Danske Markets

Quantitative Research in Danske Bank

Danske Bank

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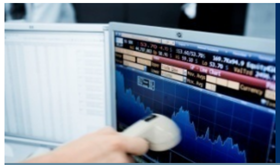
What we do

THE “QUANT” DEPARTMENT

What is a quant

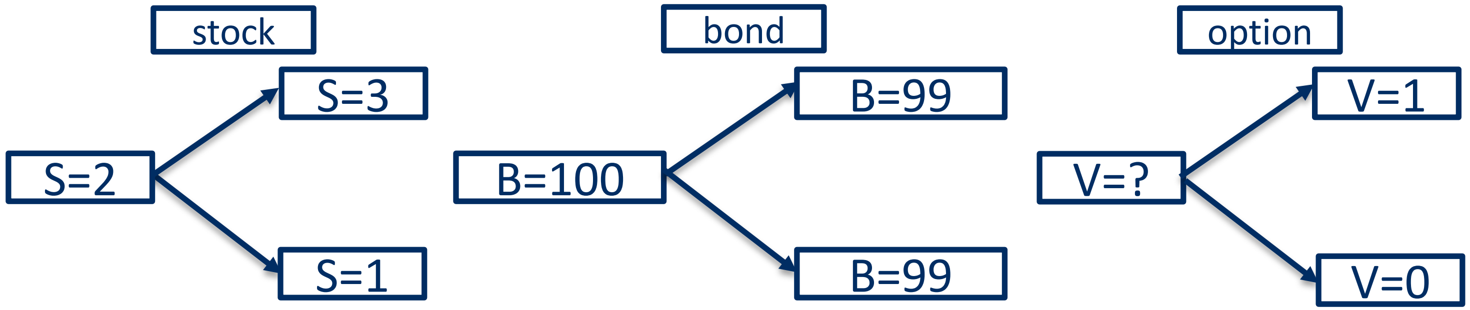
- “A **quantitative analyst** (or, in financial jargon, a **quant**) is a person who specializes in the application of mathematical and statistical methods – such as numerical or quantitative techniques – to financial and risk management problems.” from Wikipedia



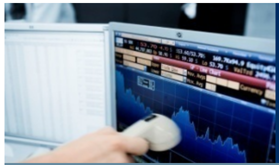
Quantitative Research in Danske Bank

- In short: We do the difficult calculations
- A bit longer: We develop a pricing/risk engine for financial contracts called SuperFly,
- The calculations on the bank's portfolio (derivatives, bonds, loans etc) are (all including advanced math and numerics, stochastic differential equations, optimizations, closed form solutions/approximations etc):
  - Present fair value
  - Risk and scenarios
  - And much more

Gold price today is 100, and the interest rate is 10% per year, what would you sell me a forward contract for gold in one year?

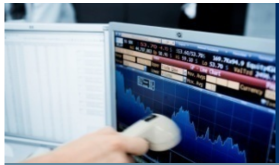


Option value,V, is found by replication in the underlying stock and bond, i.e. two equations with two unknowns



Quantitative Research in Danske Bank

- SuperFly is a c++ library consisting of about 1 million code lines
- The whole life cycle is taken care of:
  - Mathematical formulation of the pricing models and other tools
  - Implementation in c++
  - Implementation and support on the trading and sales desks
- SuperFly core is developed and supported by about 40 people, plus an IT infrastructure department of about 50 people
- About 50% have a PhD in physics or mathematics or engineering or, of course, finance. Currently 10 nations are represented in the quant department and including IT, we are 15 nations represented



Quantitative Research in Danske Bank

- We present our research frequently at scientific conferences
- Some academic achievements
  - A new pricing model/volatility surface interpolation for European options. Jesper Andreasen and Brian Huge won the Quant of the year Award for: *"…The pair turned conventional approaches on their head, to the bafflement of their colleagues in the quant community, with some highly original thinking on the subject of implied volatility calibration…"*
  - The new challenges for quantitative research are regulations, capital costs etc and Quantitative Research again won an award for CVA system of the year (*JP to Leif Andersen: ".. so I hear that BAML runs their CVA on a farm of 20,000 computers -- at Danske we use an iPad mini…")*