

## **CaixaBank Group, D-Wave Collaborate on Innovative New Quantum Applications for Finance Industry**

- **Leading bank in Spain becomes the first in the world to apply quantum computing in investment portfolio hedging calculation in the insurance sector.**
- **With quantum computing, CaixaBank has seen an up to 90% decrease in time-to-solution for investment portfolio hedging and portfolio optimization, among other business benefits.**

**Valencia, Spain and Burnaby, BC, Canada – 3 March 2022**

CaixaBank, the leading financial group in Spain, and D-Wave Systems Inc., a global leader in quantum computing systems, software, and services, and the only provider building both annealing and gate-model quantum computers, today announced the business results for two significant financial quantum hybrid computing applications for investment portfolio optimization and investment hedging calculation. The quantum hybrid applications have significantly decreased compute time to solve complex financial problems, improving investment portfolio optimization, increasing a bond portfolio internal rate of return (IRR), and minimizing the capital needed for hedging operations, as a result of their collaboration.

### **Quantum in Investment Portfolio Hedging and Bond Portfolio Optimization**

CaixaBank's Life insurance and Pensions company, VidaCaixa, leveraged D-Wave's Leap™ quantum cloud service and quantum hybrid solvers – which combine the strengths of classical and quantum computing – to build a quantum computing application within their investment portfolio selection and allocation, and within their portfolio hedging efforts. With this project, CaixaBank Group becomes the first known financial services company in the world to apply quantum computing in investment hedging in the insurance sector. The group is evaluating putting the application into regular production not only in VidaCaixa but in other areas in the organization, over the coming months.

The CaixaBank Group team utilized D-Wave's quantum hybrid solver services to code a faster algorithm, which markedly reduces the computing time necessary to reach an optimal solution to improve the investment portfolio hedging. What normally took the bank several hours of compute time was reduced to just minutes via quantum computing technology – an up to 90% decrease in compute time over the traditional solution. This reduction of compute

time facilitates increased modeling complexity, allowing for a more dynamic model that is better adapted to real-time markets; optimizes the invested capital while maintaining constant risk levels; and improves the hedging decision-making process.

When it comes to investment portfolio selection and allocation, the algorithm rapidly generates portfolios that can be optimized against a higher variety of constraints in a reduced timeframe. The result was a successful application which optimizes IRR by 10% in a chosen portfolio of bonds.

“We have always been an innovation-first organization, and very early on we recognized that investing in quantum computing could help us more efficiently provide state-of-the-art products and services in order to offer the best client experience. This has been the case with this proof of concept, which confirms the bank as the first one in Spain, and one of the first in the world, to incorporate quantum computing into its daily activity,” says Gonzalo Gortazar, CEO of CaixaBank. During his participation in a commissioning ceremony in Jülich, Germany, in which D-Wave announced the first Leap quantum cloud-based system outside North America at Forschungszentrum Jülich Supercomputing Centre, Gortazar confirmed CaixaBank’s commitment to continue to explore the potential of quantum computing in the financial services industry: “We are very appreciative of seeing this industry growing and maturing, and we look forward to upping our investment and our efforts in quantum, which is surely going to be transformational for our industry. We are very keen to work with D-Wave in this process.”

“Our focus has always been on the development and delivery of quantum computing for practical applications and business value,” said Alan Baratz, CEO of D-Wave. “The finance industry is undergoing massive transformation at this moment in time, which is why the industry is poised for great business benefit from quantum computing investment. CaixaBank has a clear vision for implementing market-ready quantum applications to drive efficiency, client value, and scale. We look forward to continued collaboration with them as they expand their offerings and identify additional quantum computing use-cases.”

### CaixaBank’s Quantum Journey

In 2019, CaixaBank set up a team of experts with IT technicians, mathematicians, and risk analysts dedicated to innovation in the quantum field in a multidisciplinary way, in order to explore the potential for quantum technology to enhance the bank's different capacities in diverse fields, such as risk assessment and tail risk simulators, fraud detection with artificial intelligence and machine learning, quantum safe cryptography, portfolio selection and allocation, and data mining optimization.

One of the first projects was the implementation of a quantum algorithm capable of assessing the financial risk of two portfolios created specifically for the project based on real data, one consisting of mortgages and the other, treasury bills.

In 2020, CaixaBank developed the first machine learning algorithm to classify risks in Spanish banking leveraging quantum computing. In that case, CaixaBank combined quantum computing and conventional computing in different phases of the calculation process — to classify credit risk profiles. To do this, CaixaBank used a public data set corresponding to 1,000 artificial users, with a similar profile to existing customers, but with information configured specifically for the test.

In this project, CaixaBank used the Leap quantum cloud service to access D-Wave's quantum hybrid solver service that incorporates the Advantage™ quantum computer. The cloud-access and real-time service empowers businesses like the bank and countless others across industries to solve large and complex business-scale problems. To date, D-Wave customers have built hundreds of early applications using their systems, including protein folding, financial modeling, scheduling, logistics, manufacturing optimization, machine learning, route optimization, and more. With these results, CaixaBank is working towards putting hybrid quantum applications into production.

### About CaixaBank

CaixaBank is the leading financial group in Spain. After its merger with Bankia, the bank has assets of €685.74 billion, making it Spain's largest bank, and one of the leading banks in Europe. CaixaBank also has a strong presence in Portugal, where it controls 100% of BPI.

The Group, chaired by José Ignacio Goirigolzarri and led by Gonzalo Gortázar, has around 21 million customers and the largest commercial network in Spain and Portugal, and it is a leader in digital banking with 73.1% of clients being digital.

### About D-Wave Systems Inc.

D-Wave is a leader in the development and delivery of quantum computing systems, software and services and is the world's first commercial supplier of quantum computers and the only company developing both annealing quantum computers and gate-model quantum computers. Our mission is to unlock the power of quantum computing for business and society, today. We do this by delivering customer value with practical quantum applications for problems as diverse as logistics, artificial intelligence, materials sciences, drug discovery, scheduling, cybersecurity, fault detection, and financial modeling. D-Wave's systems are being used by some of the world's most advanced organizations, including NEC Corporation, Volkswagen, DENSO, Lockheed Martin, University of Southern California, Forschungszentrum Jülich and Los Alamos National Laboratory. With headquarters near

Vancouver, Canada, D-Wave’s US operations are based in Palo Alto, CA. With headquarters and the Quantum Engineering Center of Excellence based near Vancouver, Canada, D-Wave’s U.S. operations are based in Palo Alto, Calif. D-Wave has a blue-chip investor base that includes PSP Investments, Goldman Sachs, BDC Capital, NEC Corp., Aegis Group Partners, and In-Q-Tel.

D-Wave announced in February it has entered into a definitive merger agreement with DPCM Capital, Inc. (“DPCM Capital”) (NYSE:XPOA), a publicly traded special purpose acquisition company. Upon closing of the transaction, shares of D-Wave Quantum Inc., a newly formed parent company of D-Wave and DPCM Capital, are expected to trade on the NYSE under the symbol “QBTS.” Learn more at [www.dwavesys.com/investors](http://www.dwavesys.com/investors).