QBTS Short Report

Pelican Way Research

Intro

Why We're short QBTS

- QBTS has been in business since 1999, has consistently burned cash, and has no clear path towards material revenue or profits. As a result, dilution will likely continue.
- QBTS is competing against mega-cap tech companies with limitless budgets.]
- All forms of quantum computing are likely far off.
- QBTS is the only company attempting to build quantum annealers which experts believe are highly likely to be inferior to gate-based quantum computers.
- We are skeptical annealers will have a material time-to-market advantage over gate-based quantum computers.
- Recent hype around D-Wave's 'Quantum Supremacy' announcement has created a short term tactical short-selling opportunity in QBTS.

"Two main paradigms for quantum hardware are then discussed: quantum annealing and gate-based quantum computing. While quantum annealers are effective for some optimization problems, they have limitations and cannot be used for universal quantum computation"

-Benjamin C. B. Symons, David Galvin, Emre Sahin, Vassil Alexandrov, and Stefano Mensa. 2023

https://arxiv.org/abs/2305.07323

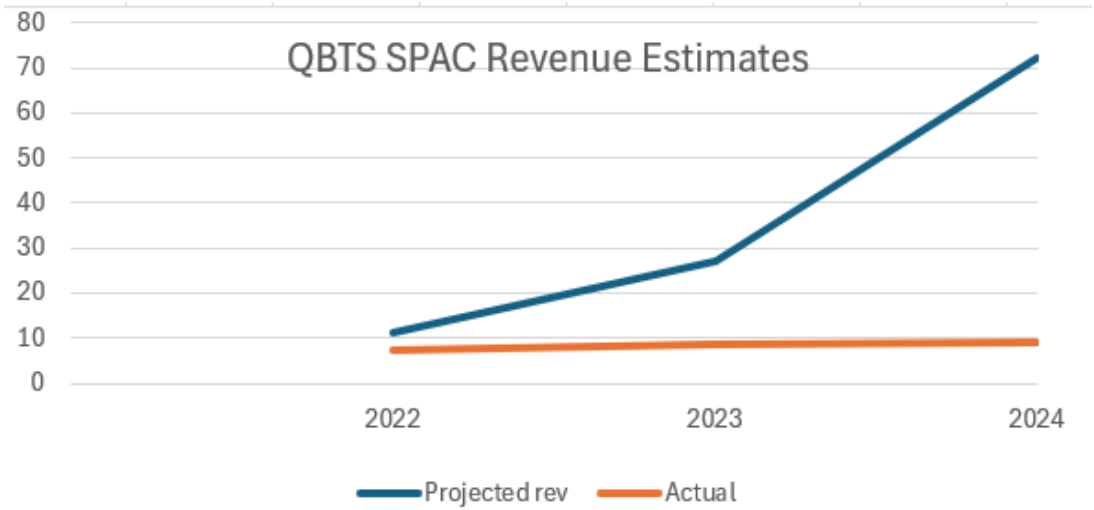
Negative FCF + Dilution will likely Continue

No Clear Path to FCF

- QBTS revenues are minimal and barely growing: $7.17m in 2022 to $8.85m in 2024.
- Forward consensus QBTS revenue forecasts suggest QBTS will continue to burn cash and therefore likely continue to have to dilute shareholders.
- QBTS is not a start-up – it has been around for ~25 years and still has not produced a commercially successful product.
- QBTS made big promises when coming public via SPAC in 2022 and has fallen far short of those promises.

No Clear Path to FCF

- Results have fallen FAR short of the forecasts in QBTS's 2022 SPAC IPO presentation.
- 2024 revenue was projects to be $72 mm – actual 2024 revenue was $8.85mm = ~87% lower than projected.
- 2025 revenue was expected to be $219mm. The current 2025 consensus revenue estimate is $22m = ~89% lower than projected.



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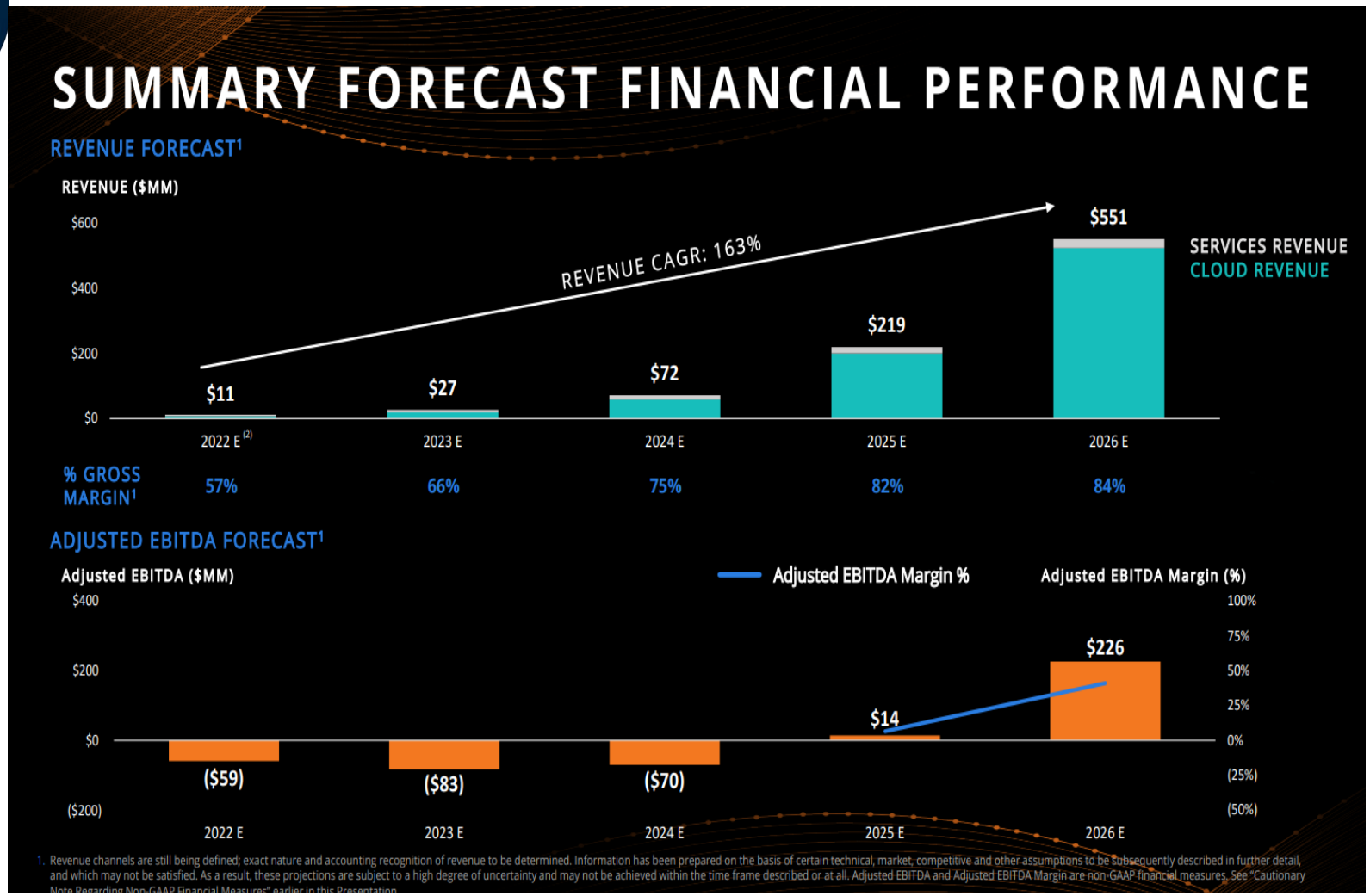
QBTS SPAC-DECK February 2022



Dilution

- With revenues not increasing meaningfully and no clear path to profitability, QBTS will likely continuing to rely on equity offerings to fund itself - diluting shareholders significantly.

- The need to raise capital incents management to over-promise in the short term to maximize share price.

- QBTS diluted share count has more than doubled in just the last 2 ½ years: to 233 mm in 4Q24 from 112 mm in 2Q22.

- Raising capital also requires a strong macro-economic backdrop and strong capital markets, which have recently been called into question.

Raising cash and capitalizing on hype

- QBTS had $29 mm in cash left 9/30/24 but was able to capitalize on the excitement around Google's "Willow" quantum announcement to raise $175m via an ATM offering at ~$5/share.
- On January 25th QBTS did yet another offering at $6.10 for $150m.
- These were QBTS's first offerings since going public via SPAC in 2022. We believe these raises just delayed the inevitable.
- In addition to ATM offerings, QBTS also had an agreement to sell up to 35m shares to Lincoln Park Capital Fund, LLC. This was effectively another form of ATM offering as Lincoln Park reserves the right to immediately resell the shares.

https://app.quotemedia.com/data/downloadFiling?webmasterId=90423&ref=319010217&type=HTML&symbol=QBTS&cdn=768935e21b3227d345178f2d627b0695&companyName=D-Wave+Quantum+Inc.&formType=10-K&formDescription=Annual+report+pursuant+to+Section+13+or+15%28d%29&dateFiled=2025-03-14
https://ir.dwavesys.com/news/news-details/2024/D-Wave-Reports-Third-Quarter-2024-Results/default.aspx
https://blog.google/technology/research/google-willow-quantum-chip

QBTS A Minnow Competing Against Mega-Cap Whales

Raising cash and capitalizing on hype

- Large companies such as Google, Amazon and IBM are all pursuing gate-based quantum computing and can sustain enormous development costs indefinitely from their internally generated cash flows.

- QBTS on the other hand is free cash flow negative - requiring constant external funding to remain in business.

- Despite many announcements and “breakthroughs”, even large competitors are far from true quantum computing commercialization.

- https://www.dwavequantum.com/company/newsroom/press-release/d-wave-reports-fourth-quarter-and-year-end-2023-resultshttps://ir.dwavesys.com/news/news-details/2024/D-Wave-Reports-Third-Quarter-2024-Result
- https://www.wired.com/story/googles-quantum-supremacy-isnt-end-encryption

All Forms of Quantum are far Off

Raising cash and capitalizing on hype

- timeline for quantum to be commercially viable.

- An Amazon spokesperson said: “"While quantum computers may not be commercially viable for 10-20 years, bringing quantum computing to fruition is going to take an extraordinary effort, including sustained interest and investment across the industry starting now.”

- Jensen Huang, CEO of Nvdia said: “If you kind of said 15 years for very useful quantum computers, that would probably be on the early side”

- Google’s Quantum lead offers a much shorter timeline saying: "We’re optimistic that within five years we’ll see real-world applications that are possible only on quantum computers,“ We believe that this is a highly optimistic timeline (but it if does come to fruition it would be the death-knell of QBTS.)

https://www.businessinsider.com/amazon-exec-casts-doubt-microsoft-quantum-claims-2025-3
https://observer.com/2025/01/is-nvidias-jensen-huang-right-about-quantum-computing/
https://www.reuters.com/technology/google-says-commercial-quantum-computing-applications-arriving-within-five-years-2025-02-05/

Annealers Vs Gate Based

Quantum Annealers Tech Disadvantage

- Quantum Annealers are designed for simpler optimization problems such as supply chain optimization or portfolio optimizations and are more limited than gate-based models in their use cases and real-world applications.

- Gate Based Quantum Computers are built for larger and more complex tasks, such as advanced codebreaking or enhancing machine learning to process extremely large data sets faster and more efficiently than previous methods. They are not limited in their problem sets or real-world applications.

We are skeptical of any time to market advantage for annealers

Quantum Annealers Tech Disadvantage

- Neither gate based quantum computers nor annealers appear close to commercialization.
- More and better capitalized competitors are pursuing gate-based quantum.
- Gate based quantum is almost certain to be superior.
- QBTS's R&D budget is a fraction of what competitors can and do spend.
- *Given all this – we are skeptical that*
  - *a) Annealers will be commercially viable once gate-based quantum computers reach commercialization,*
  - *b) QBTS will develop a commercially successful annealer before gate-based quantum computers are available, and*
  - *C) Even if QBTS does have a time-to-market advantage, we doubt the window will be very long.*

Recent QBTS announcement is just more hype

QBTS's Claim of "Quantum Supremacy

- QBTS claims to have reached "quantum supremacy" with their Advantage2 system.
- QBTS claims that this is the first instance of quantum supremacy (a large advantage over classical techniques) on a useful problem.
- Allegedly this problem would have taken "nearly one million years and more than the world's annual electricity consumption to solve using a classical supercomputer"

- https://www.businesswire.com/news/home/20250312803163/en/Beyond-Classical-D-Wave-First-to-Demonstrate-Quantum-Supremacy-on-Useful-Real-World-Problem

Recent QBTS announcement, more hype.

- While this is a scientific achievement, aside from a 1-time sale of 1 unit in 1Q25, it does not appear to have any impact on the future revenue or cash flows of the company.

- If this was truly a game-changing breakthrough one would expect it would result in more than a one-time couple million dollar boost to sales.

- Mega-Cap tech companies have a history of acquiring companies they believe to be revolutionary regardless of valuation, why have none of them pursued QBTS?

- Multiple companies have claimed “quantum supremacy” in the past (Google in 2019, IBM in 2023), however these ”breakthroughs” were eventually recreated via clever applications of classical computing – ie the gap between quantum computing (as it stands today) and classical computing has not expanded.

- https://www.scientificamerican.com/article/are-d-waves-claims-of-quantum-advantage-just-quantum-hype/#:~:text=What%20Did%20D%2DWave%20Do,a%20classical%20computer%20to%20handle.
- https://markets.businessinsider.com/news/stocks/d-wave-quantum-sees-q1-revenue-exceed-10m-consensus-2-6m-1034475558

Conclusion

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We believe QBTS is a fundamentally flawed business and will likely end up worth worthless.

1) QBTS has been in business since 1999, has consistently burned cash, and has no clear path towards material revenue or profits. As a result, dilution will likely continue.
2) QBTS is competing against mega-cap tech companies with limitless budgets.
3) All forms of quantum computing are likely far off.
4) QBTS is the only company attempting to build quantum annealers which experts believe are highly likely to be inferior to gate-based quantum computers.
5) We are skeptical annealers will have a material time-to-market advantage over gate-based quantum computers.
6) Recent hype around D-Wave's 'Quantum Supremacy' announcement has created a short term tactical short-selling opportunity in QBTS.

Appendix

Professional dismissal of Annealers. 1/3

- 2024 article From Quantum News: **"Another key distinction between Quantum Annealing Algorithms and Gate-based Quantum Computing is their scalability. Experimental implementations of Quantum Annealers have been developed using various qubit architectures, but scaling up to larger problem sizes remains a significant challenge. In contrast, Gate-based Quantum Computing has made significant progress in recent years, with the development of more advanced quantum processors and control techniques.“**
- https://quantumzeitgeist.com/quantum-annealing-vs-gate-based-quantum-computing/

- **Simple Explanation:** The big difference between Quantum Annealing and Gate-based Quantum Computing is how well they can handle bigger problems. While researchers have built different types of Quantum Annealers, making them work for larger problems is still very difficult. On the other hand Gate-based Quantum Computing has been improving quickly, with better quantum processors and control methods that make it easier to scale up.

Professional dismissal of Annealers. 2/3

- 2019 paper by Quantum Experts Daniel Vert, Renaud Sirdey and Stephane Louis: **"Thus, our results suggests that quantum annealing, at least as implemented in a D-Wave device, falls in the same pitfalls as simulated annealing and therefore suggest that there exist polynomial-time problems that such a machine cannot solve efficiently to optimality."**
- https://arxiv.org/abs/1910.05129
- **Simple Explanation:** D-Wave's quantum annealer struggles with the same weaknesses as a classical method called 'simulated annealing'. In simple terms, there are certain problems that this quantum annealer still can't solve quickly or efficiently, even though they should be solvable in a reasonable amount of time.

Professional dismissal of Annealers. 3/3

- 2024 Paper by Quinton, Myhr, Barani, and del Granado: “Quantum computing is rapidly advancing, harnessing the power of qubits’ superposition and entanglement for computational advantages over classical systems. However, scalability poses a primary challenge for these machines. By implementing a hybrid workflow between classical and quantum computing instances, D-Wave has succeeded in pushing this boundary to the realm of industrial use. Furthermore, they have recently opened up to mixed integer linear programming (MILP) problems, expanding their applicability to many relevant problems in the field of optimisation. However, the extent of their suitability for diverse problem categories and their computational advantages remains unclear. This study conducts a comprehensive examination by applying a selection of diverse case studies to benchmark the performance of D-Wave’s hybrid solver against that of industry-leading solvers such as CPLEX, Gurobi, and IPOPT. The findings indicate that D-Wave’s hybrid solver is currently most advantageous for integer quadratic objective functions and shows potential for quadratic constraints. To illustrate this, we applied it to a real-world energy problem, specifically the MILP unit commitment problem. While D-Wave can solve such problems, its performance has not yet matched that of its classical counterparts.”

https://arxiv.org/html/2409.05542v1

- Simple Explanation: D-Wave it still has trouble with scaling up, it has combined regular and quantum computers to solve certain problems, including MILPs (Mixed Integer Linear Programming), which are problems that involve both whole numbers and real numbers. A study showed that D-Wave works well for some problems, but it's still not as good as regular computers at solving real-world problems like the MILP unit commitment problem.

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