partnerships—the United States can build a more competitive and resilient semiconductor ecosystem for decades to come. Supporting innovation at every level—from established giants like AMD and GlobalFoundries to promising startups like Celestial AI—will better position the United States as a global leader in this critical sector.

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