

It's all Greeks to me

Emanuel Derman reports on a quant who made good

Recently, I received the letter reprinted below.

Dear Mr Derman,
You are always writing about the difficulty of being a good quant, but it's not that hard. Read please my story and don't be so serious!

I have come to New York with a PhD from *****. Quickly, I answered an internet ad by a *chasseur de tête* who sent me to a foreign bank. Two interviews and I aced them all. A week later, I'm on the desk. "Dude, you are getting a Dell!" I say to myself.

With my scientific PhD, I find option theory easy as π . I have studied heat conduction and quantum mechanics so I quickly comprehend the options: α is intercept, β slope, Γ curvature, Δ tangent, σ temperature, θ sensitivity, μ drift. If I know derivatives, I know Derivatives. Soon I am an expert at Black-Scholes and Beyond. Yield curves are strings. Feynman to me? Kaç to you! Everything's an option. I am one dynamic hedger, man.

On the prop desk my boss is Alden, an MBA, and I'm his quantitative guy. He calls me a geek; he knows no math but he sure knows business; he can use the same word as noun, adjective, exclamation and gerund in single sentence when he's angry. Alden's risqué assistant is Lidia, a truly exotic option, a total knock-out with a

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non-normal distribution which makes the option salesman whistle and mutter softly about barrier penetration.

I have rational expectations for Lidia but I feel she don't respect me. She like old movies but has no taste for mathematics and its beauty. To her I am far out-of-the-money.

Now the bank wants to do structured products. I have Excel, I buy VBA, I get models from *optionmodels.com* and now I'm in business. We're doing long-term puts and calls, down-and-outs, converts, one-touches, spread options, CDS, vol swaptions, whatever, and I'm getting all the prices. I find model for anything. Easy as Dell. Once a week we run my spreadsheet to mark the

book. Big P&L fast. Then late dinner with Alden at Bouley or Jean-Georges.

But always Lidia's on my mind. When I watch her wandering across the floor, I cannot but think of excess kurtosis. I try to cliquet with her for coffee but she DK my trade. I sense there is little chance of a transformation between her p-measure and my q-measure.

One day someone offer Alden a big position in spread option barrier reversal American no-touch interest rate euro swaptions, denominated in Turkish lira. According to my model, these Sobranies are pretty cheap. Lots of α , high κ , big Sharpe. Alden take \$100 million face for the desk and his boss bought some for his own PA too.

Next day the broker offered us much more at the same price – great deal! Each day's close I tell Alden how my model says to re hedge the Eurodollar futures and the lira, and then we execute. Except I am always thinking sadly about Lidia, dreaming of her capital assets. Will I ever know her efficient frontier?

Next week comes by the head of model risk, ENS graduate Dr Jean-Martin Geille, an expert in Malliavin calculus. And Vlad, chief risk modeller.

"You're VAR is way up, mon ami," said J-M to Alden, very loud. "What model 'ave you used for the Sobranies?"

My model is one-factor Monte Carlo with control variate, \$125 from the web. Vlad's is three-factor Crank-Nicolson PDE with fat tails and LU decomposition, he tells me, written in Java on his Linux laptop. His say we have a lot less α than mine.

"You pay too much μ for too little κ !" say Vlad.

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But J-M does. "I am arrestin' you for ze future mis-markin' of complex instruments," he yells, waving his hands as he jumps in front of Alden. He joke, but Alden doesn't laugh. He knows J-M would do anything to make risk department look



good. We are ϵ away from big trouble.

That night the risk committee uses Vlad's model. Their report shows big drop in our marks. "No-one knows what this is really worth," moans Alden. "We'd better unwind and cut our losses. No Zermatt this Xmas ..." Bonus day is only a month away.

So much volatility is difficult to concentrate... At the close I execute the end-of-day Eurodollar hedge and leave lira rebalancing for next morning.

When I get to work Alden is popping.

"Did you hedge last night?" he yell.

"Eurodollars yes, lira no!" I say.

"Great!" shout Alden. "Trouble in the Middle East – 7 percentage point drop in the Turkish lira overnight. The Sobranies knocked in. How'd you guess?"

"I been learning extreme value theory," I tell Alden.

"Good call, guy!" he say as he squeeze my shoulder.

The Sobranies triple and we close out. I make 20 units for the desk.

Lidia looks at me with new respect. On bonus day I invite her to dinner at Jean-Georges.

"How did you do it?" she smile at me over the Petrus '85.

I can see our implied correlation is approaching unity and I am ready to early exercise.

"Behavioural finance," I tell Lidia as I take her hand. "The market is like a shy woman who suddenly find she's beautiful: slow to passion but fiery when aroused..."

Soon perhaps I start my own market-neutral hedge fund, offshore. Meanwhile, I hope my story encourage your readers.

Yours,

D***** B*****

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