ON BECOMING A QUANT

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What does a quant do?

A quant designs and implements mathematical models for the pricing of derivatives.

What sorts of quants are there?

(1) Front office/desk quant
(2) Model validating quant
(3) Research quant
(4) Quant developer

A desk quant implements pricing models directly used by traders. Main plusses close to the money and opportunities to move into trading. Minuses can be stressful and depending on the outfit may not involve much research.

A model validation quant independently implements pricing models in order to check that front office models are correct. Plusses more relaxed, less stressful. Minusses model validation teams can be uninspired and far from the money.

Research quant tries to invent new pricing approaches and sometimes carries out blue-sky research. Plusses it's interesting and you learn a lot more. Minusses sometimes hard to justify your existence.

Quant developer – a glorified programmer but well-paid and easy to find a job.

All forms of quants spend a large amount (i.e. more than half) their time programming. However, implementing new models is interesting in itself. The standard programming approach is object-oriented C++. A wannabe quant must learn C++.

In the UK standard sources for job adverts are www.jobserve.com search under "quant", the FT appointments section on a Thursday, and www.wilmott.com has a jobs board. A lot of adverts are from recruitment consultants rather than from banks. It's important to realize that the job may not even exist – the consultant wants to get

decent candidates that he can then try to place them in banks. The consultant gets a commission from the bank if he can place you. They tend to have short attention spans. If you do well at the first couple of interviews then they will work hard to get you a good job but if you don't they will quickly lose interest. Also, be aware their agenda is to get a good commission rather than to help you so they will push you at jobs on that basis.

In fact, going via a recruitment consultant is the standard way to get a job. Quants are generally not hired as a part of the on campus recruitment process but instead hired as they are needed by the team. Because of this it's not a great idea to start applying a long time before you want to start. Obviously personal contacts should be exploited as much as possible. Banks tend not to be into paying expenses for interviews. One therefore needs to go to London or New York and attempt to get as many interviews as possible as quickly as possible.

What should one learn? Standard books are

- Hull - Options future and other derivatives – comprehensive but low level mathematically and can be frustrating for pure mathematicians
- Baxter and Rennie – accessible introduction to martingale approach but oriented towards theory rather than practicalitues
- Wilmott (Derivatives) – good on the PDE approach but not so good on other approaches.

My book will be published in early 2003 and I like it, of course.

Stochastic calculus is useful but not as important as it at first appears. Standard texts are Oksendal, and Karatzas and Shreve. It's hard to find the time to pick it up on the job so it's worth learning in advance. It's also worth spending some time going over basic probability theory – eg Chung's books.

Interviewers tend to care more about understanding the basics well than on knowing a lot. It's also important to demonstrate genuine interest in the field. Read the Economist and the FT or Wall Street Journal comprehensively. It's not unusual to ask basic calculus or analysis questions e.g. what is the integral of log x. Asking for a derivation of the Black-Scholes equation is very common too. They always ask you to explain your thesis so be prepared to be able to do this.

Generally, a PhD (or almost a PhD) is a necessity to get a quant job. I would advise against starting before it's awarded as it tends to be hard to get it done whilst doing a busy job.

The main challenge for a pure mathematician is to be able to get one's hands dirty and learning to be more focussed on getting numeric results than on fancy theories. The main way to do this is to implement pricing models for practice. If this doesn't appeal you aren't suited to being a quant. There are quite a few ex-pure mathematicians working in the city so it can certainly be done but there is some prejudice towards applied maths and physics people.

How much does a quant earn? A quant with no experience will generally get between 35 and 50k pounds. This will generally go up fairly rapidly. Bonuses are generally a large component of total salary.

How hard does a quant work? This varies a lot. At RBS we get in between 8.30 and 9 and go home around 6pm. The pressure varies. Some of the American banks expect much longer hours. Wall St tends to be more demanding than the City. In London 5 to 6 weeks holidays is standard. In the US 2 to 3 is standard.