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As Quantum Computing Evolves, So Do Antitrust Risks

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The growing commercialization of the quantum computing industry continues to attract attention from investors, policymakers and industry actors. Recent developments in the U.S. underscore that point.

On May 21, the U.S. Department of Commerce announced approximately $2 billion in incentives under the CHIPS and Science Act for nine quantum companies to assist with development of the industry, in exchange for equity stakes.[1]

That effort has been reinforced by a June 22 executive order calling for the development of a strategy to integrate quantum across government entities. Together, those public-sector actions coincide with and support a broader wave of private-sector activity, including public offerings, strategic partnerships and experimentation with offerings for quantum as a service.

As this highly competitive industry picks up steam, legal issues are beginning to take shape. And putting the word "quantum" in front of a product, platform or business model does not place it beyond the reach of the antitrust laws.[2] Although the science behind quantum computing is technically complex, the competition questions relevant to the industry are, in many ways, deeply familiar.

This article explores some of the antitrust risks that may be at play as the business of quantum computing develops, and the potential impact of recent federal legislation in support of the industry.

A key focus of this article is the potential competition issues that could take root in the quantum computing industry, which may resemble issues that courts and regulators have confronted in other technology markets: control over key infrastructure, vertical integration, self-preferencing, standard setting, interoperability, access to scarce inputs, exclusive dealing and information sharing.

Some Differences Between Classical and Quantum Computers

Quantum computers differ from classical counterparts in several ways. Classical computers process information using bits, which are typically represented as 0s and 1s. Quantum computers, however, use quantum bits, or qubits, which can simultaneously simulate multiple states — e.g., 0s and 1s — at the same time.

This ability does not mean that quantum computers are likely to replace ordinary computers for everyday tasks. Rather, their potential value lies in particular use cases, such as logistics optimization, pharmaceuticals research, weather mapping, cryptography and financial modeling.

Further, quantum computers are still at a relatively early stage of development in comparison to classical machines. Current quantum systems remain error prone, making one of the central challenges in the field the development of machines that can perform reliably at scale.

As a result, companies have pursued different approaches to building quantum machines and the qubits that power them. This development process is competitive. The uncertainty of that competition makes the market highly dynamic, but it also means that early advantages in funding, talent or materials could have lasting competitive significance.

A further distinction is that many users are unlikely to access quantum computers directly, but instead through layered platforms that connect customers to quantum hardware and software.

Given the complexity and expense of quantum computers, users are likely to engage the quantum stack, which is a layered system of hardware, control systems, intermediate representations, programming languages, cloud interfaces and other layers that give users remote access to quantum machines without requiring them to own or operate the underlying hardware.

Those services, however, are not merely remote-access tools; they may become platform layers that aggregate hardware and software, route users among different systems, and shape how and which applications are built and run.

This layered architecture matters when thinking about antitrust issues for quantum computing. Competition may occur not only between quantum developers, but also within and across the layers of the stack.

A company that controls a critical interface, compiler, cloud environment or standard may be able to influence which hardware, software or applications succeed. That is one reason investment in the developing quantum ecosystem may prove competitively significant. Early funding can influence not only who builds better quantum machines, but also who controls the surrounding infrastructure through which customers access them.

Public Capital in the Race

To support the continued development of the industry, national governments have taken an affirmative approach to support its development. The U.S. is no different. The National Quantum Initiative Act, enacted in 2018, was designed to provide a coordinated federal program to accelerate quantum research and development for the economic and national security of the U.S.

The act created a federal structure for quantum policy, including coordination across agencies and advisory mechanisms to help guide the government's approach.

As that framework is set to expire in December 2029, both the U.S. House and the Senate have advanced versions of legislation to reauthorize and expand the U.S.'s national quantum program. The two approaches — the U.S. House of Representatives' bill having been introduced on April 23, and the Senate's version passing committee on April 14 — appear to share a common understanding: Quantum is no longer only about basic research.[3]

It is increasingly about commercialization, supply chains, workforce, security, standards and international coordination. For example, the U.S. and Sweden signed a memorandum of understanding on May 22, encouraging further cooperation through their shared membership in the Quantum Development Group, a coalition of 13 nations committed to coordination on quantum technology policy. That MOU aims to build a "trusted quantum ecosystem" and "secure and open standards."

For the purposes of this analysis, the point here is not that federal investment in quantum computing is anticompetitive. Rather, government funding does not eliminate antitrust risk.

Companies that receive public support will likely still compete in private markets, negotiate commercial contracts, join standards organizations, hire talent, license intellectual property and form partnerships — all the sorts of activities that can and have drawn antitrust scrutiny. The existence of a grant, letter of intent, cooperative agreement or research program does not itself immunize otherwise private conduct.

Indeed, public funding might make compliance more important because government-backed projects often involve multiple competitors interacting in settings where technical collaboration and commercial strategy can blur. In short, quantum companies that received federal funding may still need to collaborate to solve hard technical problems, but they must do so without converting that collaboration into a mechanism for exclusion, coordination, or control over emerging markets.

Quantum's Potential Antitrust Fault Lines

Antitrust risks in quantum computing could mirror those same categories that have shaped other technology markets. Five such issues are discussed below.

1. Platform Control and Self-Preferencing

Platform control and self-preferencing may become important. The quantum stack creates multiple potential bottlenecks. A firm active across several layers may have incentives to favor its own tools, applications, hardwar or cloud services. That could take the form of faster access, better features, deeper technical documentation, preferential compatibility, or default routing through affiliated systems.

Some preferences may be justified, but others may raise concerns if they make rivals' products less viable or effectively require customers to use an integrated provider's ecosystem to participate meaningfully in the market.

2. Interoperability and Standard Setting

Interoperability may become a central competitive battleground. Quantum computing is still developing, and many technical standards are not settled. That makes standard setting especially important.

Standards can be highly procompetitive: they can reduce costs, increase interoperability, facilitate customer adoption, and allow firms to build complementary products with confidence.

Standards can also pick winners. A technical standard may advantage one architecture, one implementation, or one group of firms. That is not automatically unlawful; standards necessarily involve making choices about which systems might work for multiple actors. But the risk comes from how those standards are set, and who stands to benefit from their success.

For this reason, antitrust compliance in this context should not be treated as an afterthought. It should be built into the governance of industry groups or other collaborations from the beginning.

3. Competitor Collaboration and Information Sharing.

Information sharing remains a risk for quantum developers in the same way it does for other industries. This risk is particularly salient because as the government's recent investment suggests, quantum computing will likely develop through industry consortia or government-supported research centers.

Participants should therefore define the legitimate purpose of the collaboration, limit competitively sensitive information exchanges, document objective membership and access criteria, and avoid using technical processes as a proxy for market allocation or exclusion.

4. Access to Inputs

Access to scarce inputs may matter. The growth of quantum computing will likely depend on highly specialized talent, cryogenic systems, photonics, superconducting materials, trapped-ion systems and other technical resources.

The Commerce Department's recent quantum funding announcement itself identifies unresolved engineering problems such as device reproducibility, error rates, cryogenic systems integration, control hardware, ultra-fast readout electronics, photonic loss and interconnects. Where key inputs are scarce, exclusive arrangements, preferential access, or acquisition strategies may draw scrutiny if they substantially foreclose competitors.

5. Mergers, Acquisitions and Strategic Investments

Finally, mergers and strategic investments may receive attention. While mergers or acquisitions by a larger technology platform, cloud provider, or semiconductor company may be supported by strong efficiency arguments, Hart-Scott-Rodino Act scrutiny over these mergers may be particularly heightened given the government involvement in the industry.

Regulators may also ask whether the transaction eliminates a nascent competitor, gives the buyer control over a critical layer of the stack, or allows the combined firm to disadvantage rivals that depend on the acquired technology.

Antitrust Compliance Points as Quantum Commercializes

The emerging federal quantum framework reflects an understandable policy judgment: Quantum computing is strategically important, and the U.S. has an interest in supporting domestic capability. But those legislative efforts do not diminish the antitrust risks that may arise as the industry matures.

If anything, they make it more important to identify those risks early. Public support can catalyze markets, but it can also accelerate the moment at which private firms begin competing over access, standards, customers, data, talent, infrastructure and technical chokepoints.

For quantum companies, the practical takeaway is straightforward. Antitrust compliance should develop alongside technical development. Companies participating in consortia, standards efforts, testbeds, multiparty partnerships or projects funded by grants should pay close attention to governance, information sharing, membership rules, access terms, exclusivity provisions, interoperability decisions and intellectual property policies.

Firms building vertically integrated quantum stacks should be prepared to explain product-design choices, access limitations and integration decisions in procompetitive terms.

Investors and acquirers should consider whether a deal implicates nascent competition, control over critical inputs, or foreclosure theories.

Quantum computing may be novel. The antitrust questions are not. As quantum moves from laboratory research to commercial infrastructure, the industry should expect familiar competition principles to follow it.

[1] https://www.nist.gov/news-events/news/2026/05/department-commerce-announcesletters-intent-9-companies-2-billion

[2] https://www.mindingyourbusinesslitigation.com/2026/04/exploring-potential-antitrustrisks-for-quantum-computing/.

[3] https://www.congress.gov/bill/119th-congress/housebill/%208462?r=1%3B+https%3A%2F%2Fwww.commerce.senate.gov%2Fby-cantwelland-+young-national-quantum-initiative-reauthorization-act-unanimously-passes-commercecommittee-+on-world-quantum-day%2F.&s=1

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