

THE ASCENDING TECHNO-NATIONALISM IN THE U.S.–CHINA RIVALRY AND THE EU’S TECHNOLOGICAL INDEPENDENCE

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Abstract: *The rise of techno-nationalism is a key factor in defining the U.S.-China technological rivalry and it shapes the way the European Union pursues technological independence. Techno-nationalism has defined the way the U.S. and China are chasing strategic dominance through emerging technologies like AI, semiconductors, and cloud computing. This study argues that although the EU seeks to achieve digital sovereignty, it faces challenges from its fragmented industrial base, slow innovation cycle and reliance on foreign developed technologies in critical areas. The findings of this study emphasize the importance of developing the EU's industrial policy and increasing innovation capacity in addition to achieving regulatory objectives in order to maintain strategic autonomy in a rapidly changing world technology order.*

Keywords: *techno-nationalism, artificial intelligence, security, technology, power politics*

РАСТЯЩИЯТ ТЕХНОНАЦИОНАЛИЗЪМ В СЪПЕРНИЧЕСТВОТО САЩ-КИТАЙ И ТЕХНОЛОГИЧНАТА НЕЗАВИСИМОСТ НА ЕС

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Резюме: *Възходът на технонационализма е ключов фактор за развитието на съперничество между САЩ и Китай, ограничаващ стремежа на Европейския съюз за технологична независимост. Технонационализмът е определящ за начина, по който САЩ и Китай се конкурират за стратегическо господство чрез нови технологии, като изкуствен интелект, полупроводници и облачни платформи. Настоящото проучване показва, че ЕС е изправен пред предизвикателства, произтичащи от фрагментирана индустриална база, свръхрегулации и зависимост от чужди технологии. Проучването констатира важността на политиката на ЕС и увеличаването на иновационния капацитет за постигане на технологична автономност.*

Ключови думи: *технологичен национализъм, изкуствен интелект, сигурност, технология, силова политика*

Introduction

The term "techno-nationalism" describes government actions designed to provide for national technological independence and superiority. The modern definition of techno-nationalism is described as "new industrial policies for self-sufficiency in technology with the aim of establishing 'national champions' in high-technology sectors and limiting foreign competition in the face of emerging, high-tech capabilities" (Manning, R.A., 2019). In effect,

techno-nationalism combines economic, scientific, and military objectives into aim of securing the nation's technological safety and primacy (Evans, P., 2021). Currently, the U.S. and China are witnessing a surge in this type of goalsetting in their competition for supremacy. Both countries see the technological leadership (in AI, semiconductors, 5G, quantum computing, etc.) as critical to gaining or maintaining national economic and military advantage. Historically, the U.S. has always been an advocate of globalization and technological flux, but today, the U.S. government views China's advancements in technology as a direct threat to U.S. dominance (Ryan, M., & Burman, S., 2025).

Therefore, the U.S. has transitioned from a liberal-integrationist approach to one of selective decoupling in emerging technologies. Likewise, Beijing also sees technology as a key factor in achieving national resurgence in this century. China's leaders have explicitly linked national revival to science and technology as the "century of humiliation" was caused by technological inferiority (Evans, P., 2021). Behind the efforts of both countries there are selfish national interests that leave the technologically fragmented EU into a dependent position regarding its technological advancement. The next pages aim to describe the power dynamics between China and US and what is the EU's position in it.

Methodology

The research employs a qualitative, conceptual framework utilizing a complete and systematic evaluation of peer-reviewed literature, government and international policy documents, and institutional reports to conduct an analytical examination of comparative techno-nationalist approaches in the U.S. and China and their relations to the EU's pursuit of technological independence. The focus of this study is on three critical sectors, AI, semiconductors, and digital infrastructure, that are strategically important and evaluated through the lenses of policy framing, governance models, and regulatory frameworks. This study is interpretive in nature without employing empirical data collection. The theoretical underpinnings of this study are rooted in the concepts of techno-nationalism, digital sovereignty and strategic autonomy.

Discussion

The United States has developed a market-based model of technological innovation. Private companies and their investors drive much of the innovation in the U.S. with the government providing for research and infrastructure needs. The U.S. also has used export restrictions and trade-related policies directed toward adversaries to protect its own hi-tech

companies. Examples include placing Chinese companies like Huawei on the U.S. Commerce Department's Entity List, tightening rules on foreign AI-driven start-ups, and passing the 2022 CHIPS and Science Act, which is a \$53 billion program intended to restore domestic semiconductor manufacturing capacity.

However, enforcement turns to be selective. The U.S. does not rely solely on new laws, rather, the U.S. employs a decentralized approach, enforcing regulations and providing funding on a sector-by-sector basis. Thus, American companies (for example, Google, OpenAI, Amazon, and Microsoft) can proceed rapidly under flexible regulatory conditions, and federal agencies and Congress can apply sanctions or provide funding targeting specific areas. In other words, the U.S. is taking a market-oriented approach to technological innovation and views heavy regulation as a potential threat to its leadership position in this area (Davtyan, T., 2025).

China's model differs significantly from that of the U.S. The party-state plans to use long-term industrial planning, large-scale public R&D programs and state-owned companies to develop technology. China's "AI 2.0" strategy, for example, explicitly mobilizes government funds across the AI ecosystem. A RAND analysis states that by 2030 China plans to be the world's leader in AI, and will deploy state-funded investments "across the full AI technology stack, from chips to applications" (Chan, K. et.al., 2025). Additionally, there are already state-allocated funds available to help facilitate the advancement of AI technology in China.

While the Chinese tech giants operate within the context of a strong state guidance, companies such as Alibaba, Baidu, Tencent, Huawei and others are innovating at an extraordinary pace as they have the official R&D support and incentives to fill-in any gaps in innovation. This state-directed mobilization of resources to promote technological development goes well beyond AI. China's "Made in China 2025" and 14th Five-Year Plan dedicate billions to advance chips, biotechnology, quantum, robotics and other strategic technologies. Therefore, China is employing a focused national effort to develop the technologies it believes will give it an advantage.

Both the U.S. and Chinese governments have identified artificial intelligence as a strategic domain and have articulated ambitions to achieve leadership positions. The Trump Administration as well as and Biden Administration released national AI strategies that framed the emergence of an "AI revolution" as necessary for the continued prosperity and national security of the United States (Mazarr, M., Agachi, A., 2025) Likewise, China's State Council established national goals for AI by 2030 to develop AI into a \$100 billion industry and utilize

AI to further economic development and military capabilities¹. Consistent with their national goals, both superpowers have employed policy actions to achieve AI leadership. The U.S. has sought to control AI hardware through the imposition of export controls and restrictions on access to advanced computing chips, for example, by restricting access to NVIDIA GPUs, and possibly expanding export controls to other types of chips.

China has been developing its own alternative semiconductors and AI compute clusters to counter the effects of U.S.-imposed export restrictions. These export controls have blocked China's access to advanced computing chips, which are essential to the development of AI, resulting in Chinese companies reporting they are "compute-constrained." Similar dynamics exist in other strategic areas including semiconductors, telecommunications, biotechnology, and emerging areas like quantum computing. For example, the U.S. has implemented export controls and trade-related policies to prevent the acquisition of 5G telecommunications equipment from Chinese company Huawei by U.S. allies due to concerns related to techno-security. The EU has also entered this competition. The 2022 European Chips Act pledged to double the EU's percentage of the world's chip production from 10 percent to 20 percent by 2030 (European Commission, 2023). However, the EU does not have any companies that produce leading edge semiconductors and experts acknowledge that the EU "never really gained a foothold" relative to companies like Taiwan Semiconductor Manufacturing Company (TSMC) and NVIDIA. (Hancke, B., Garcia Calvo, A., 2025)

Although the U.S. government has provided broad guidelines, it has allowed Silicon Valley and academia to drive the vast majority of the innovation. China, on the other hand, has few formal limitations on the growth of tech companies, but instead directs them. China introduced "AI ethics" guidelines in 2019 and has recently taken steps to curb Big Tech's data misuse, but continues to provide state contracts and subsidies to the aforementioned. No country has placed extensive prescriptive rules on AI or other emerging technologies beyond very limited contexts. In fact, researchers argue that only if a government wishes to maximize innovation it will adopt minimal regulation (Keith, J.D.C. et.al. 2024).

This perspective provides insights regarding why Washington and Beijing have thus far limited their regulatory oversight as both seem to prioritize the efforts in the technological arms race. Conversely, the European Union has developed a nearly opposite approach. Since the mid-2010s, the EU has positioned itself as the world's primary regulator and rule-maker for technology, and seeks ways to codify European values (such as privacy, security, and ethics)

¹ State Council of the People's Republic of China, 2017.

into technology standards. For example, the General Data Protection Regulation (GDPR) and the forthcoming AI Act reflect this orientation. The EU's AI Act categorizes AI applications according to level of risk and places strict requirements on high-risk AI applications. Critics contend that these laws could limit innovation. For example, a legal study of generative AI models indicated that the Act could stifle innovation, especially for small companies, due to the possibility of expensive compliance costs (Nizza, U., 2024).

Similarly, a Brookings Institution analysis compared the two approaches of the U.S. whose approach is "very decentralized among federal agencies" with little creation of new lawmaking authority, and the EU's approach which is characterized by a "more comprehensive range of legislation" with stricter new requirements for AI and platform services (Engler, A., 2023). Evidently, the EU currently is choosing a regulatory route while the U.S. still tends to emphasize voluntary and industry-based solutions. The deepening rivalry between the United States and China in technology and information systems presents critical challenges to the European Union. On one hand, Europe acknowledges the necessity of digital sovereignty and seeks to diminish dependence upon the technological capabilities of the United States and China to protect its economic interests and citizens. To this end, the European Union has implemented a number of policies designed to achieve digital sovereignty. For EU is critical to diminish its reliance on foreign technology and the EU Chips Act is a step in that direction.

The GAIA-X program, which is an attempt to develop a cloud system based in the European Union is another one together with broader regulations such as the Digital Service Act. Similarly, the European Union's new AI strategy, which is part of a larger effort to increase the competitiveness of the European Union through technological advancement, identifies the development of cutting-edge AI infrastructure, and talent and investment as necessary to "strengthen the EU's technological competitiveness and independence" (Youngs, R., 2025). The European Union and its member-states are investing heavily in research and development of their own technologies, increasing defense spending in order to encourage and assist local firms and establishing alliances, such as those with Japan and Taiwan, to secure the supply chains.

However, despite high aspirations, the reality of the situation facing the EU is difficult. The EU's industrial base and venture ecosystems are generally thin in comparison to those of the United States and China. An LSE study has stated that the European Union is "very dependent on the U.S. and China in most levels of the digital stack, from network equipment to online platforms," and by sector, the EU has players in network hardware (Hancke B., Garcia

Calvo, A., 2025), but there are no equivalent companies to Amazon Web Services or Google Cloud.

The EU Chips Act's flagship projects such as multi-billion-euro investments in Germany, Italy, France, are currently under construction, but target somewhat older process technologies and are experiencing delays. The European Union is even farther behind in cloud and software. While GAIA-X (established in 2020) was intended to be a federated cloud system for the EU's cloud services under the strictest data sovereignty requirements, criticism appeared towards the slow adoption and the dependency on non-EU companies, undermining its own objectives regarding sovereignty. Furthermore, nearly all EU governments and businesses continue to utilize American cloud technologies such as AWS, Azure, Google Cloud, and software applications - a dependence on U.S. technology that was revealed to be a vulnerability during the COVID-19 pandemic. Moreover, OECD data reveal that the total R&D growth rate of the EU with 1.6 percent in 2023 is significantly lower than that of China at 8.7 percent (OECD, 2025). Thus, the scientific and industrial capacities of the EU risk declining relative to those of China.

The technical abilities of the EU resemble more of a catch-up effort than a leadership initiative. While the EU's regulatory rigidity protects consumers, it can also hinder the ability of EU-based startups to innovate rapidly. In contrast, U.S. and Chinese startups enjoy greater flexibility due to the less stringent regulatory environments. This provides U.S. and Chinese startups with a competitive advantage in terms of rapidity of deployment and access to data. While many cutting-edge technologies deployed in the EU are still created by U.S.-based companies, EU-based firms often license or purchase technology from abroad. Europe faces the possibility of being "held hostage" by American cloud services because EU-developed alternatives, such as GAIA-X, continue to involve collaboration with U.S. technology giants. The EU finds itself caught between the two superpowers on the technological stage. The emerging U.S.-China technology cold war creates pressure on the EU to pursue greater autonomy, but the EU is so far unable to achieve it. The EU's Single Market can serve as a vehicle for scaling new industries, but only if combined with substantial investment and adequate industrial policy.

Conclusion

Techno-nationalism has taken hold in both the U.S. and China, perceived as a critical component of national power. Each nation views the creation of advanced capabilities in technologies including AI, 5G, semiconductors, and others as essential for maintaining military

strength and economic advantage. As such, the U.S. is using its dynamic and competitive private sector combined with directed government spending while China is leveraging state-directed planning and national conglomerates to drive development. Each has chosen to prioritize speed and independence above all else. For the EU, the implications are clear. If it does not create its own capacity for technological advancement to counter the effects of dependency, it will fall behind. However, the EU's highly regulated environment and the fractured nature of its markets will impede the results it hopes to achieve. The EU is facing a challenge to reconcile its "sovereignty" objectives with competitiveness and develop policies allowing it to build domestic capabilities such as chips, cloud, AI, etc., without stifling the entrepreneurship. How well the EU performs in balancing these competing objectives will determine if the EU remains a "rule-setter" or becomes a true, independent tech power.

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