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## Quantum Computing Commercialization Roadmap

Hardware milestones, enterprise use cases, and investment landscape

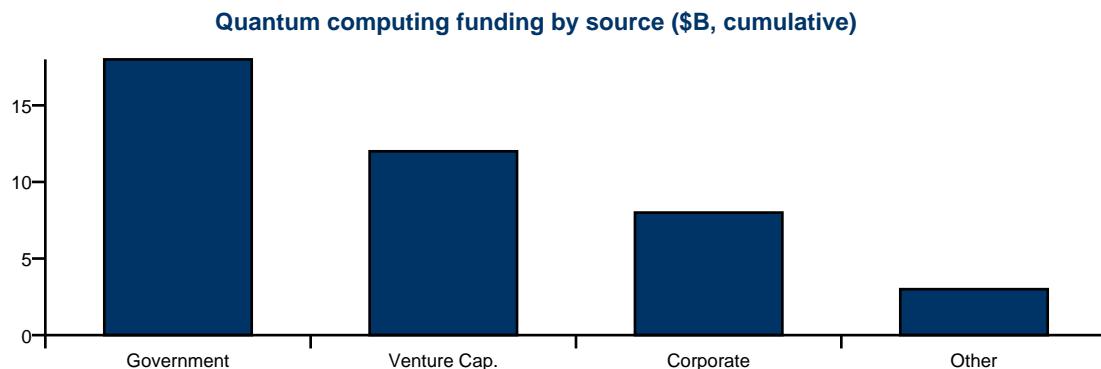
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## Executive Summary

Quantum computing is transitioning from a research curiosity to an early stage commercial technology, with hardware milestones accelerating and enterprise experimentation broadening. We present our framework for assessing the commercialization timeline, the addressable market, and the investment landscape across public and private companies. Our analysis covers the leading hardware approaches, software and services layers, and the industries most likely to benefit from quantum advantage. We maintain a long term constructive view while acknowledging that near term revenue generation remains limited for most players.

## Hardware progress and technology landscape

Multiple hardware approaches are advancing in parallel, including superconducting, trapped ion, photonic, and neutral atom platforms. Recent demonstrations of error correction improvements and logical qubit milestones have increased confidence in the path to fault tolerant quantum computing. However, commercially relevant machines capable of outperforming classical computers on practical problems remain several years away in our base case. We assess the technology readiness level of each approach and discuss the competitive dynamics among leading hardware providers. Investment in quantum hardware has been substantial, with both government and private sector funding increasing. We provide a comparison of the leading platforms across key performance metrics.

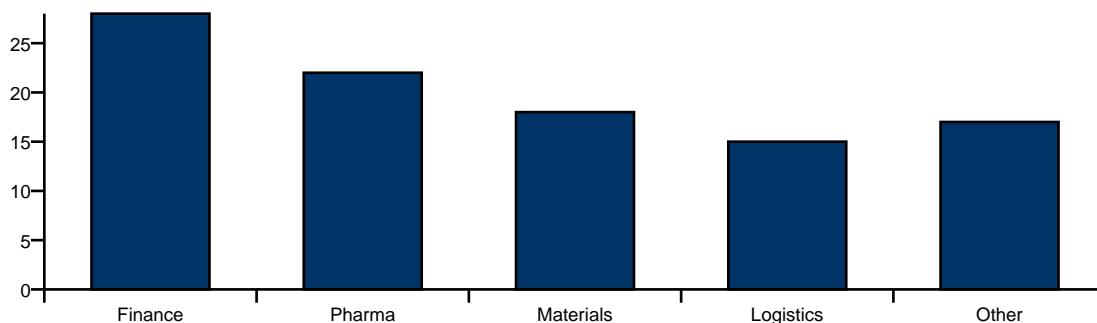


Source: J.P. Morgan Research. Estimated cumulative global funding through 2026.

## Software, algorithms, and services

The quantum software ecosystem is developing in parallel with hardware, with cloud based access platforms enabling broader experimentation. Algorithm development for optimization, simulation, and machine learning applications is progressing, though practical advantage over classical methods is not yet established for most problems. Enterprise engagement is growing, with financial services, pharmaceuticals, materials science, and logistics among the most active sectors. We discuss the role of hybrid classical quantum workflows and the timeline for meaningful productivity gains. Service providers offering consulting, integration, and managed quantum computing are also emerging, and we assess the revenue potential for this layer.

**Enterprise quantum pilots by industry (%)**

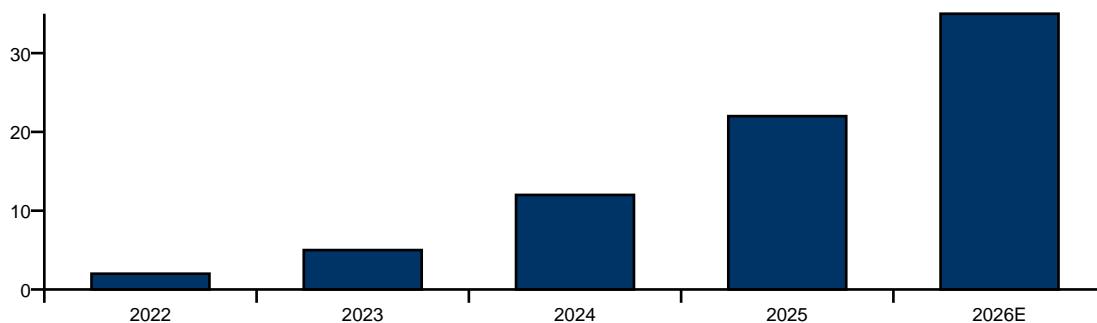


Source: J.P. Morgan estimates. Share of known enterprise pilot programs.

## Enterprise use cases and adoption

Financial services firms are exploring quantum computing for portfolio optimization, risk simulation, and fraud detection. Pharmaceutical and chemical companies are investigating molecular simulation for drug discovery and materials design. Logistics and supply chain optimization represent another promising area, though classical heuristics remain competitive for most current problem sizes. We survey the state of enterprise pilots and partnerships and discuss the barriers to production deployment, including integration complexity, workforce readiness, and intellectual property considerations. Our timeline assumes initial commercial impact in select use cases by 2028 to 2030, with broader adoption following as hardware scales.

**Logical qubit milestones (cumulative demonstrations)**



Source: J.P. Morgan Research. E = estimate. Public demonstrations of logical qubits.

## Investment landscape and recommendations

The quantum computing investment landscape includes a mix of pure play startups, diversified technology companies with quantum divisions, and component and services providers. Publicly listed exposure is limited but growing, with several companies offering direct or indirect quantum revenue. We assess the risk reward for listed names and discuss the implications for technology sector investors. Valuation remains challenging given the early stage of commercialization, and we caution against extrapolating long term revenue potential into near term pricing. We provide a framework for monitoring progress and for identifying inflection points that could drive investment returns.

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