Quantum-assisted synthetic data for proxy reconstruction in financial industry

Experiment Business Pitch

Context/problem

Financial institutions are strictly regulated by ECB. In particular, statistical values need to be computed to cover up the risk of most financial instruments in order to avoid crushes

REGULATORY CAPITAL

Value at Risk: VaR

Stressed Value at Risk: SVaR

However, **PROXIES** with high accuracy are hard to obtain:

High computational cost

Data quality of the historical series

Window period dependency

Assets may lack sufficient historical data for accurate calculation of VaR and SVaR. The solutions are

PROXIES

Business example

Imagine that a financial institution wanted to invest in Tesla. What was the option during the first two years?

Tesla vs. Ford
Market cap, in billions
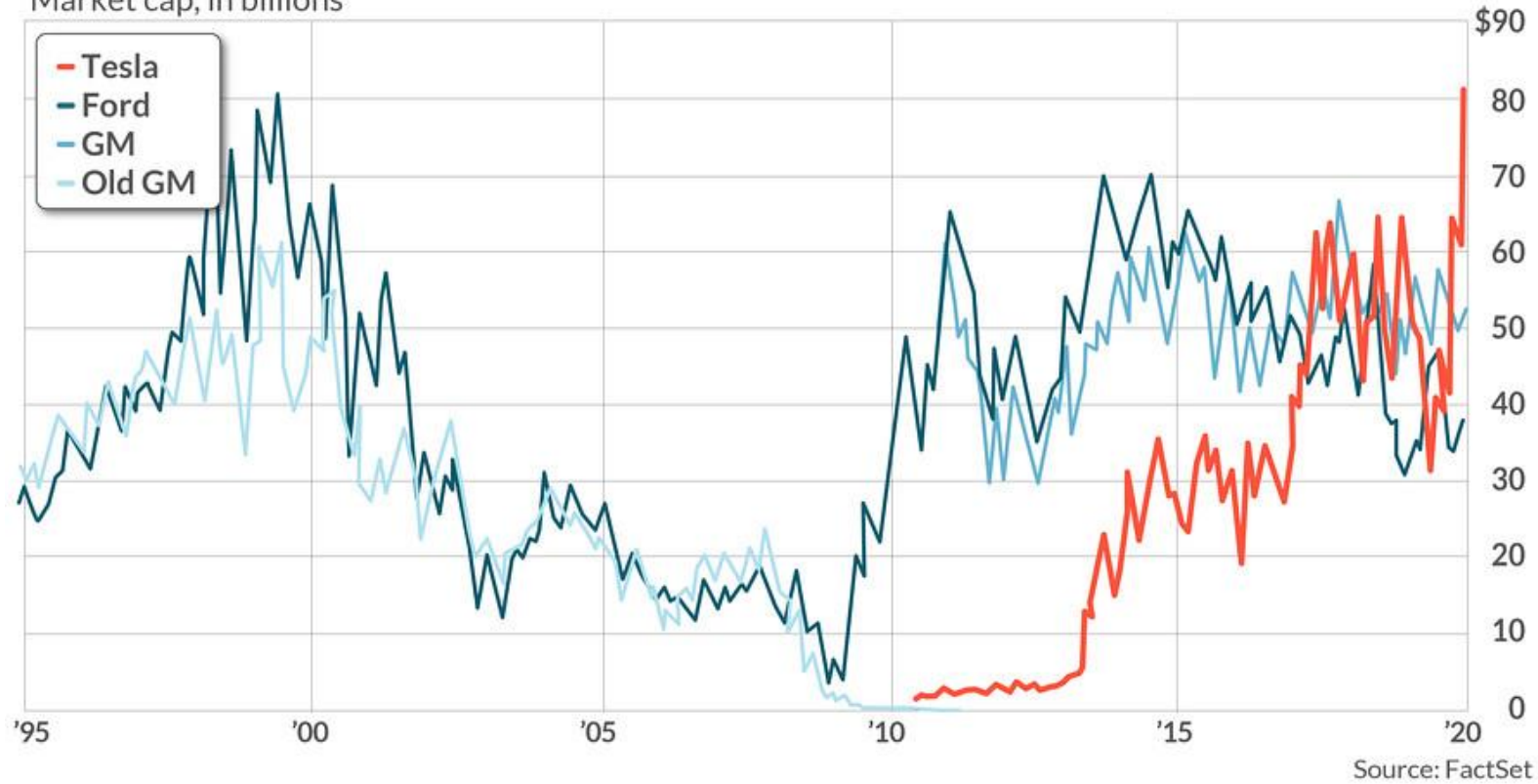
- Tesla
- Ford
- GM
- Old GM

Source: FactSet
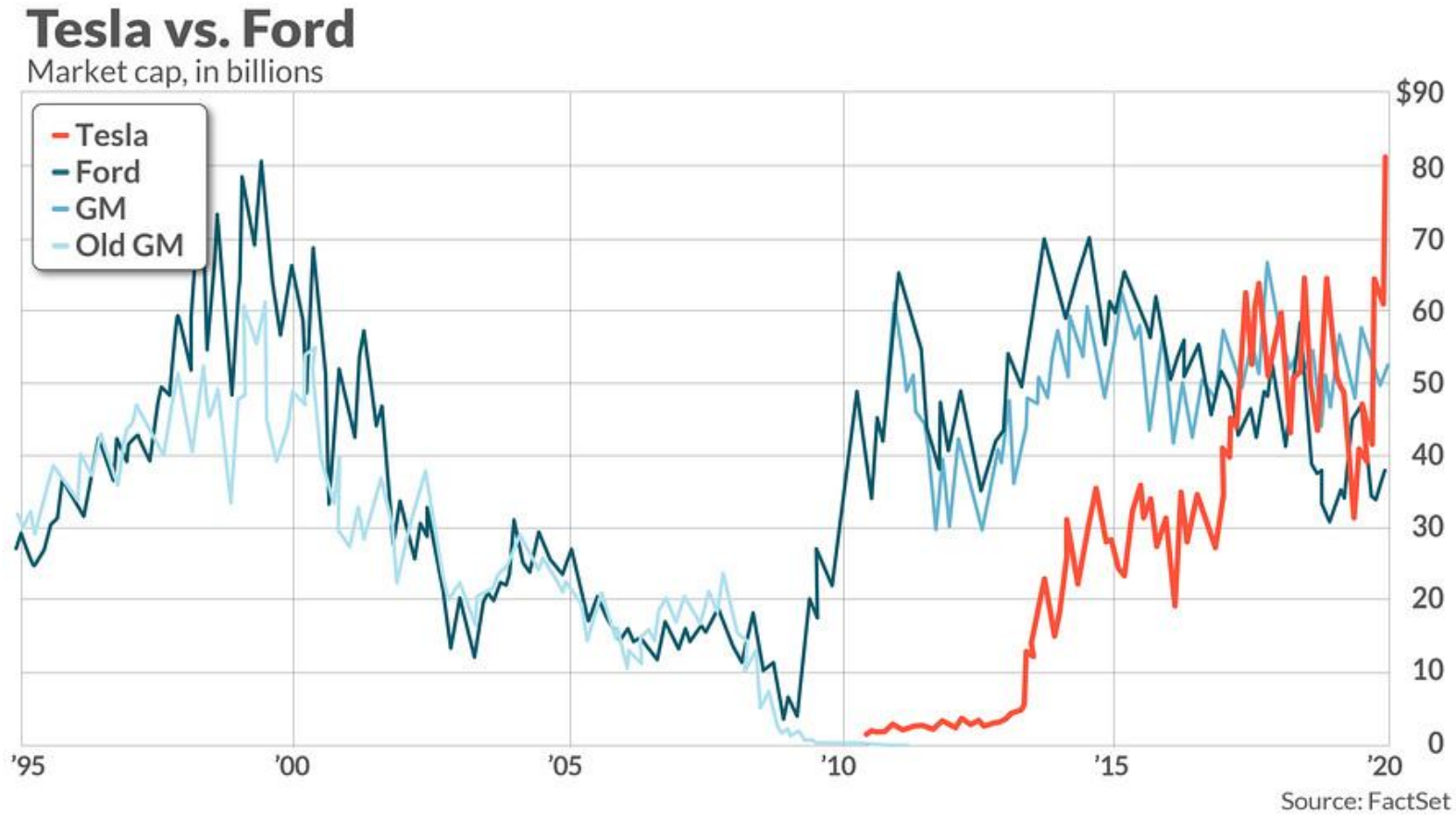
Business example

Is the proxy accurate enough? ECB asks for behavior metrics such as correlation or volatility ratio...

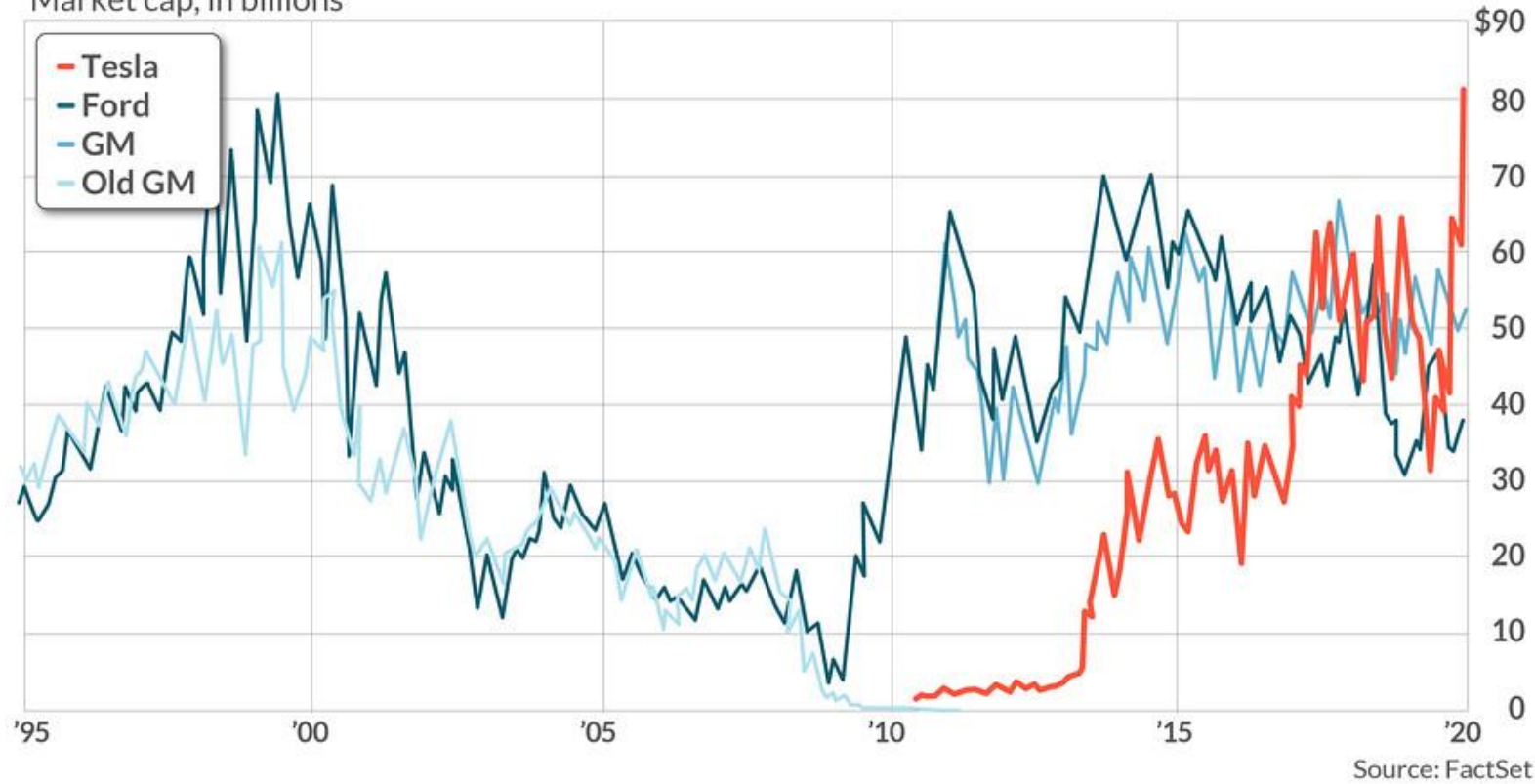
Tesla vs. Ford
Market cap, in billions

Legend:
- Tesla
- Ford
- GM
- Old GM

Source: FactSet

Business example

Could you clearly demonstrate it? ECB asks for traceability and explainability

Tesla vs. Ford
Market cap, in billions

- Tesla
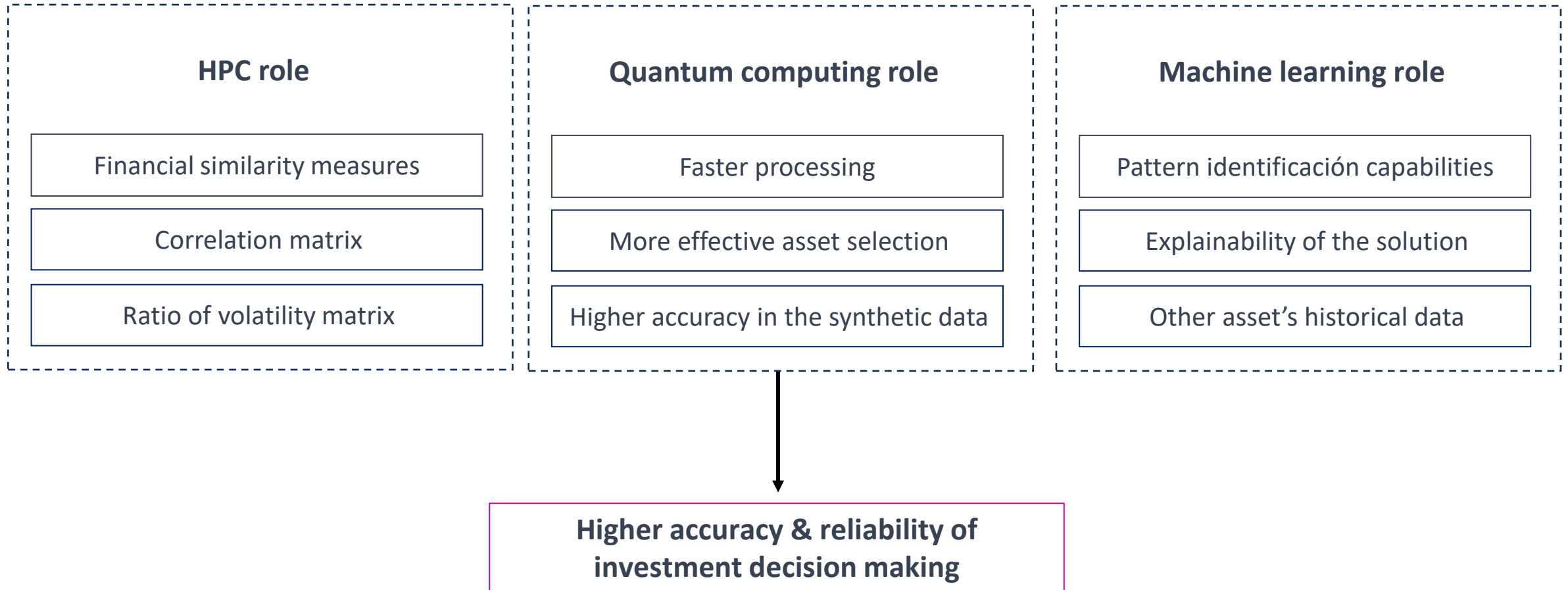- Ford
- GM
- Old GM

Source: FactSet

Solution

This groundbreaking approach confers a significant advantage, enabling financial institutions to encompass a vast universe of assets, enhancing the accuracy of data series reconstructions, the proxies.


Solution specifications:

- **Use of quantum computing**: to manage extremely large optimisation (asset selection over +10,000 assets; 10^8 correlations; +50 GB)

- **Use of machine learning**: to perform pattern detection (prediction)

- **Traceable and explainable model**: to comply with strong regulations

- **Integrable and insightful platform**: to soften decision-making and workflows

Innovation

Quantum-powered portfolio management tool that combines quantum computing and machine learning models to improve the **ACCURACY** of the proxies

HPC role

| Financial similarity measures |
| Correlation matrix |
| Ratio of volatility matrix |

Quantum computing role

| Faster processing |
| More effective asset selection |
| Higher accuracy in the synthetic data |

Machine learning role

| Pattern identificación capabilities |
| Explainability of the solution |
| Other asset's historical data |

Higher accuracy & reliability of investment decision making

Benefits

We allow financial institutions to make legal and well-informed investments. Nonetheless, benefits provide added value from 4 key perspectives

1. **Gain insights** into the **behaviour of financial instruments.** Equities, Bonds, Repurchase Agreements, Liquidity short-term rates…
2. **Obtain** information on their associated **financial metrics.** Correlation, Volatility retio, VaR, SVaR…
3. **Secure regulatory approval** for investments in these assets.
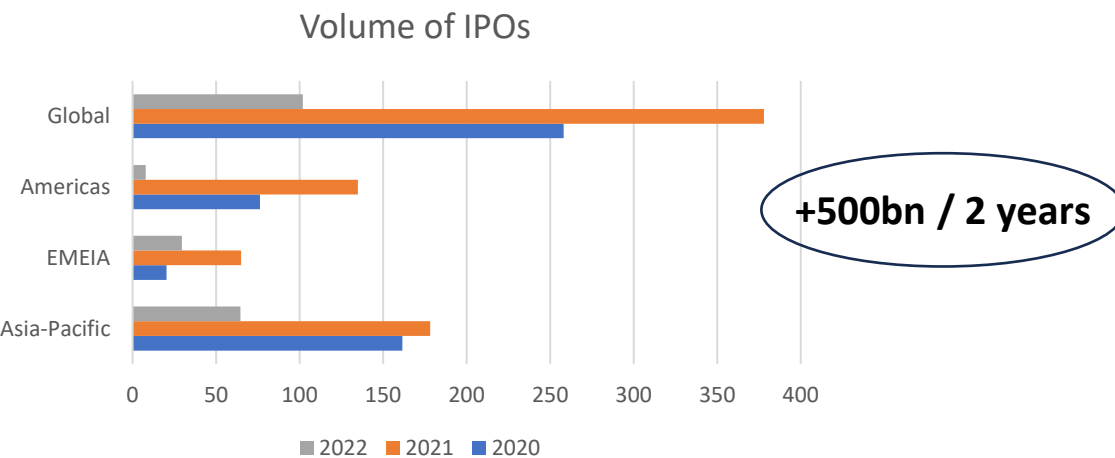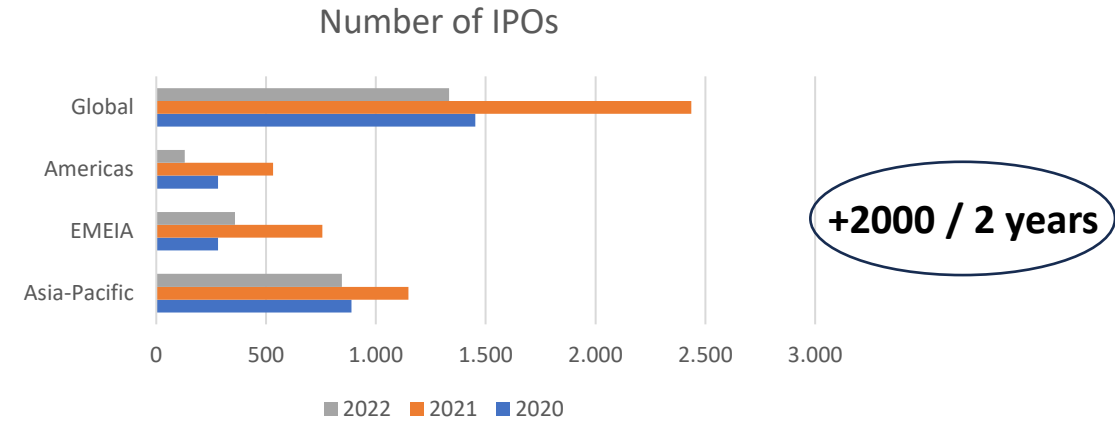4. **Eliminate cost of opportunity** regarding quantum adoption
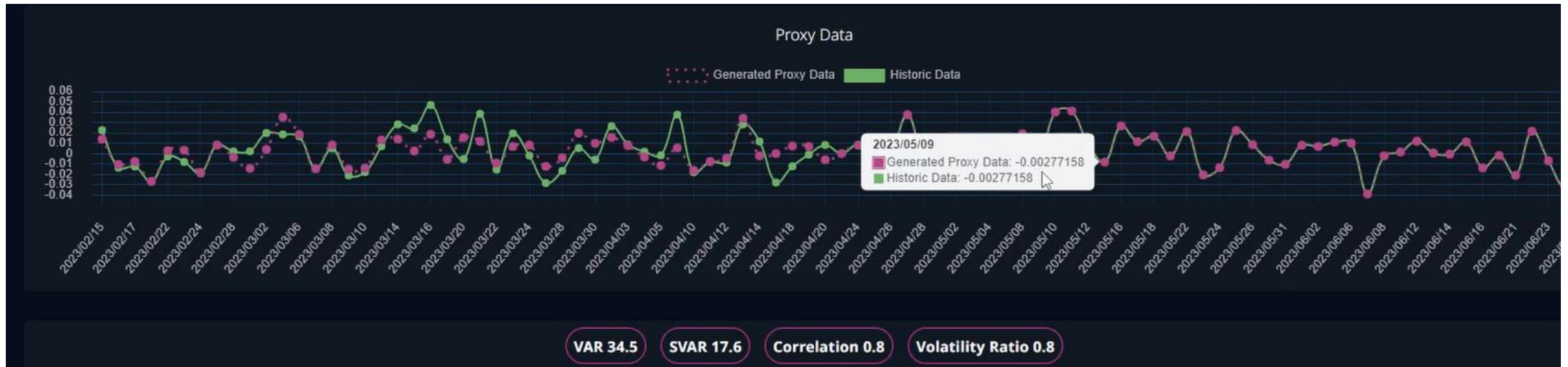
Market opportunity

We enable access to an enormous new market. Assets with less than two-year public record accounts for +2000 IPOs and $ +500 bn on average The new market opened is 20 times larger than NASDAQ.

Number of IPOs

+2000 / 2 years

Volume of IPOs

+500bn / 2 years

Market capitalization

NASDAQ

2-year public-traded companies

Financials

We have estimated in a conservative manner, taking an average low penetration in investment portfolios as well as low commission. Besides, financial information has not been considered as a monetizing option even though it is.
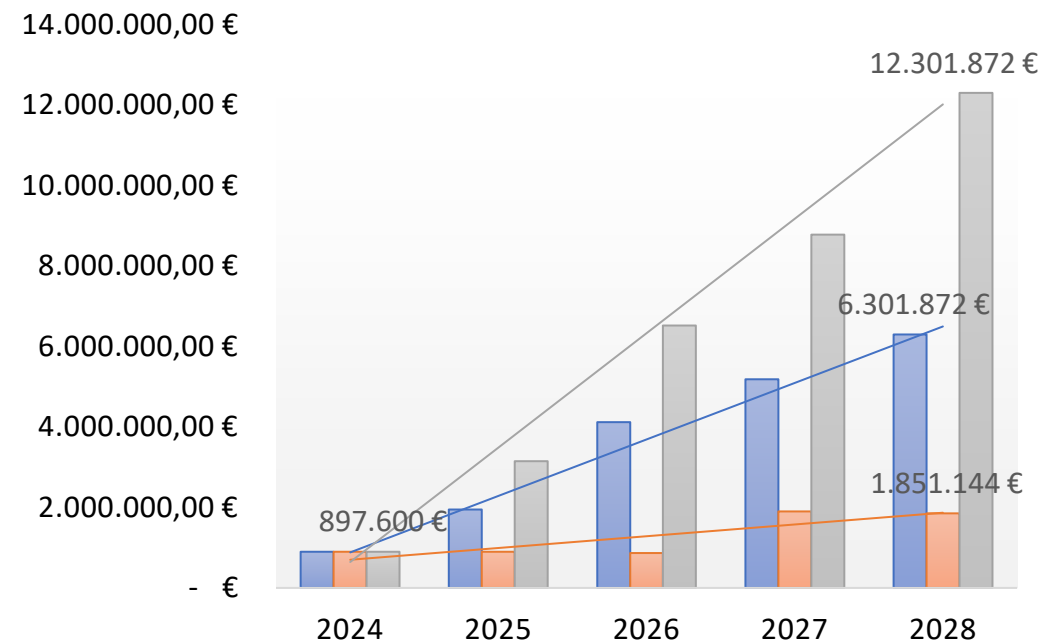
Assumptions

- Penetration in portfolios: 0.5%
- Financial institution commission: 2%
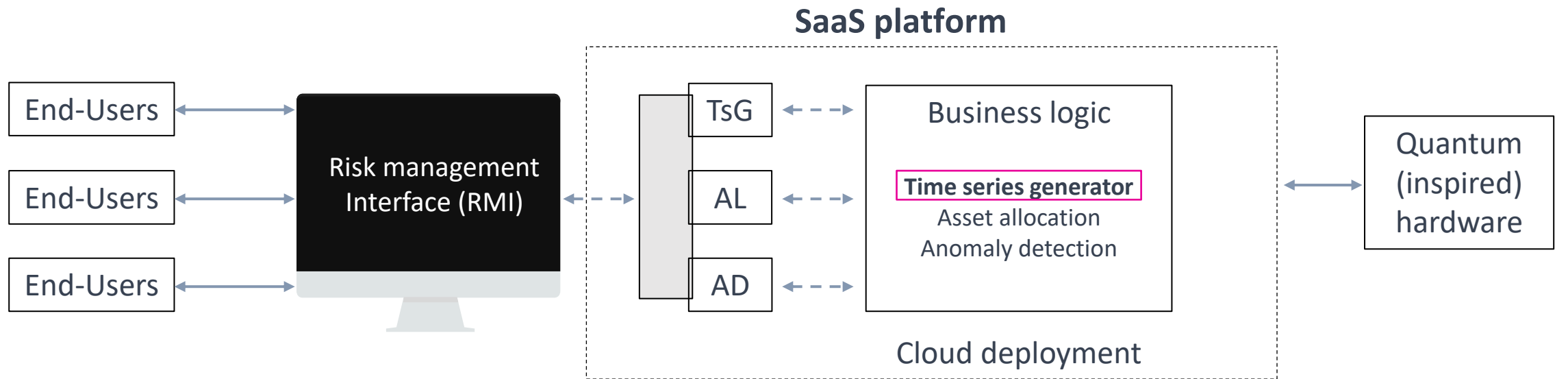- Average volume under management: DP Figures

Pricing

- Subscription-based strategy (tiered according to specific asset of interest) WPT and value perception need to be evaluated
- Commission strategies should be considered to harness scalability

EBITDA Projections

Business model

Quantum-powered SaaS embedded in a unique Risk Management platform

SaaS platform

End-Users

End-Users

End-Users

Risk management
Interface (RMI)

TsG

AL

AD

Business logic

Time series generator
Asset allocation
Anomaly detection

Cloud deployment

Quantum
(inspired)
hardware

Scalable
monetization

Licensing
flexibility

Easy
integration

Strategic
partnerships

Upselling
Services

Cross-selling
Services

Go-to-market strategy

Our go-to-market plan is focused on DP and current financial clients

Customer acquisition pipeline

1. Focus on DP to generate confidence of the industry
2. Target current clients to benefit from cross-selling. Each new service increase the switching barriers.
3. Expand to new financial institutions in the EU.

Go-to-market strategies

- Market segmentation according to asset management presence in the EU
- Free trials and inbound marketing to soften the onboarding process
- Seek for support by proposing win-win strategies with quantum-hardware providers
- Remark our regulatory compliance focus
- Track KPIs
- Prepare for scalability plan. Sustainable growth is key for customer satisfaction

Next steps & Engagement

- **Strong commitment**: Our data provider is fully dedicated to the project, demonstrating a high level of engagement.
- **Enthusiastic interest**: They are genuinely interested in extending their involvement and exploring further the capabilities of this product.
- **Active participation**: The data provider actively contributes to the project's success, making them a valuable partner for ongoing and future initiatives.

"We are fully committed and determined to keep working on this project to ensure its future success"

DP's Market Risk Director

Thank you

QUANTUM MADS

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✉ daniel@quantum-mads.com

🌐 www.quantum-mads.com

📍 c/ Uribitarte, 6 Planta 4 – 48001 Bilbao (España)