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Count the Costs of Cutting Technological Ties with China

Flexibility, not fear, will help the United States navigate the unpredictable consequences of technology—military, economic, political, and social.

National security thinking about technology is a mess. During the Cold War, America did everything it could to stop the Soviet Union from getting Western technology. Afterwards the United States mostly opened up, convinced that its values would spread hand-in-hand with its technology. This did not lead to the triumph of liberalism; it did produce a highly **integrated global technology economy**.

The last Trump administration—alarmed by China's success and the possible relative decline of America—started repurposing Cold War tools. The Biden administration deployed export controls, but not wholesale. It instead tried to erect a 'high fence' around a 'small yard' of foundational technologies by subjecting them to export restrictions, while separately plugging vulnerabilities in America's own supply chains.

Unless the new Trump administration opts for complete technological decoupling, it will face the same dilemma; Which technologies do you restrict, and which do you leave alone? This breaks down into three related problems.

First, national security officials have no good way to distinguish technologies that are foundational from those that are not. They have never really explained the criteria they use. In fairness, there aren't any obvious answers. To know whether a technology is foundational involves somehow predicting that it will one day create feedback loops that reinforce military, economic, political, or social advantages. Ten years ago, few could have guessed that statistical text prediction (an idea Claude Shannon came up with in the mid-20th century) and a neural net architecture called a "transformer" could be combined to create large language models like GPT-4.

Second, even if, in principle, some people can make good guesses about the trajectories of technological development, the United States has a hard time doing so in practice. Its expertise is patchy and scattered across institutions—the national labs, the Department of Defense, the National Science Foundation, and others. The key decision-maker on export controls is the Department of Commerce's Bureau of Industry and Security (BIS); it has surprisingly limited access to information, and greater expertise in the arcana of regulation than in the technologies that it is supposed to regulate.

Industry can offer expertise, but it usually comes with an enormous side-serving of self-interest. Anecdotally, BIS officials are deluged with claims from U.S. companies that this or that restriction ought to be imposed on their Chinese competitors. Other companies that depend on their relationship with China press the opposite case, presumably inspired by an equally touching devotion to the general interest.

The final problem is that the swamp outside is engulfing the small yard, as D.C. partisan politics invade the discussion over what ought to be restricted. The bipartisan House Select Committee on the Chinese Communist Party keeps trying to fence in an ever-greater territory of technologies. The standard 'I know it when I see it' definition of foundational technologies is hard to push back on or implement coherently.

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The most obvious example is the U.S. debate about China and AI. It is riddled with hyperbole. For example, there is fear that China will use AI to win an insuperable advantage on the battlefield and to further control what its citizens talk about and think. There is fear that AI strengthens authoritarianism and weakens democracy. Few of these fears are stupid, but few are based on hard evidence. They have nonetheless led to efforts to cut off the supply to China of advanced semiconductors—and to discussion about what more to do to hold China as far back on AI as possible.

The result of all this is that policy discourse about the United States, China, and technology has careened from one pathology to another: The cheery globalism of a decade ago has given way to today's diffuse paranoia. Now the national security conversation is almost exclusively focused on the impossible task of severing the ties of technological interdependence, with the only question being how much further to go.

GAIN OR PAIN?

Here's the rub: In cutting off interdependence with China, the United States may stymie its own technological development (see also the Triolo memo elsewhere in this report). In 2023 the NSF-funded **National Network for Critical Technology Assessment** warned that the United States faces a particularly stark tradeoff in areas where China is in the lead, such as batteries and electric vehicles.

For example, the United States seems likely to ban Chinese-connected electric vehicles from the U.S. market, notionally because this will protect U.S. security, but perhaps actually to protect the U.S. auto industry. Will this help U.S. industry and bolster security, or might it just make the United States fall further behind on manufacturing technologies that have both economic and security benefits? Any debate on the tradeoffs is hidden behind closed doors (see also the Gallagher memo in this report).

Instead, national security policy needs to be tailored to particular technologies—more hawkish or more dovish as appropriate. How to get there?

The work of Robert Jervis provides useful pointers. Jervis was one of the few international relations scholars to think about **complex technological trajectories**. He explained how beliefs—right or wrong—about feedback loops can shape policies. The challenge, then, is to better align policymakers' beliefs with emerging evidence as much as possible.

The federal government needs, at a minimum, a means to determine which technologies might be foundational and which might not. This would require guided and intelligent modelling of possible trajectories, and their likely consequences for advantage if interdependence continues in a given area. Policymakers would also need to investigate the counter-case. What are the costs of breaking off relations now and later? Are some forms of de-risking less damaging than others?

EXPERIMENT AND ITERATE

Previous grand schemes for remaking the federal science system, such as Vannevar Bush's 1945 report, ***Science, the Endless Frontier***, relied heavily on the brute force of big funding, and on the assumption that the federal government has the knowledge it needs, or can develop it internally. Much of the CHIPS and Science Act and Inflation Reduction Act approach to domestic industrial policy is similarly crude. Today America needs something more nimble.

A better starting point is suggested by two recent books that aren't about science policy at all—Jen Pahlka's ***Recoding America*** and Dan Davies's ***The Unaccountability Machine***. To tackle complex problems, Pahlka and Davies argue, institutions must be more flexible and experimental. They must gather information about which experiments have worked and how, and they must keep iterating. Something like that is what the United States needs, even if it is difficult to see how to graft it onto the federal government or insulate it from politics when failure happens.

Right now, the United States tends to make big bets, and double down on them. For example, U.S. semiconductor restrictions to China implicitly rest on the 'scaling' assumption, that large language models will grow ever more powerful as more compute and data is applied, leading to artificial general intelligence, which will provide an enormous advantage across military and civilian applications. If this is true, the United States has an interest in getting to this technology first—and has an advantage, since it has the biggest AI companies, and can hold China back by limiting its access to the most powerful parallel microprocessors.

However, some new evidence hints that **this hypothesis is shaky**. Scaling seems to be slowing down, suggesting that simpler models **such as DeepSeek's** will end up being more useful. That may mean that U.S. restrictions are less effective, or even largely irrelevant. So, what to do? The United States might put funding into a variety of approaches to AI. Most of these bets will fail, but the successes would pay for all.

Technology policy in America is a mess because it is hard to forecast how discoveries will develop and what their broader military, economic, political, and social consequences may be. Under current circumstances, this uncertainty generates fear rather than the optimism that it generated in the recent past. To manage this fear, policymakers have sought to secure the future within a walled garden. But technology—and the politics of its use—is not so easily corralled: It is a wildly unpredictable ecology.

FURTHER READING

Ananthaswamy, Anil. "How Close is AI to Human-Level Intelligence?" *Nature*, December 3, 2024. https://www.nature.com/articles/d41586-024-03905-1.

Farrell, Henry. "'Small Yard, High Fence': These Four Words Conceal a Mess." *Programmable Mutter* (blog). *Substack*, October 14, 2024. https://www.programmablemutter.com/p/small-yard-high-fence-these-four.

Metz, Rachel, Shirin Ghaffary, Dina Bass, and Julia Love. "OpenAI, Google and Anthropic Are Struggling to Build More Advanced AI." *Bloomberg*, November 13, 2024. https://www.bloomberg.com/news/articles/2024-11-13/openai-google-and-anthropic-are-struggling-to-build-more-advanced-ai.

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