

LABS OVER FABs: HOW THE U.S. SHOULD INVEST IN THE FUTURE OF SEMICONDUCTORS

EXECUTIVE SUMMARY

The U.S. semiconductor industry faces an existential competitive threat. China's efforts to catch up and eventually overtake the U.S. in semiconductor technology is not only an economic challenge—it is also a security threat. The Trump administration's decision to pressure Huawei by cutting off its access to critical semiconductor technologies has only intensified China's commitment to developing its own ability to design and manufacture computer chips without reliance on foreigners. China has spent billions of dollars in state subsidies, and plans to spend billions more in the coming years. At risk is not just the U.S. industrial base, but also the complex supply chains that link U.S. firms to customers and suppliers in South Korea, Taiwan, Japan, and several European countries.

On February 24, 2021, President Biden ordered a 100-day review aimed at “securing America’s critical supply chains.” The executive order focused on the semiconductor industry, declaring that “over the years we have underinvested in production—hurting our innovative edge—while other countries have learned from our example and increased their investments in the industry.”

While production certainly has its place, it would be dangerous for the U.S. to focus solely on the fabrication of semiconductors at the expense of other parts of the chip

production process—including design, software, and production machinery—where the U.S. is currently stronger. There is a case to be made for supporting the construction of manufacturing facilities (“fabs”) for certain types of specialized chips, such as those needed in the defense sector. But reshoring most or all production is not a realistic goal. Moreover, the tens of billions of dollars that such a policy would cost are better spent elsewhere.

Beyond that, the U.S. should focus less on supporting production of today's technologies, which given the pace of innovation will soon be out of date. Instead, scarce resources should be devoted to shoring up the broader semiconductor ecosystem on which American innovation depends. In the past, the government has played a major role in investing in research that is not yet commercially viable, something it should be doing more of today. It should build talent pipelines from high schools to universities to corporations and startups, ensuring an ample supply of semiconductor engineers. And the U.S. should see open-source chip architectures such as RISC-V not as a threat to existing intellectual property, but as a technology that could unlock a new wave of semiconductor innovation—something that the U.S. would be well placed to lead.

